Government Bikram College of Commerce

Patiala-147001

Link to the Uploaded Papers, the First Page/full Paper(with author and affiliation details)

Website: www.gbcpatiala.ac.in

Mail ID: gbcpatiala1@gmail.com

A novel hybrid hypervolume indicator and reference vector adaptation strategies based evolutionary algorithm for many-objective optimization

Authors

Gaurav Dhiman, Mukesh Soni, Hari Mohan Pandey, Adam Slowik, Harsimran Kaur

Publication date

2021/10

Journal

Engineering with Computers

Volume

37

Pages

3017-3035

Publisher

Springer London

Description

A novel hybrid many-objective evolutionary algorithm called Reference vector guided Evolutionary Algorithm based on hypervolume indicator (H-RVEA) is proposed in this paper. The reference vectors are used in a number of sub-problems to

161

Engineering Applications of Artificial Intelligence

Volume 96, November 2020, 104008

MOEPO: A novel Multi-objective Emperor Penguin Optimizer for global optimization: Special application in ranking of cloud service providers

Harsimran Kaur [a], Anurag Rai [b], Sarvjit Singh Bhatia [c], Gaurav Dhiman [d]

Hindawi

Wireless Communications and Mobile Computing

160

Special Issue

AI-Based Federated Learning for 6G Mobile Networks

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 5543720 | https://doi.org/10.1155/2021/5543720

Show citation

Multimedia Concepts on Object Detection and Recognition with F1 Car Simulation Using Convolutional Layers

Amutha Balakrishnan,[1] Kadiyala Ramana,[2] Gaurav Dhiman,[3] Gokul Ashok,[1] Vidhyacharan Bhaskar,[4] Ashutosh Sharma,[5] Gurjot Singh Gaba,[6] **Mehedi Masud**,[7] and Jehad F. Al-Amri[8]

Show more

Academic Editor: Dafeng Hong

Published: 09 Dec 2021

Abstract

This paper presents a framework for detecting objects in images based on global features and contours. The first step is a shape matching algorithm that uses the background subtraction process. Object detection is accomplished by an examination of the oversegmentation of the image, where the space of the potential boundary of the object is examined to identify boundaries that have a direct resemblance to the prototype of the object type to be detected. Our analysis method removes edges using bilinear interpolation and reestablishes color sensors as lines and retracts background lines from the previous frame. Object contours are generated with clustered lines. The objects detected will then be recognized using the extraction technique. Here, we analyze the color and shape characteristics with which each object is capable of managing occlusion and interference. As an extension of object detection and recognition, F1 car simulation is experimented with simulation using various layers, such as layer drops, convolutionary layers, and boundary elimination, avoiding obstacles in different pathways.

1. Introduction

Object detection is the primary functionality needed by most computer and robot vision systems. The new study of this field has advanced significantly in many respects. Computer vision technology has rapidly and effectively developed. These results have been achieved with computer vision methods and with the development of new representations and models for computer vision issues. In machine vision, we have seen great progress. It includes the details of object detection science. To detect objects, the system tracks objects in a scene and organises them into categories. The purpose of an object detector is to detect objects regardless of size, location, position, view with respect to the camera, partial occlusion, and illumination conditions.

Object detection is the first task of many computer vision systems to learn more about the object. Once a face

Hindawi

Mobile Information Systems

159

Special Issue

Machine Learning, Deep Learning and Optimization Techniques for Heterogeneous Sensor Information Integration

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 4912486 | https://doi.org/10.1155/2021/4912486

Show citation

Computer Vision-Enabled Character Recognition of Hand Gestures for Patients with Hearing and Speaking Disability

Sapna Juneja,[1] Abhinav Juneja,[1] Gaurav Dhiman ,[2] Shashank Jain,[3] Anu Dhankhar,[4] and **Sandeep Kautish** [5]

Show more

Academic Editor: Xingsi Xue

Published: 14 Dec 2021

Abstract

Hand gesture recognition is one of the most sought technologies in the field of machine learning and computer vision. There has been an unprecedented demand for applications through which one can detect the hand signs for deaf people and people who use sign language to communicate, thereby detecting hand signs and correspondingly predicting the next word or recommending the word that may be most appropriate, followed by producing the word that the deaf people and people who use sign language to communicate want to say. This article presents an approach to develop such a system by that we can determine the most appropriate character from the sign that is being shown by the user or the person to the system. To enable pattern recognition, various machine learning techniques have been explored and we have used the CNN networks as a reliable solution in our context. The creation of such a system involves several convolution layers through which features have been captured layer by layer. The gathered features from the image are further used for training the model. The trained model efficiently predicts the most appropriate character in response to the sign exposed to the model. Thereafter, the predicted character is used to predict further words from it according to the recommendation system used in this case. The proposed system attains a prediction accuracy of 91.07%.

1. Introduction

Machine learning [1] has changed the dimensions of how society thinks and perceives the world. There is a multidimensional growth in the range of applications [2] that are being supported by machine learning. All the three forms of machine learning including supervised, unsupervised, and reinforcement learning have been finding their solicitations in newer ways, affecting human lives and giving an all-new shape to how modern-day businesses are carried out. Among the various application of machine learning, computer vision is one area that is attracting the research community to harness the potential of technological developments

158

Article

Comparison of Fundamental Learning Strategies for CBIR using Deep Learning Methods

January 2021 · Recent Advances in Electrical & Electronic Engineering (Formerly Recent Patents on Electrical & Electronic Engineering) 14
DOI:10.2174/2352096514999210128195839

Authors:

Meenakshi Garg

Manisha Malhotra
Chandigarh University, Gharuan, Mohali, India

Harpal Singh
Chandigarh Engineering College

Abstract

Background Photo retrieval based on contents is primarily used to retrieve photographs from a broad database. CBIR, also named "search by image," is an al-lowing technology that handles computerized images by its recognizable attributes. Methods In other words, CBIR is a method for recovery of images that does not rely on annotations or keywords but on the characteristics of the images directly taken from the pictures. CBIR systems rely on the use of machine display methods in broad datasets for the image retrieval issue. The CBIR technology is the retrieval from a cluster of photos or archive of the most visually similar photographs to a particular query file.It is really useful for scanning photos, medical research etc. in other fields such as photography. It may be hard to visually find the images by inserting the metadata or keywords into a large database and cannot catch the keyword for identifying this image. CBIR allows the extraction of similar photographs from a digital archive with no labeling of photographs. The Deep Neural Network and Neuro-Fuzzy classification are contrasted in this article. They both have numerous findings and numerous tests to forecast the picture. Results The analysis of the neuro-fuzzy and deep neural network methods we suggest reveals that the precision is increased. Conclusion Accuracy values for DNN and Neuro-Fuzzy Classifier process are74.6% and 75.4%. For the validity of the proposed process, the visual and qualitative findings are provided.

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

Original Article | Published: 09 September 2020

157

EMoSOA: a new evolutionary multi-objective seagull optimization algorithm for global optimization

Gaurav Dhiman ✉, Krishna Kant Singh, Adam Slowik, Victor Chang, Ali Riza Yildiz, Amandeep Kaur & Meenakshi Garg

International Journal of Machine Learning and Cybernetics
12, 571–596 (2021)

Abstract

This study introduces the evolutionary multi-objective version of seagull optimization algorithm (*SOA*), entitled Evolutionary Multi-objective Seagull Optimization Algorithm (*EMoSOA*). In this algorithm, a dynamic archive concept, grid mechanism, leader selection, and genetic operators are employed with the capability to cache the solutions from the non-dominated *Pareto*. The roulette-wheel method is employed to find the appropriate archived solutions. The proposed algorithm is tested and compared with state-of-the-art metaheuristic algorithms over twenty-four standard benchmark test functions. Four real-world engineering design problems are validated using proposed *EMoSOA* algorithm to determine its adequacy. The findings of empirical research indicate that the proposed algorithm is better than other algorithms. It also takes into account those optimal solutions from the *Pareto* which shows high convergence.

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

IQAC
Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

156

A Novel Machine-Learning Framework-based on LBP and GLCM Approaches for CBIR System

Meenakshi Garg[1], Manisha Malhotra[1], and Harpal Singh[2]
[1]University Institute of Computing, Chandigarh University, India
[2]Department of Electronics and Communication Engineering, CEC Landran, India

Abstract: *This paper presents a Multiple-features extraction and reduction-based approaches for Content-Based Image Retrieval (CBIR). Discrete Wavelet Transforms (DWT) on colored channels is used to decompose the image at multiple stages. The Gray Level Co-occurrence Matrix (GLCM) concept is used to extract statistical characteristics for texture image classification. The definition of shared knowledge is used to classify the most common features for all COREL dataset groups. These are also fed into a feature selector based on the particle swarm optimization which reduces the number of features that can be used during the classification stage. Three classifiers, called the Support Vector Machine (SVM), K-Nearest Neighbor (KNN) and Decision Tree (DT), are trained and tested, in which SVM give high classification accuracy and precise rates. In several of the COREL dataset types, experimental findings have demonstrated above 94 percent precision and 0.80 to 0.90 precision values.*

Keywords: *CBIR, DWT, SHO, feature selection, classification.*

Received November 18, 2019; accepted July 20, 2020
https://doi.org/10.34028/iajit/18/3/5

1. Introduction

Content-Based Image Retrieval (CBIR) is the most important field of computer vision and image processing. It is used in different fields, such as medicine, health, cultural heritage, prevention of crime, etc. Based on its visual content, the CBIR is a well-defined searching and recovery technique in a broad dataset. The recovery of images is characterized by local or global visual content characteristics. The characteristics of the images, such as color, shape and texture, describe global characteristics [41]. Color is a common visual function used in CBIR and is primarily studied in literature (see Figure 1). The main goal is for people, particularly in color lines, to distinguish pictures [47]. Texture is also an important aspect of image surfaces and is characterized by visual patterns similarity, reflecting the most significant details on the image surface as bricks, carvings, clouds etc., These descriptors are also suitable for medical pictures recovery. The type descriptors do not imply that the entire picture is described, but rather, that the structure of the specific part of an image is described. In order to identify and classify object categories and collect points of concern and areas, local image characteristics were used effectively. Since, the 1990s images recovery from datasets have become a particularly dynamic research topic with visual content. Nonetheless, the semanticized dimension of images, which comprises the fundamental semantic difference between device results and user experience, is still not sufficiently considered in most trials. First, of all, an image element is extracted and features are picked. The second is the estimation of the similarity measures [42]. Eventually, function indexing and recovery is carried out. The way the characteristics are extracted and picked depends on the area of the image or the whole image. Descriptors are often evaluated by using the spatial information texture, shape and colors etc., The use of local descriptors has increased in recent years since they continue to be used in similar ways, as the local descriptors are extracted from the areas of the image, rather than from the whole image. In addition, local descriptors are extracted from the image in which the Scale Invariant Feature Transform (SIFT) [34], Speeded Up Robust Features (SURF) [4], Histogram of Oriented Gradient (HoD) [9] and Local-Binary patterns [39] are used specifically for CBIR. In addition to these LBP versions, the traditional Local Binary Patterns [44] were proposed as an efficient version of these DFLs. The calculation of similitude is the second and major phase of the CBIR models. It attempts to reduce the semantine difference [19]. In the first few years of the CBIR, the focus was put on the various similarity measures required for each particular function. For calculation of the resemblance between image descriptors, similarity measures such as Mahalanob is and Euclidean distances are used. Instead of calculating the recent use of similarities [34], learning of similarities has become popular [10]. However, in modern research for CBIR machine learning is becoming popular [35].

By taking large datasets for training [12, 40], the system efficiency could be improved. Synthetic

Original Article | Published: 06 June 2020

155

A novel content-based image retrieval approach for classification using GLCM features and texture fused LBP variants

Meenakshi Garg & Gaurav Dhiman

Neural Computing and Applications **33**, 1311–1328 (2021)

Abstract

This paper presents a content-based image retrieval technique that focuses on extraction and reduction in multiple features. To obtain multi-level decomposition of the image by extracting approximation and correct coefficients, discrete wavelet transformation is applied to the *RGB* channels initially. Therefore, both approximation and correct coefficients are applied to the dominant rotated local binary pattern termed as texture descriptor which is computationally effective and rotationally invariant. For a local neighbor patch, a rotation invariance function image is obtained by measuring the descriptor relative to the reference. The proposed approach contains the complete structural information extracted from the local binary patterns and also extracts the additional information using the information of magnitude, thereby achieving extra discriminative power. Then, *GLCM* description is used by obtaining the dominant rotated local binary pattern image to extract the statistical characteristics for texture image classification. The proposed technique is applied to CORAL dataset with the help of particle swarm optimization-based feature selector to minimize the number of features that can be used during the

Journal of Ambient Intelligence and Humanized Computing
https://doi.org/10.1007/s12652-020-02580-0

ORIGINAL RESEARCH

A novel algorithm for global optimization: Rat Swarm Optimizer

Gaurav Dhiman[1] · Meenakshi Garg[1] · Atulya Nagar[2] · Vijay Kumar[3] · Mohammad Dehghani[4]

Received: 9 August 2019 / Accepted: 27 September 2020

Abstract
This paper presents a novel bio-inspired optimization algorithm called Rat Swarm Optimizer (RSO) for solving the challenging optimization problems. The main inspiration of this optimizer is the chasing and attacking behaviors of rats in nature. This paper mathematically models these behaviors and benchmarks on a set of 38 test problems to ensure its applicability on different regions of search space. The RSO algorithm is compared with eight well-known optimization algorithms to validate its performance. It is then employed on six real-life constrained engineering design problems. The convergence and computational analysis are also investigated to test exploration, exploitation, and local optima avoidance of proposed algorithm. The experimental results reveal that the proposed RSO algorithm is highly effective in solving real world optimization problems as compared to other well-known optimization algorithms. Note that the source codes of the proposed technique are available at: http://www.dhimangaurav.com.

Keywords Optimization · Metaheuristics · Swarm-intelligence · Benchmark test functions · Engineering design problems

1 Introduction

For real world problems, stochastic optimization methods have been employed for solving various combinatorial problems. These optimization problems are non-linear, multimodal, computationally expensive, and possess large solution spaces to solve traditional methods (Kaur et al. 2017, 2019, n.d., Kaur 2019; Kaur et al. 2019; Dhiman and Kumar 2017; Singh and Dhiman 2018a; Dhiman and Kumar 2018c; Singh and Dhiman 2018b). Metaheuristic algorithms are able to solve such complex problems (Che et al. 2019; Dhiman and Kumar 2018b; Dhiman and Kaur 2018; Singh et al. 2018a, b; Dhiman and Kumar 2018a; Kaur et al. 2018; Li et al. 2019; Asghari et al. 2020; Ramirez-Atencia and Camacho 2019) in a reasonable amount of time. Nowadays, there has been a lot of interest to develop metaheuristic optimization algorithms (Dhiman et al. 2018; Dhiman and Kumar 2019a, b; Dhiman and Kaur 2019b; Dhiman et al. 2019; Dhiman 2019a, b, c; Singh et al. 2019; Dehghani et al. 2019; Maini and Dhiman 2018; Pallavi and Dhiman 2018; Garg and Dhiman 2020; Kaur et al. 2020) which are computationally inexpensive, flexible, and gradient free (Ragmani et al. 2019; Yang et al. 2020; Balasubramanian and Marichamy 2020). These techniques have been classified into three categories (Dhiman et al. 2020b; Dehghani et al. 2020; Chandrawat et al. 2017; Singh and Dhiman 2017; Dhiman and Kaur 2017, 2019a; Verma et al. 2018; Kaur and Dhiman 2019; Dhiman and Kumar 2019c): Evolutionary based, Physical based, and Swarm-intelligence based algorithms.

Evolutionary based algorithms mimic the evolutionary processes in nature such as reproduction, mutation, recombination, and selection. These algorithms are based on the

✉ Gaurav Dhiman
gdhiman0001@gmail.com

Meenakshi Garg
meenagarg82@gmail.com

Atulya Nagar
atulya.nagar@hope.ac.uk

Vijay Kumar
vijaykumarchahar@gmail.com

Mohammad Dehghani
adanbax@gmail.com

[1] Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab 147001, India

[2] Faculty of Science, Liverpool Hope University, Hope Park, Liverpool L16 9JD, UK

[3] Department of Computer Science and Engineering, National Institute of Technology, Hamirpur, Himachal Pradesh 177001, India

[4] Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, Iran

Published online: 06 October 2020

Methodologies and Application | Published: 13 June 2020

153

MoSSE: a novel hybrid multi-objective meta-heuristic algorithm for engineering design problems

Gaurav Dhiman & Meenakshi Garg

Soft Computing **24**, 18379–18398 (2020)

Abstract

This paper introduces a novel hybrid optimization algorithm called *MoSSE* by combining the features of Multi-objective Spotted Hyena Optimizer (*MOSHO*), Salp Swarm Algorithm (*SSA*), and Emperor Penguin Optimizer (EPO). *MoSSE* uses *MOSHO's* searching capabilities to effectively discover the search space, *SSA's* leading and selection process to achieve the fittest global solution with quicker convergence technique, and *EPO's* effective mover technique for better adjustment of the next solution. The algorithm is tested on ten *IEEE CEC-9* standard test functions and compared with seven well-known multi-objective optimization algorithms according to their performance. The experimental results show that *MoSSE* provides highly competitive outcomes in terms of convergence speed, searchability, and accuracy. Statistical testing is also performed on *IEEE CEC-9* test functions. Four performance metrics (i.e., Hypervolume, Δ_p, Spread, and Epsilon) are used to validate the searching capability of the proposed algorithm. *MoSSE* is further applied to welded beam, multi-disk clutch brake, pressure vessel, 25-bar truss design problems to test its effectiveness. The findings show the utility of the proposed algorithm to resolve the real-life complex

152

Deep Convolution Neural Network Approach for Defect Inspection of Textured Surfaces

Meenakshi Garg[1], Gaurav Dhiman[2,]*

Corresponding Author:
Gaurav Dhiman

Affiliation(s):
1. Department of Computer Science, Government Bikram College of Commerce, Patiala 147004, Punjab, India
Email: meenagarg82@gmail.com
2. Department of Computer Science, Government Bikram College of Commerce, Patiala 147004, Punjab, India
Email: gdhiman0001@gmail.com
*Corresponding Author: Gaurav Dhiman, Email: gdhiman0001@gmail.com

Abstract:
Defect Inspection of Textured Surfaces is a challenging problem which occurs during manufacturing in many processing phases. With arbitrary length, shape and orientation, these defects occur. Moreover, there are fewer and different photos of defective products. Deep Convolution Neural Network (CNN) has an impressive development in target detection, and better results have been obtained with the implementation of deep CNN design for texture detection. Nonetheless, with the growing detection accuracy of deep CNNs, there are the drawbacks of significantly increasing computational costs and processing resources, which seriously hinders CNN's use in resource-limited environments such as mobile or embedded phones. In this paper, a novel framework is proposed that uses raw image database patch statistics joint with two layers of neural network for surface defect detection. For defect detection, a convolution neural network (CNN) classifier is used. Imaging analysis of training samples using Deep Convolution Neural Network (CNN) is used to find the defect in an image's target area. In point of energy saving, the results of the experiment show that proposed method has numerous advantages in terms of reduction in time and cost. It also shows the high-performance contrast to conventional manual inspection process with less repetition and helps to build the object detection classifier with high generalization potential and high detection accuracy.

Keywords:
Deep Convolution neural network (DCNN); Convolution neural network (CNN); Machine Vision; Defect detection; Fabric Defect Classification

Cite This Paper:
Meenakshi Garg, Gaurav Dhiman (2020). Deep Convolution Neural Network Approach for Defect Inspection of Textured Surfaces. Journal of the Institute of Electronics and Computer, 2, 28-38. https://doi.org/10.33969/JIEC.2020.21003.

References:

[1] Tiwari, V., & Sharma, G. (2015). Automatic fabric fault detection using morphological operations on bit plane. IJCSNS International Journal of Computer Science and Network Security, 5(10), 30-35.
[2] Ngan, H. Y., Pang, G. K., & Yung, N. H. (2011). Automated fabric defect detection—a review. Image and vision computing, 29(7), 442-458.
[3] Handbook, T. (2000). Hong Kong Productivity Council. The Hong Kong Cotton Spinners Association.
[4] Anh, N. T. H., & Giao, B. C. (2019, November). An Empirical Study on Fabric Defect Classification Using Deep Network Models. In International Conference on Future Data and Security Engineering (pp. 739-746). Springer, Cham.
[5] Boukouvalas, C., Kittler, J., Marik, R., & Petrou, M. (1999). Color grading of randomly textured ceramic tiles using color histograms. IEEE Transactions on industrial electronics, 46(1), 219-226.
[6] Wiltschi, K., Pinz, A., & Lindeberg, T. (2000). An automatic assessment scheme for steel quality inspection. Machine Vision and Applications, 12(3), 113-128.
[7] Chan, C. H., & Pang, G. K. (2000). Fabric defect detection by Fourier analysis. IEEE transactions on Industry Applications, 36(5), 1267-1276.
[8] Han, Y., & Shi, P. (2007). An adaptive level-selecting wavelet transform for texture defect detection. Image and Vision Computing, 25(8), 1239-1248.
[9] Tsai, D. M., & Hsiao, B. (2001). Automatic surface inspection using wavelet reconstruction. Pattern Recognition, 34(6), 1285-1305.
[10] Yang, X., Pang, G., & Yung, N. (2005). Robust fabric defect detection and classification using multiple adaptive wavelets. IEE Proceedings-Vision, Image and Signal Processing, 152(6), 715-723.
[11] Zhi, Y. X., Pang, G. K., & Yung, N. H. C. (2001, May). Fabric defect detection using adaptive wavelet. In 2001 IEEE International Conference on Acoustics, Speech, and Signal Processing. Proceedings (Cat. No. 01CH37221) (Vol. 6, pp. 3697-3700). IEEE.
[12] Jing, J. F., Ma, H., & Zhang, H. H. (2019). Automatic fabric defect detection using a deep convolutional neural network. Coloration Technology, 135(3), 213-223.
[13] Park, J. K., Kwon, B. K., Park, J. H., & Kang, D. J. (2016). Machine learning-based imaging system for surface defect inspection. International Journal of Precision Engineering and Manufacturing-Green Technology, 3(3), 303-310.
[14]Fukushima, K., Miyake, S., & Ito, T. (1983). Neocognitron: A neural network model for a mechanism of visual pattern recognition. IEEE transactions on systems, man, and cybernetics, (5), 826-834.
[15] Le, Y., Bottou, L., Bengio, Y., & Haffner, P. (1998). " Gradient-Based Learning Applied to Document Recognition", Proceedings of the IEEE, vol. 86, no. 11, pp. 2278-2324.
[16] Hinton, G. E., Osindero, S., & Teh, Y. W. (2006). A fast learning algorithm for deep belief nets. Neural computation, 18(7), 1527-1554.
[17] Collobert, R. and Weston, J., "A Unified Architecture for Natural Language Processing: Deep Neural Networks with Multitask Learning," Proc. of the 25th ICML, Vol. 25, pp. 160-167, 2008.
[18] Hinton, G., Deng, L., Yu, D., Dahl, G., Mohamed, A. R., Jaitly, N., ... & Sainath, T. (2012). Deep neural networks for acoustic modeling in speech recognition. IEEE Signal processing magazine, 29.
[19] Sonka, M., Hlavac, V., & Boyle, R. (2014). Image processing, analysis, and machine vision. Cengage Learning.

Review article | Published: 18 December 2021

151

Deep Learning Inspired Object Consolidation Approaches Using LiDAR Data for Autonomous Driving: A Review

M. S. Mekala, Woongkyu Park, Gaurav Dhiman, Gautam Srivastava, Ju H. Park & Ho-Youl Jung

Archives of Computational Methods in Engineering
29, 2579–2599 (2022)

Abstract

Autonomous Driving Vehicle (ADV) services have become a prominent motif in intelligent vehicle technology by adapting deep learning features. Automated driverless services are a hercules task due to the dynamic driving environment and the performance is deliberately reliant on the quality of data fusion from sensors. Therefore, considering advanced 3D LiDAR sensors is essential to measure the surrounding with 360° coverage. However, accomplishing maximum autonomy is the main challenge because of debilitated and complex driving environmenst. Deep Learning (DL) based models potentially impact surrounding measures for object detection, classification, and tracking. This study describes the importance of DL-LiDAR strategies to formulate ADV research challenges followed by a comprehensive analysis of Semantic Segmentation, Data Fusion, Data Representation, Feature Extraction, Dynamic Object Detection, and Autonomous Driving-Multi-Objective Tracking mechanisms. Unlike existing review papers, we examine various deep learning influenced approaches and describe their precarious measurements. Also, we analyze the impact of

Hindawi

Wireless Communications and Mobile Computing

130

Special Issue

AI-Based Federated Learning for 6G Mobile Networks

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 5543720 | https://doi.org/10.1155/2021/5543720

Show citation

Multimedia Concepts on Object Detection and Recognition with F1 Car Simulation Using Convolutional Layers

Amutha Balakrishnan,[1] Kadiyala Ramana,[2] Gaurav Dhiman,[3] Gokul Ashok,[1] Vidhyacharan Bhaskar,[4] Ashutosh Sharma,[5] Gurjot Singh Gaba,[6] **Mehedi Masud**,[7] and Jehad F. Al-Amri[8]

Show more

Academic Editor: Dafeng Hong

Published: 09 Dec 2021

Abstract

This paper presents a framework for detecting objects in images based on global features and contours. The first step is a shape matching algorithm that uses the background subtraction process. Object detection is accomplished by an examination of the oversegmentation of the image, where the space of the potential boundary of the object is examined to identify boundaries that have a direct resemblance to the prototype of the object type to be detected. Our analysis method removes edges using bilinear interpolation and reestablishes color sensors as lines and retracts background lines from the previous frame. Object contours are generated with clustered lines. The objects detected will then be recognized using the extraction technique. Here, we analyze the color and shape characteristics with which each object is capable of managing occlusion and interference. As an extension of object detection and recognition, F1 car simulation is experimented with simulation using various layers, such as layer drops, convolutionary layers, and boundary elimination, avoiding obstacles in different pathways.

1. Introduction

Object detection is the primary functionality needed by most computer and robot vision systems. The new study in this field has advanced significantly in many respects. Computer vision technology has rapidly and efficiently developed. These results have been achieved with computer vision methods and with the development of new representations and models for computer vision issues. In machine vision, we have seen great progress. It includes the details of object detection science. To detect objects, the system tracks objects in a scene and organises them into categories. The purpose of an object detector is to detect objects regardless of size, location, position, view with respect to the camera, partial occlusion, and illumination conditions.

Object detection is the first task of many computer vision systems to learn more about the object. Once a face

Hindawi

Mobile Information Systems

149

Special Issue

Machine Learning, Deep Learning and Optimization Techniques for Heterogeneous Sensor Information Integration

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 4912486 | https://doi.org/10.1155/2021/4912486

Show citation

Computer Vision-Enabled Character Recognition of Hand Gestures for Patients with Hearing and Speaking Disability

Sapna Juneja,[1] Abhinav Juneja,[1] Gaurav Dhiman,[2] Shashank Jain,[3] Anu Dhankhar,[4] and **Sandeep Kautish**[5]

Show more

Academic Editor: Xingsi Xue

Published: 14 Dec 2021

Abstract

Hand gesture recognition is one of the most sought technologies in the field of machine learning and computer vision. There has been an unprecedented demand for applications through which one can detect the hand signs for deaf people and people who use sign language to communicate, thereby detecting hand signs and correspondingly predicting the next word or recommending the word that may be most appropriate, followed by producing the word that the deaf people and people who use sign language to communicate want to say. This article presents an approach to develop such a system by that we can determine the most appropriate character from the sign that is being shown by the user or the person to the system. To enable pattern recognition, various machine learning techniques have been explored and we have used the CNN networks as a reliable solution in our context. The creation of such a system involves several convolution layers through which features have been captured layer by layer. The gathered features from the image are further used for training the model. The trained model efficiently predicts the most appropriate character in response to the sign exposed to the model. Thereafter, the predicted character is used to predict further words from it according to the recommendation system used in this case. The proposed system attains a prediction accuracy of 91.07%.

1. Introduction

Machine learning [1] has changed the dimensions of technology and perceives the world. There is a multidimensional growth in the range of applications [2] that are being supported by machine learning. All the three formats of machine learning including supervised, unsupervised, and reinforcement learning have been finding their solicitations in newer ways, affecting human lives and giving an all-new shape to how modern-day businesses are carried out. Among the various application of machine learning, computer vision is one area that is attracting the research community to harness the potential of technological developments

Hindawi

Security and Communication Networks

148

Special Issue

Recent Advances in Securing Medical Data

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 1747077 | https://doi.org/10.1155/2021/1747077

Show citation

A Personalized Eccentric Cyber-Physical System Architecture for Smart Healthcare

Amutha Balakrishnan,[1] Ramana Kadiyala,[2] Gaurav Dhiman,[3] Gokul Ashok,[1] **Sandeep Kautish**,[4] Kusum Yadav,[5] and J. Maruthi Nagendra Prasad[6]

Show more

Academic Editor: Thippa Reddy G

Published: 17 Dec 2021

Abstract

The development and technological advancement of wireless sensor networks in different fields has been a revolution for mankind. To meet the high-end requirements, the support of the cloud that provides the resources for the application is very much essential. This paper presents an architecture called cloud sense to connect cyber and physical spaces for wireless body area networks with varying high-end workflow at different perspectives. The scalability issue in collecting patient data and processing the data is established using ganglia that is a scalable, distributed monitoring system to support high-performance computing in clusters for the set of input events such as electrocardiogram (ECG), blood pressure (BP), saturation of peripheral oxygen (SPO_2), temperature, and skin conductance of the kind of human body parameters. Various parameter metrics have been analyzed based on the equivalent creation of instances. The connectivity mechanism behind the proposed cyber-physical system is unique of its kind; it is exhibited through wireless Internet on a small scale of three remote locations; the system works well with specific network parameter metrics; and the results proved that availability and scalability issues were addressed with numerical analysis.

1. Introduction

A cyber-physical system (CPS) is required to interconnect the physical devices in the hospital for healthcare monitoring and to analyze the data stored in the cloud. Besides, an analytics platform through the internet of things (IoT) is the need of the hour for efficient healthcare delivery in the world. The proposed CPS will act as an interface between the physical and cyber worlds. The physical world comprises the body sensors and the electronic devices that can be connected together to form the physical space. Cyberspace consists of the data where it can be transferred to the doctors and the researchers to analyze and make decisions for further need. The CPS that is proposed using the smart health application was operational under the following categories: (1) patient-centric, (2) network-centric, (3) hardware-centric, and (4) data-centric. CPS will

Hindawi

Wireless Communications and Mobile Computing

147

Special Issue

Artificial Intelligence for Wireless Communications and Control Networks

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 8000869 | https://doi.org/10.1155/2021/8000869

Show citation

Denial-of-Service Attack Detection over IPv6 Network Based on KNN Algorithm

Yasser Alharbi,[1] Ali Alferaidi,[1] Kusum Yadav,[1] Gaurav Dhiman ,[2] and **Sandeep Kautish** [3]

Show more

Academic Editor: Junjuan Xia

Published: 24 Dec 2021

Abstract

With the rapid increase and complexity of IPv6 network traffic, the traditional intrusion detection system Snort detects DoS attacks based on specific rules, which reduces the detection performance of IDS. To solve the DoS intrusion detection problem in the IPv6 network environment, the lightweight KNN optimization algorithm in machine learning is adopted. First, the double dimensionality reduction of features is achieved through the information gain rate, and discrete features with more subfeatures are selected and aggregated to further dimensionality reduction and feature dimension of the actual operation. Secondly, the information gain rate is used as the weight to optimize the sample Euclidean distance measurement. Based on the proposed measure of the reverse distance influence, the classification decision algorithm of the KNN algorithm is optimized to make the detection technology better. The effect is further improved. The experimental results show that the traditional TAD-KNN algorithm based on average distance and the GR-KNN algorithm that only optimizes the distance definition, the GR-AD-KNN algorithm can not only improve the overall detection performance in the detection of IPv6 network traffic characteristics but also for small groups of samples. As a result, classification has better detection results.

1. Introduction

With the rapid development of computer networks, traditional IPv4 network addresses have gradually been exhausted. To alleviate this problem, the birth of NAT technology has delayed the exhaustion of IPv4 addresses but still has not fundamentally solved the problem of insufficient addresses. Next, the generation of the Internet network protocol IPv6 [1–3] has radically solved this problem, significantly increasing the number of IP addresses that can be allocated, providing many IP addresses for networks such as the Internet of Things, as shown in Figure 1.

Hindawi

Journal of Healthcare Engineering

146

Special Issue

Advanced Computational Intelligence Technology in Healthcare Management

View this Special Issue

Review Article | Open Access

Volume 2021 | Article ID 6712424 | https://doi.org/10.1155/2021/6712424

Show citation

A Perspective Roadmap for IoMT-Based Early Detection and Care of the Neural Disorder, Dementia

Sapna Juneja,[1] Gaurav Dhiman,[2] **Sandeep Kautish**,[3] Wattana Viriyasitavat,[4] and Kusum Yadav[5]

Show more

Academic Editor: Khairunnisa Hasikin

Published: 29 Nov 2021

Abstract

The Internet of Medical Things (IoMT) has emerged as one of the most important key applications of IoT. IoMT makes the diagnosis and care more convenient and reliable with proven results. The paper presents the technology, open issues, and challenges of IoMT-based systems. It explores the various types of sensors and smart equipment based on IoMT and used for diagnosis and patient care. A comprehensive survey of early detection and postdetection care of the neural disorder dementia is conducted. The paper also presents a postdiagnosis dementia care model named "Demencare." This model incorporates eight sensors capable of tracking the daily routine of dementia patient. The patients can be monitored locally by an edge computing device kept at their premises. The medical experts may also monitor the patients' status for any deviation from normal behavior. IoMT enables better postdiagnosis care for neural disorders, like dementia and Alzheimer's. The patient's behavior and vital parameters are always available despite the remote location of the patients. The data of the patients may be classified, and new insights may be obtained to tackle patients in a better manner.

1. Introduction

With the increasing probability of the life span of the human beings on the planet and with the rise in chronic diseases, the Healthcare Industry is continuously trying to provide the finest services to the patients. But in the current scenario, the demand of resources of hospitalization is higher compared with the available [illegible]. So, to deal with the current situation, Internet of Things (IOT) appears to be the most [illegible] solution to provide services to patients at remote locations [1, 2]. The primary [illegible] applying IOT in healthcare industry is to provide a [illegible] interface through which [illegible] [illegible] communicate with each other not only in a [illegible] but also when [illegible] locations at a reasonable cost, in a minimum time, and [illegible] any time [3]. To [illegible] [illegible] and doctors are able to diagnose, monitor, [illegible]

IQAC Govt. Bikram College of Commerce, Patiala, Punjab

Criterion Incharge

Co-ordinator NAAC Govt. Bikram College of Commerce, Patiala

Principal Govt. Bikram College of Commerce, Patiala

Hindawi

Mathematical Problems in Engineering

145

Special Issue

Modelling and Design Optimization of Complex Engineering Systems considering Mixed Uncertainties

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 2423750 | https://doi.org/10.1155/2021/2423750

Show citation

Requirements for the Optimal Design for the Metasystematic Sustainability of Digital Double-Form Systems

Gaurav Dhiman [1], Gaganpreet Kaur [2], Mohd Anul Haq [3], and **Mohammad Shabaz** [2,4]

Show more

Academic Editor: Debiao Meng

Published: 30 Nov 2021

Abstract

The United Nations defined tenable progress as a development that responds to the demands of the current without adjusting the capacity of further generations to fulfil their own requirements; this is a fundamental idea in this article. This study recognizes three aspects, financial, social, and environmental sustainability, although its emphasis is on the latter. An electronic copy is sometimes characterized a physical thing, a real counterpart, and the data, which indicates the presence of a connector and block for effective and efficient data transmission. This article offers a systematic literature review on the sustainability of designed technology-based systems. This article also introduces the major requirements which can be helpful in designing optimal design for sustainability of a digital double-form system. Many articles on DT have also been chosen since they referenced the studied SLRs and were deemed to be significant for the objectives of this study. Selected and analysed for papers revealed so many flaws and challenges: the boons of are not clear; DTs throughout the result the wheel of life of the DTs is not adequately surveyed; DTs can contribute to cost reduction or to support decision-making is unclear; Internet practice should be improved and better integrated Moreover, it has not been feasible from our study to locate a publication which solely discusses DTs in relation with situational sustainability.

1. Introducing the Report

An electronic copy (DT) is frequently characterized as an electronic, real body with a physical counterpart and data links including connectors and blocks, which make efficient and efficient transmission of the data possible. It is an electronic representation of a [illegible] system and despite the various explanations of DT, an [illegible], and [illegible] pioneers of this idea are Grieves and Vickers of NASA and presented on product cycle management and recognised. They mention features such as [illegible] practical output, (ii) an online representation, and (iii) bidirectional data interfaces between practical and real representation. Output design, modelling, simulation, and optimisation of assets are the primary objectives of DT development [2, 3].

(144)

Home / Journals / CMC / Vol.70, No.3, 2022 / 10.32604/cmc.2022.021072

Table of Content

Open Access ARTICLE

MLA: A New Mutated Leader Algorithm for Solving Optimization Problems

Fatemeh Ahmadi Zeidabadi[1], Sajjad Amiri Doumari[1], Mohammad Dehghani[2], Zeinab Montazeri[3], Pavel Trojovský[4,*], Gaurav Dhiman[5]

1 Department of Mathematics and Computer Sciences, Sirjan University of Technology, Sirjan, Iran
2 Graduate of Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, Iran
3 Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, Iran
4 Department of Mathematics, Faculty of Science, University of Hradec Králové, 500 03, Hradec Králové, Czech Republic
5 Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab, India
* Corresponding Author: Pavel Trojovský. Email: pavel.trojovsky@uhk.cz

(This article belongs to this Special Issue: Recent Advances in Metaheuristic Techniques and Their Real-World Applications)

Hindawi
Journal of Sensors
Volume 2021, Article ID 7548329, 12 pages
https://doi.org/10.1155/2021/7548329

143

Hindawi

Research Article

The Identification Nanoparticle Sensor Using Back Propagation Neural Network Optimized by Genetic Algorithm

Yiwen Hu,[1] **Ashutosh Sharma**,[2] **Gaurav Dhiman**,[3] **and Mohammad Shabaz**[4]

[1]*Testing Center of Aviation Theory, Civil Aviation Flight University of China Guanghan, Sichuan 618307, China*
[2]*Institute of Computer Technology and Information Security, Southern Federal University, Russia*
[3]*Government Bikram College of Commerce, Punjab, India*
[4]*Arba Minch University, Ethiopia*

Correspondence should be addressed to Yiwen Hu; yiwenhu21@outlook.com
and Mohammad Shabaz; mohammad.shabaz@amu.edu.et

Received 9 June 2021; Revised 6 October 2021; Accepted 1 November 2021; Published 18 November 2021

Academic Editor: Alfian Abdul Halin

This study draws attention towards the application of identification nanoparticle (NPs) sensor based on back propagation (BP) neural network optimized by genetic algorithm (GA) in the early diagnosis of cancer cells. In this study, the traditional and optimized BP neural networks are compared in terms of error between the actual value and the predictive value, and they are further applied to the NP sensor for early diagnosis of cancer cells. The results show that the root mean square (RMS) and mean absolute error (MAE) of the optimized BP neural network are comparatively much smaller than the traditional ones. The particle size of silicon-coated fluorescent NPs is about 105 nm, and the relative fluorescence intensity of silicon-coated fluorescent NPs decreases slightly, maintaining the accuracy value above 80%. In the fluorescence imaging, it is found that there is obvious green fluorescence on the surface of the cancer cells, and the cancer cells still emit bright green fluorescence under the dark-field conditions. In this study, a phenolic resin polymer CMK-2 with a large surface area is successfully combined with Au. NPs with good dielectric property and bioaffinity are selectively bonded to the modified electrode through a sulfur-gold bond to prepare NP sensor. The sensor shows good stability, selectivity, and anti-interference property, providing a new method for the detection of early cancer cells.

1. Introduction

In the past few years, people's increasingly high requirements for microscopic detection technology have led to an evolution, in the applications of various nanomaterials in the biological field. NPs refer to particles with a particle size between 1 and100 nm, and it is a new material for research at the molecular level, cellular level, and subcellular level [1]. The NP-based nanotechnology can be applied to the diagnosis and treatment of tumors [2].

Fluorophores can be added to NPs by covalent bonding or embedding to form fluorescent NPs [3], which are used as fluorescent dyes for detection or labeling. Compared with ordinary fluorescent dyes, fluorescent NPs have high brightness, good stability, strong water solubility, and good biocompatibility [4]. Cancer cell imaging is of great significance in the diagnosis of tumors. As a carrier material, fluorescent NPs can enhance biological signals to facilitate detection [5]. Hyaluronic acid (HA) has a good application prospect in the diagnosis and treatment of tumor diseases [6]. A nanodrug-carrying system prepared by combining NPs and HA can specifically bind to receptor proteins on the cell surface to detect cancer cells. Shen et al. [7] prepared diamine-hyaluronic acid-iron-modified rhodamine fluorescent NPs for cancer imaging detection. The results proved that fluorescent NPs had high sensitivity and stability.

Sensors play an important role in various fields, and chemical sensors are generally used to detect chemical substances. Electrochemical biosensors use active substances in organisms as sensitive elements. It converts them into electrochemical signals to output characteristic signals such as potential, current, and capacitance [8]. The principle of

Table of Content

Open Access ARTICLE

AMBO: All Members-Based Optimizer for Solving Optimization Problems

Fatemeh Ahmadi Zeidabadi[1], Sajjad Amiri Doumari[1], Mohammad Dehghani[2], Zeinab Montazeri[2], Pavel Trojovský[3,*], Gaurav Dhiman[4]

1 Department of Mathematics and Computer Sciences, Sirjan University of Technology, Sirjan, Iran

2 Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, Iran

3 Department of Mathematics, Faculty of Science, University of Hradec Králové, Hradec Králové, 50003, Czech Republic

4 Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab, India

* Corresponding Author: Pavel Trojovský. Email: pavel.trojovsky@uhk.cz

(This article belongs to this Special Issue: Integrity and Multimedia Data Management in Healthcare Applications using IoT)

Computers, Materials & Continua **2022**, *70*(2), 2905-2921.

https://doi.org/10.32604/cmc.2022.019867

141

Predicting the Death Rate Around the World Due to COVID-19 Using Regression Analysis

Rajit Nair (Jagran Lackecity University, India), Mueksh Soni (Jagran Lakecity University, India), Bhavna Bajpai (Dr. C. V. Raman University, Khandwa, India), Gaurav Dhiman (/affiliate/gaurav-dhiman/387517/) (Government Bikram College of Commerce, India & Lebanese American University, Lebanon), and K. Martin Sagayam (Karunya Institute of Technology and Sciences, India)

Source Title: International Journal of Swarm Intelligence Research (IJSIR) (/journal/international-journal-swarm-intelligence-research/1149) 13(2)

Pages: 13

DOI: 10.4018/IJSIR.287545

Abstract

Nowadays, COVID-19 is considered to be the biggest disaster that the world is facing. It has created a lot of destruction in the whole world. Due to this COVID-19, analysis has been done to predict the death rate and infected rate from the total population. To perform the analysis on COVID-19, regression analysis has been implemented by applying the differential equation and ordinary differential equation (ODE) on the parameters. The parameters taken for analysis are the number of susceptible individuals, the number of Infected Individuals, and the number of Recovered Individuals. This work will predict the total cases, death cases, and infected cases in the near future based on different reproductive rate values. This work has shown the comparison based on 4 different productive rates i.e. 2.45, 2.55, 2.65, and 2.75. The analysis is done on two different datasets; the first dataset is related to China, and the second dataset is associated with the world's data. The work has predicted that by 2020-08-12: 59,450,123 new cases and 432,499,003 total cases and 10,928,383 deaths.

Article Preview

Top

History Of Virus

Coronavirus belongs to the Orthocoronavirinae subfamily of the Coronaviridae family in the class Nidovirales, which primarily caused respiratory and gastrointestinal tract infections (Nidovirales, 2012). The 2019-nCoV is a novel beta-coronavirus enveloped with a single-stranded positive-sense RNA genome (Choi et al., 2020). As for the virus sources, some phylogenetic analyzes indicated that the bat is the most likely source of species. Based on genome sequencing, 2019-nCoV is approximately 89% identical to bat SARS-like-CoVZXC21, 82% similar to human SARS-CoV, and about 50% equal to MERS-CoV (Ramanathan, 2020).

Because both SARS-CoV and MERS-CoV have been transmitted from bats to palm civets or dromedical camels, and finally to humans, some more species can also be considered as an intermediate host between bat and human. Pangolins were proposed as possible intermediate hosts because their genome was approximately 85.5 percent -92.4 percent identical to 2019-nCoV, reflecting two phylogenetic tree sub-lineages of 2019-nCoV, each of which (GD / P1L and GX / 2S) was closely related to 2019-nCoV (Ng et al., 2020). Other work indicated 2019-nCoV was the recombinant virus of bat coronavirus and snake coronavirus, compared with the apparent synonymous bias in the use of codon between separate animal species (Ji et al., 2020). We have yet to discover the facts.

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

Principal

Hindawi

Wireless Communications and Mobile Computing

140

Special Issue

Developments in Mobile Multimedia Technologies

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 5835806 | https://doi.org/10.1155/2021/5835806

Show citation

Performance Analysis of WOFDM-WiMAX Integrating Diverse Wavelets for 5G Applications

Lavish Kansal [1], Gurjot Singh Gaba [2], Ashutosh Sharma [3], Gaurav Dhiman [4], Mohammed Baz [5] and **Mehedi Masud** [6]

Show more

Academic Editor: Yuanlong Cao

Published: 01 Nov 2021

Abstract

In the 5th generation (5G) and 6th generation (6G) of wireless mobile telecommunication networks, the requests for an elevated data rate with access to stationary as well as portable customers are going to be overwhelming. Mobile worldwide interoperability for microwave access (WiMAX) comes out as a favourable alternative that is intelligibly developed and more matured than wireless fidelity (Wi-Fi). Mobile WiMAX makes use of the orthogonal frequency division multiple access (OFDMA) technology for its two-way communication to enhance the system performance in fading environments making it more suitable for 5G applications. The diverse OFDM forms deliberated here are the fast Fourier transform- (FFT-) based WiMAX and discrete wavelet transform- (DWT-) based WiMAX. The suggested study exhibits the bit error rate (BER) and peak to average power ratio (PAPR) reduction by integrating different wavelet families, i.e., Haar, symlet, coiflet, and reverse biorthogonal over Rayleigh fading channel. The simulation results obtained by MATLAB depicts an improvement in PAPR reduction, and signal to noise ratio (SNR) requirement is also reduced by 6-12 dB by using DWT-incorporated WiMAX at a BER of 10^{-4}.

1. Introduction

WiMAX organizations specifically designed WiMAX system to have unanimity and consistency of the IEEE 802.16 guidelines, as of now called a wireless metropolitan area network (MAN). IEEE 802.16c operating in the 10-66 GHz frequency range for the line of sight (LOS) propagation was introduced by IEEE in 2002. The IEEE 802.16c includes the specifications for connectivity between remote areas and data distribution over a wide area network for both point to point (PPP) and point to multipoint (PMP) communication over microwave frequencies. Further, IEEE introduced a new version, i.e., IEEE 802.16a operating over the frequency range of 2-11 GHz and suitable for nonline of sight (NLOS) signal propagation. IEEE 802.16d, an improved form of IEEE 802.16, was proposed in 2004 for providing wideband connectivity to indoor clients. The IEEE affirmed the 802.16 benchmarks in June 2004, and three working groups were framed to access

139

Special Issue

Machine Learning and Blockchain Technology for Smart Healthcare and Human Health

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 5912051 | https://doi.org/10.1155/2021/5912051

Show citation

Adaptive Diagnosis of Lung Cancer by Deep Learning Classification Using Wilcoxon Gain and Generator

O. Obulesu [1], Suresh Kallam [2], Gaurav Dhiman [3], Rizwan Patan [4], Ramana Kadiyala [5], Yaswanth Raparthi [6] and **Sandeep Kautish** [7]

Show more

Academic Editor: Yang Gao

Published: 13 Oct 2021

Abstract

Cancer is a complicated worldwide health issue with an increasing death rate in recent years. With the swift blooming of the high throughput technology and several machine learning methods that have unfolded in recent years, progress in cancer disease diagnosis has been made based on subset features, providing awareness of the efficient and precise disease diagnosis. Hence, progressive machine learning techniques that can, fortunately, differentiate lung cancer patients from healthy persons are of great concern. This paper proposes a novel Wilcoxon Signed-Rank Gain Preprocessing combined with Generative Deep Learning called Wilcoxon Signed Generative Deep Learning (WS-GDL) method for lung cancer disease diagnosis. Firstly, test significance analysis and information gain eliminate redundant and irrelevant attributes and extract many informative and significant attributes. Then, using a generator function, the Generative Deep Learning method is used to learn the deep features. Finally, a minimax game (i.e., minimizing error with maximum accuracy) is proposed to diagnose the disease. Numerical experiments on the Thoracic Surgery Data Set are used to test the WS-GDL method's disease diagnosis performance. The WS-GDL approach may create relevant and significant attributes and adaptively diagnose the disease by selecting optimal learning model parameters. Quantitative experimental results show that the WS-GDL method achieves better diagnosis performance and higher computing efficiency in computational time, computational complexity, and false-positive rate compared to state-of-the-art approaches.

1. Introduction

Over the last few years, a sustained advancement connected to cancer research has been implemented. Researchers applied several mechanisms, like early-stage screening, to identify the cancer types before they

138

Original Article | Open Access |
Published: 11 November 2021

SHANN: an IoT and machine-learning-assisted edge cross-layered routing protocol using spotted hyena optimizer

Gaurav Dhiman & Rohit Sharma

Complex & Intelligent Systems **8**, 3779–3787 (2022)

Abstract

In the case of new technology application, the cognitive radio network (CRN) addresses the bandwidth shortfall and the fixed spectrum problem. The method for CRN routing, however, often encounters issues with regard to road discovery, diversity of resources and mobility. In this paper, we present a reconfigurable CRN-based cross-layer routing protocol with the purpose of increasing routing performance and optimizing data transfer in reconfigurable networks. Recently developed spotted hyena optimizer (SHO) is used for tuning the hyperparameters of machine-learning models. The system produces a distributor built with a number of tasks, such as load balance, quarter sensing and the development path of machine learning. The proposed technique is sensitive to traffic and charges, as well as a series of other network metrics and interference (2bps/Hz/W average). The tests are performed with classic models that demonstrate the residual energy and strength of the resistant scalability and resource

Service Workflow: State-of-the-Art and Future Trends

Publisher: IEEE

Wattana Viriyasitavat ; Li Da Xu ; Gaurav Dhiman ; Assadaporn Sapsomboon ; ... All Authors

Abstract: Workflow is used to support and connect business processes (BP) in organizations. Historically, it is used to define the control of how tasks are coordinated and executed... **View more**

▸ **Metadata**

Abstract:

Workflow is used to support and connect business processes (BP) in organizations. Historically, it is used to define the control of how tasks are coordinated and executed. Its importance has been continuously increasing with the incorporation of rapidly developed Service-oriented Architecture (SoA), Blockchain, and Internet-of-Thing (IoT); new information technologies have expanded the coverage of workflow across various applications. Workflows often interact with services, where SoA is a key driver to smoot service discovery and provide standards for interoperation. In decentralized collaborative environments, a workflow often deals with disparate services dynamically and interacts with services on demand. This not only unlocks the potentials of workflow applications in business process managements (BPM), but also precipitates significant challenges and has brought considerable attentions to the research community. This paper investigates the state-of-the-art of service workflow modelling and enabling technologies. It begins with the identification and examination of workflow and IoT characteristics; it proposes a workflow architecture to classify existing works on service workflows, and it summarizes the methods for workflow modeling, service interoperation to identify the limitations of existing works and clarify future research directions in using service workflows.

Published in: IEEE Transactions on Services Computing (Volume: 16 , Issue: 1, 01 Jan.-Feb. 2023)

Page(s): 757 - 772 **DOI:** 10.1109/TSC.2021.3121394

Date of Publication: 20 October 2021 **Publisher:** IEEE

▸ **ISSN Information:**

Wattana Viriyasitavat

Thailand

(136)

A Novel Blockchain and Bi-Linear Polynomial-Based QCP-ABE Framework for Privacy and Security over the Complex Cloud Data

by Kranthi Kumar Singamaneni [1], Kadiyala Ramana [2], Gaurav Dhiman [3], Saurabh Singh [4,*] and Byungun Yoon [4]

[1] Department of Computer Science and Engineering, GITAM Institute of Technology, GITAM Deemed to be University, Visakhapatnam 530045, India
[2] Department of Artificial Intelligence & Data Science, Annamacharya Institute of Technology and Sciences, Rajampet 516115, India
[3] Department of Computer Science, Government Bikram College of Commerce, Patiala 147001, India
[4] Department of Industrial and System Engineering, Dongguk University, Seoul 04620, Korea
* Author to whom correspondence should be addressed.

Govt. Bikram College of Commerce, Patiala-147001 * Punjab * IQAC

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala

Connection Science ›
Volume 34, 2022 - Issue 1

Open access

1,459 Views | 6 CrossRef citations to date | 1 Altmetric

135

A novel cluster head selection using Hybrid Artificial Bee Colony and Firefly Algorithm for network lifetime and stability in WSNs

J. Sengathir, A. Rajesh, **Gaurav Dhiman**, S. Vimal, C.A. Yogaraja & Wattana Viriyasitavat

Pages 387-408 | Received 04 Jan 2021, Accepted 29 Oct 2021, Published online: 24 Nov 2021

Download citation https://doi.org/10.1080/09540091.2021.2004997 Check for updates

Abstract

Wireless Sensor Networks (WSNs) are capable of achieving data dissemination between them such that exploration of their potential could be performed based on their frequency range. It is considered to be highly difficult for recharging sensor devices under adverse situations. The main drawbacks of WSNs concern to the issue of network lifetime, coverage area, scheduling and data aggregation. In particular, prolonging network lifetime confirms the success together with the energy conservation of sensor nodes, data transmission reliability and scalability of their operation in data aggregation. Clustering schemes are considered to be highly suitable for effectively utilising the resources with lower overhead, such that energy consumption is enhanced for upgrading the network lifespan. In this paper, a Hybrid Modified Artificial Bee Colony and Firefly Algorithm (HMABCFA) -Based Cluster Head Selection is proposed for ensuring energy stabilization, delay minimisation and inter-node distance reduction for improving the network lifetime. This proposed HMABCFA

134

Sustainable Computing: Informatics and Systems
Volume 33, January 2022, 100622

Internet of Things for sustaining a smart and secure healthcare system

Prabh Deep Singh [a], Gaurav Dhiman [b], Rohit Sharma [c]

Show more

https://doi.org/10.1016/j.suscom.2021.100622
Get rights and content

Highlights

- Offers a IoT platform to track the infected cases.
- Enhance the consistency, performance, effectiveness etc of the health care services.
- Establish security for the healthcare system.
- Provides a more significant latency result, energy consumption, and a higher QoS.

Abstract

The thyroid is a key endocrine gland in the human body that regulates several bodily processes, including protein synthesis, energy consumption, and the body's reaction to other hormones. Segmentation and volume regeneration of the thyroid is particularly important for identifying thyroid-related diseases since the majority of these problems result in a change in the thyroid's shape and scale over time. There is an urgent need for research on the disease's origins and spread. The Internet of Things, cloud computing, and artificial intelligence all provide real-time processing for a variety of applications in the healthcare sector. In healthcare and biomedicine applications, machine learning algorithms are increasingly being utilized to make critical choices. Thyroid patients urgently need a robust and latency-sensitive Quality of Service framework. This paper aims to integrate fog computing and artificial intelligence with smart health to provide a dependable platform for thyroid infection early detection. To identify thyroid patients, a novel ensemble-based classifier is proposed. The thyroid dataset is obtained from the UCI library and the simulation is carried out utilizing Python programming. To increase the framework's security, encryption and decryption methods are suggested. The suggested framework's performance is assessed in terms of latency, network use, RAM utilization, and energy consumption. On the other side, the suggested classifier's accuracy, precision, specificity, sensitivity and F1 score are all assessed. The result demonstrates that the suggested framework and classifier perform consistently better than conventional frameworks and classifiers.

133

Soft Computing - A Fusion of Foundations, Methodologies and Applications

Identification of apple diseases in digital images by using the Gaining-sharing knowledge-based algorithm for multilevel thresholding

Authors: Noé Ortega-Sánchez, Erick Rodríguez-Esparza, Diego Oliva, Marco Pérez-Cisneros, Ali Wagdy Mohamed, Gaurav Dhiman, + 1 Authors Info & Claims

Soft Computing - A Fusion of Foundations, Methodologies and Applications, Volume 26, Issue 5 • Mar 2022 • pp 2587–2623 • https://doi.org/10.1007/s00500-021-06418-5

Published: 01 March 2022 Publication History

Abstract

ABSTRACT

Identifying the defects in apples is commonly done with visual examination techniques. However, it is a slow and laborious process. Image processing techniques have begun to be used to help and make the diagnosis of fruit diseases more efficient. In image processing systems, the segmentation of regions in the scenes is a crucial step. Specifically for images from apples, disease segmentation is a complicated task due to the different elements that affect the acquisition of the images. In addition, apple diseases also have features that need to be segmented. In this work, an efficient approach that uses the Gaining-sharing Knowledge-based (GSK) algorithm is proposed to optimize the minimum cross-entropy thresholding (MCET) for the segmentation of apple images highlighting the diseases defects. The proposed MCET-GSK has been tested for experimental purposes over different images and compared with various metaheuristics. The experiments were conducted to provide evidence of the GSK's optimization capabilities by performing the Wilcoxon test and applying a set of metrics to verify the quality of the segmented images. The experimental results validate the performance of the MCET-GSK in the segmentation of apple images by adequately separating the regions with damage produced by a disease. The quality of the segmentation is superior compared with other similar approaches.

Expert Systems / Early View / e12892

ORIGINAL ARTICLE

132

An IoT and Blockchain-based approach for the smart water management system in agriculture

Hui Zeng, Gaurav Dhiman ✉, Ashutosh Sharma, Amit Sharma, Alexey Tselykh

First published: 24 November 2021
https://doi.org/10.1111/exsy.12892
Citations: 5

Abstract

Agriculture in rural areas facing critical issues such as irrigation with the increase in water crises followed by some other issues line seed quality, poor fertilizers and many others. The recent advances suggest that IoT and Blockchain Technology along with artificial intelligence will be most dominant technologies in near future. In this article, the integration of Internet of Things (IoT) with Blockchain technology is implemented for monitoring agricultural fields efficiently. An efficient seed quality monitoring and smart water management system is design using IoT and Blockchain Technology for managing and coordinating the use of good quality seeds and water resources among communities. The Blockchain network is implemented for securing the information and supporting trust among the members of community. The Blockchain network is also implemented for sporting trust among commercial resource constrained systems, which are communicating with the Blockchain network consisting of a hardware platform. The design of a prototype and its performance evaluation based on implementation is also presented.

Open Research

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Citing Literature

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

Citation Statements beta

Supporting	Mentioning	Contrasting
ⓘ 0	ⓘ 11	ⓘ 0

Explore this article's citation statements on scite.ai

131

Expert Systems / Early View / e12896

ORIGINAL ARTICLE

An improved exponential metric space approach for C-mean clustering analysing

Rakesh Kumar, Varun Joshi, Gaurav Dhiman ✉, Wattana Viriyasitavat

First published: 29 November 2021
https://doi.org/10.1111/exsy.12896
Citations: 3

Abstract

In this article, we present two resilient algorithms, the improved alternative hard c-means (IAHCM) and the improved alternative fuzzy c-means (IAFCM). We implement the Gaussian distance-dependent function proposed by Zhang and Chen (D.-Q. Zhang and Chen, 2004). In some cases, Zhang and Chen's metric distance does not account for the clustering centroid effect predicted by the large value. R* is employed in IAHCM and IAFCM to discover robust results while minimizing its sensitivity. Experiments are conducted using two-and three-dimensional data, including Diamond and Iris real-world data. The results are based on demonstrating the robust simplicity and applicability of the offered algorithms. Similarly, computational complexity is assessed.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

Open Research

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

Citing Literature

Hindawi

Security and Communication Networks

130

Special Issue

Security, Privacy and Reliability in Cloud-based Internet of Things

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 7185827 | https://doi.org/10.1155/2021/7185827

Show citation

PoC Design: A Methodology for Proof-of-Concept (PoC) Development on Internet of Things Connected Dynamic Environments

K. Prasanna [1], Kadiyala Ramana [1], Gaurav Dhiman [2], **Sandeep Kautish** [3] and V. Deeban Chakravarthy [4]

Show more

Academic Editor: Chien Ming Chen

Published: 06 Oct 2021

Abstract

Internet of Things (IoT) is a phenomenon involving connecting things or objects with sensors. The IoT market is growing rapidly, and there are strong incentives for companies to follow the trend of IoT growth and development. However, the percentage of IoT measures that are considered successful seems low. The complexity of carrying out an IoT project lies in the need to adjust all the pieces of the puzzle: assets, sensors, communications, technology, coverage, and geographical locations with precision of the measures and regulations. All these requirements determine the economic viability of the business and its benefit. This study, therefore, examines how the project methodology can support the development of the concept and ensure the business value of IoT initiatives. The project methodology developed in this study is called PoC Design. A case study was evaluated, in which defects in street lighting were investigated and carried out. The evaluation of the methodology highlighted the importance of defining problems and solutions based on business value, calculating the potential of an IoT initiative, determining the continuation of the project, involving stakeholders at an early stage, and creating a PoC to validate the concept with stakeholders.

1. Introduction

In software development, the term "proof of concept" (PoC) can be an essential tool to demonstrate the capabilities and suitability of the software for the requirements and to show that the concept is feasible and meets the needs of customers. While some applications are proof of concept in various fields, from marketing to medicine; in terms of software development, we are talking about a specific process that may take the development of hardware, websites, or other software to implement a concept. This process is designed to determine whether a software concept can be created in the real world, what technology to use for development, and whether the intended users are likely to use the software.

ScienceDirect

Applied Soft Computing
Volume 113, Part B, December 2021, 107981

129

A soft computing based multi-objective optimization approach for automatic prediction of software cost models

Shailendra Pratap Singh [a], Gaurav Dhiman [b], Prayag Tiwari [c], Rutvij H. Jhaveri [d]

Show more

https://doi.org/10.1016/j.asoc.2021.107981
Get rights and content

Abstract

This paper tries to extend the idea of single-objective differential evolution (DE) algorithm to a multi-objective algorithm. Most of the existing algorithms face the problem of diversity loss and convergence rate. In this paper, we propose a novel multi-objective DE algorithm to deal with this problem. In the validation process, the proposed method is validated in two steps. Firstly, the new homeostasis factor-based mutation operator incorporates multi-objective differential evolution algorithms (MODE). In this method, we use the Pareto optimality principle. We incorporate a new adaptive-based mutation operator (MODE) to create more diversity and enhance convergence rate among candidate solutions which provide better solutions to help the evolution. The effectiveness of the proposed method is evaluated on eight benchmarks of bi-objective and tri-objective test functions. Our proposed method performed well compared to the latest variants of multi-objective evolutionary algorithms (MOEAs). Secondly, the proposed method is used for an application-based test by applying it for software cost estimation. This method also incorporates multi-objective parameters, i.e., two objectives-based software cost estimation and three objectives-based software cost estimation. The proposed approach achieves better results in most software projects in terms of reducing effort and minimum error.

Introduction

DE is a stochastic population-based optimization algorithm developed by Storn and Price[1]. It is considered to be the most promising algorithm to solve optimization problems in the real world[2], [3]. However, the current DE is mainly focused on getting one optimum solution for the problem, and the concept of the Pareto front was completely ignored by the researchers[1]. In the Pareto approach, the author addresses the numerous objectives rather than single-objective optimization. In addition, the objective function is a vector rather than a scalar value. From the literature, it has been confirmed that Pareto-

Hindawi

Scientific Programming

127

Special Issue

Scientific Programming Towards a Smart World 2021

View this Special Issue

Review Article | Open Access

Volume 2021 | Article ID 9101782 | https://doi.org/10.1155/2021/9101782

Show citation

Futuristic Cyber-Twin Architecture for 6G Technology to Support Internet of Everything

Sapna Juneja [1], Mamta Gahlan [2], Gaurav Dhiman [3] and **Sandeep Kautish** [4]

Show more

Academic Editor: Yi-Zhang Jiang

Published: 06 Oct 2021

Abstract

With the rapid growth of Internet of Everything, there is a huge rise in the transportable Internet traffic due to which its associated resources have exceptional obstacles which include reliability, security, expandability, security, and portability which the current available network architectures are unable to deal with. In this paper, an IoT centric cyber-physical twin architecture has been proposed for 6G Technology. The cyber-twin technology helps out in serving stronger communication and also contains several features that help out in assisting communication like maintaining a log record of network data and managing all digital assets like images, audio, video, and so forth. These features of the cyber-twin technology enable the proposed network to deal with those exceptional obstacles and make the system more reliable, safe, workable, and adaptable.

1. Introduction

The population of the world is growing like a bomb and the people are now connected with each other with the help of millions of devices. The available networks will be insufficient to accomplish the rising demand of billions of devices thereafter. Thus, the presumed future network should be able to gratify the intense network traffic and its associated services. In the current times, Internet of Everything seems to be a future network system that can attain rational connections between humans and devices with the help of various technologies like Machine Learning and 5G. An Internet of Everything enabled network architecture to reinforce the complex features of data like collecting the data, data clustering, refining, and lastly allocating it for utilization.

2. Literature Review

The current network architecture suffers from the scalability problem, that is, not being able to fulfill the tremendously increasing demand of Internet services and devices. Further, in order to secure the network, all

Hindawi

Computational Intelligence and Neuroscience

126

Special Issue

Swarm Intelligence and Neural Network Schemes for Biomedical Data Evaluation

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 2214971 | https://doi.org/10.1155/2021/2214971

Show citation

Evaluation of Ergonomics-Related Disorders in Online Education Using Fuzzy AHP

Hemant Upadhyay [1], **Sapna Juneja** [2], Abhinav Juneja [3], Gaurav Dhiman [4] and **Sandeep Kautish** [5]

Show more

Academic Editor: Navid Razmjooy

Published: 27 Sept 2021

Abstract

The aim of the presented work is to analyze the ergonomics-related disorders in online education using the fuzzy AHP approach. A group dialogue with online education academicians, online education students, biotechnologists, and sedentary computer users has been performed to spot ergonomics-related disorders in online education. Totally eight ergonomics-related disorders in online education have been identified, and the weight of each disorder has been computed with triangle-shaped fuzzy numbers in pairwise comparison. Furthermore, the ergonomics-related disorders in online education are kept in four major categories such as afflictive disorders, specific disorders, psychosocial disorders, and chronic disorders. These four categories of ergonomics-related disorders in online education are evaluated and compared using fuzzy analytical hierarchical process methodology to get ranked in terms of priorities. The results may be instrumental for taking appropriate corrective actions to prevent ergonomics-related disorders.

1. Introduction

The international associations have termed ergonomics to be "the design of work, in such a manner that human competencies can be utilized in the best possible manner without overcoming human constraints" [1]. Ergonomics is the scientific know-how of the man at work, with the numerous psychosocial and medical characteristics of human work. The practical objective of ergonomics is the conditioning and justification of the adaptation of work to man [2]. The ergonomic literature such as that of Hünting et al. [3], Sauter et al. [4], and Berqvist et al. [5] have been mostly on the basis of desktop computers.

Several documents of reputed research and academic institutions [6] indicate common ergonomics-based documentation. These days, a large number of studies on computer-human interfaces have introduced newer ergonomics criteria and recommendations [2]. It has been observed that if essential precautions were not considered for inappropriate and very frequent computer utilization in our day-to-day lives, a considerable

125

Article

Study on Automatic Tracking Method of Marking Points in Sports Image Sequence

November 2021 · Recent Advances in Electrical & Electronic Engineering (Formerly Recent Patents on Electrical & Electronic Engineering) 14(7):708-717
DOI:10.2174/2352096514666210719125126

Authors:

Cong Hua Pan

Gaurav Dhiman
Government Bikram College of Commerce Patiala

Abstract

Background The effect of teaching and training in physical sports is improved by the sports demonstration system. The two-dimensional sports demonstration system is widely applied for the training of athletes. In accurate motion positioning, there exists a certain visual deficiency and the two-dimensional sports demonstration system is analyzed by kinematics. Methodology Aiming at the problems in the real-time tracking of fast-moving targets in sports images, an automatic tracking method of sports images based on the registration of landmark points of the passive optical motion capture system is proposed. Moreover, it aims to build a human model and divide the human model into several limb segments; find the corresponding relationship between the first frame of motion data and template data to complete the first frame of motion data registration; based on the smallest non-rigid deformation and point set matching error, find the corresponding relationship between the current frame of motion data and the previous frame of registered motion data; through the mark points, follow up to complete the registration process of the marker. Results Experiments show that the average processing accuracy of this algorithm can reach over 85% and the processing time of a single frame of motion data is t<1/60s, which can meet real-time requirements. Conclusion The multi-point set least-squares matching algorithm is used to rigidly correct the registered landmark data. No manual intervention is required for the entire mark registration process.

Govt. Bikram College of Commerce, Patiala (PUNJAB) IQAC Punjab

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala

124

IETE Journal of Research ›
Latest Articles

65 Views | 15 CrossRef citations to date | 0 Altmetric

Research Article

Gender and Age Classification Enabled Blockschain Security Mechanism for Assisting Mobile Application

Sapna Juneja, Sourav Jain, Aparna Suneja, Gurminder Kaur, Yasser Alharbi, Ali Alferaidi, Abdullah Alharbi, Wattana Viriyasitavat & Gaurav Dhiman ...show less

Published online: 19 Oct 2021

Download citation https://doi.org/10.1080/03772063.2021.1982418 Check for updates

Abstract

This research paper focus on a Machine learning model named Face Lock Algorithm with Gender and Age Classifier which will detect the face of the user using a face classifier called Haar Cascade Frontal Face classifier and will also provide an extra layer of security to mobile applications and websites by unlocking them only when the algorithm confirms the person as actual user. For this, it will first take the training data as an input from the camera of the device, then train the model based on the input and detect the face according to the training. Training will be done using LBPH (Local Binary Pattern Histogram) model which uses the concept of sliding window and applies the LBP operation on the image, which includes calculating pixel values of the image, finding threshold and then convert the image into binary. By doing so, all the important features of the image are extracted. Then it makes histograms for face recognition. In addition to this, after detecting the person's face, this algorithm will also classify the gender and gives a prediction about the age of the person. The primary advantage of this model is it makes use of a library called OpenCV for image capturing,

Hindawi
Computational and Mathematical Methods in Medicine
Volume 2021, Article ID 3900254, 10 pages
https://doi.org/10.1155/2021/3900254

123

Research Article

An Approach for Thoracic Syndrome Classification with Convolutional Neural Networks

Sapna Juneja,[1] **Abhinav Juneja**,[2] **Gaurav Dhiman**,[3] **Sanchit Behl**,[4] **and Sandeep Kautish**[5]

[1]*IMS Engineering College, Ghaziabad, India*
[2]*KIET Group of Institutions, Delhi NCR, Ghaziabad, India*
[3]*Govt. Bikram College of Commerce, Patiala, India*
[4]*BMIET, Sonepat, India*
[5]*LBEF Campus, Kathmandu, Nepal*

Correspondence should be addressed to Sandeep Kautish; dr.skautish@gmail.com

Received 2 July 2021; Revised 13 August 2021; Accepted 25 August 2021; Published 21 September 2021

Academic Editor: Hamidreza Mohafez

There have been remarkable changes in our lives and the way we perceive the world with advances in computing technology. Healthcare sector is evolving with the intervention of the latest computer-driven technology and has made a remarkable change in the diagnosis and treatment of various diseases. Due to many governing factors including air pollution, there is a rapid rise in chest-related diseases and the number of such patients is rising at an alarming rate. In this research work, we have employed machine learning approach for the detecting various chest-related problems using convolutional neural networks (CNN) on an open dataset of chest X-rays. The method has an edge over the traditional approaches for image segmentation including thresholding, *k*-means clustering, and edge detection. The CNN cannot scan and process the whole image at an instant; it needs to recursively scan small pixel spots until it has scanned the whole image. Spatial transformation layers and VGG19 have been used for the purpose of feature extraction, and ReLU activation function has been employed due to its inherent low complexity and high computation efficiency; finally, stochastic gradient descent has been used as an optimizer. The main advantage of the current method is that it retains the essential features of the image for prediction along with incorporating a considerable dimensional reduction. The model delivered substantial improvement over existing research in terms of precision, *f*-score, and accuracy of prediction. This model if used precisely can be very effective for healthcare practitioners in determining the thoracic or pneumonic symptoms in the patient at an early stage thus guiding the practitioner to start the treatment immediately leading to fast improvement in the health status of the patient.

1. Introduction

The chest carries the vital breath to be dissiminated in to the body parts which provides probably nearly all basic survival elements of the body. A huge number of individuals have been detected annually to suffer from chest ailments of various types on the planet. Tuberculosis (TB), chronic obstructive aspiratory disease (COPD), pneumonia, asthma, and lung disease infections are the most significant chest sicknesses, which have been also considered extremely normal diseases on the planet. Tuberculosis (TB) has been emerging as an omnipresent disease across the globe; this may be evidenced by the fact that in 2017, tuberculosis was responsible for the highest number of unnecessary deaths worldwide [1].

Radiographs popularly known as X-Rays have been used as one of the reliable sources for tracking the vital body parts over the decades. These radiographs have different sequences of evaluation for different body components. For chest X-rays, the evaluation for the lungs, heart, mediastinum, diaphragm, and bony thorax is performed to read the patients' condition while for the abdomen portion, an evaluation of bowel syndrome, psoas and nephritic issues, liver and spleen, and preperitoneal fat lines and a search for unusual calcination are done in order to find the patients'

122

Article

Analysis of Data Point Cloud Preprocessing and Feature Angle Detection Algorithm

September 2021 · Recent Advances in Electrical & Electronic Engineering (Formerly Recent Patents on Electrical & Electronic Engineering) 14(7)
DOI:10.2174/2352096514666210917150941

Authors:

Feng Zhao

Gaurav Dhiman
Government Bikram College of Commerce Patiala

References (1)

Abstract

Background The two main stages are utilized for feature extraction, from which the first stage consists of a penalty weight to the neighbor graph's edges. The edge penalty weights are minimized by the neighbor sub-graph extraction to produce the set of feature patterns. For noisy data, the second stage is helpful. Methodology In order to realize the measurement of the geometric dimensions of the ship block, this paper uses the theory of computer vision and reverse engineering to obtain the data of the segmented-hull with the method of digitizing the physical parts based on the vision, and processes the data by using the relevant knowledge of reverse engineering. Result The results show that the efficiency of the edge extraction algorithm based on mathematical morphology is 30% higher than that of the mesh generation method. An adaptive corner detection algorithm based on the edge can adaptively determine the size of the support area and accurately detect the corner position. Conclusion According to the characteristics of the point cloud of ship hull segment data, an adaptive corner detection algorithm based on the edge is adopted to verify its feasibility.

No full-text available

Govt. Bikram College of Commerce Patiala-147001 Punjab IQAC

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala

Hindawi

Complexity

121

Special Issue

Data-Enabled Intelligence in Complex Industrial Systems

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 4551067 | https://doi.org/10.1155/2021/4551067

Show citation

Identifying Major Research Areas and Minor Research Themes of Android Malware Analysis and Detection Field Using LSA

Deepak Thakur [1], **Jaiteg Singh** [1], Gaurav Dhiman [2], **Mohammad Shabaz** [1,3] and Tanya Gera [1]

Show more

Academic Editor: Long Wang

Published: 07 Sept 2021

Abstract

Contemporary technologies have ensured the availability of high-quality research data shared over the Internet. This has resulted in a tremendous availability of research literature, which keeps evolving itself. Thus, identification of core research areas and trends in such ever-evolving literature is not only challenging but interesting too. An empirical overview of contemporary machine learning methods, which have the potential to expedite evidence synthesis within research literature, has been explained. This manuscript proposes Simulating Expert comprehension for Analyzing Research trends (SEAR) framework, which can perform subjective and quantitative investigation over enormous literature. TRENDMINER is the use case designed exclusively for the SEAR framework. TRENDMINER uncovered the intellectual structure of a corpus of 444 abstracts of research articles (published during 2010–2019) on Android malware analysis and detection. The study concludes with the identification of three core research areas, twenty-seven research trends. The study also suggests the potential future research directions.

1. Introduction

Data are ubiquitous, whether they are on blogs, social media platforms, discussion forums, reviews, literature, or research studies. Extracting information out of such multidimensional data is not only important but also challenging too. There is a paradigm shift in knowledge transfer among different subareas of the research held. Manual systematic reviews [1] or semiautomated [2–4] are two methods that can be employed for systematic reviews. Manual reviews are more critical [5]. The selection of focus area, attributes' selections, and interpretation entirely depends on the expertise of the reviewer. Elaborating present trends and forecasting future directions from the existing literature is not only challenging but also time-consuming for systematic manual reviews. In contrast, semiautomated methods are more generic in finding the trends [6]. Deployment of machine learning techniques within semiautomated review methods can facilitate researchers to gain a dynamic review of any literature of choice. This manuscript offers an

Hindawi

Computational Intelligence and Neuroscience

120

Special Issue

Neural Network-Based Machine Learning in Data Mining for Big Data Systems

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 6455592 | https://doi.org/10.1155/2021/6455592

Show citation

Taxonomy of Adaptive Neuro-Fuzzy Inference System in Modern Engineering Sciences

Shivali Chopra [1], Gaurav Dhiman [2], Ashutosh Sharma [3], **Mohammad Shabaz** [4,5], Pratyush Shukla [6] and Mohit Arora [1]

Show more

Academic Editor: Syed Hassan Ahmed

Published: 06 Sept 2021

Abstract

Adaptive Neuro-Fuzzy Inference System (ANFIS) blends advantages of both Artificial Neural Networks (ANNs) and Fuzzy Logic (FL) in a single framework. It provides accelerated learning capacity and adaptive interpretation capabilities to model complex patterns and apprehends nonlinear relationships. ANFIS has been applied and practiced in various domains and provided solutions to commonly recurring problems with improved time and space complexity. Standard ANFIS has certain limitations such as high computational expense, loss of interpretability in larger inputs, curse of dimensionality, and selection of appropriate membership functions. This paper summarizes that the standard ANFIS is unsuitable for complex human tasks that require precise handling of machines and systems. The state-of-the-art and practice research questions have been discussed, which primarily focus on the applicability of ANFIS in the diversifying field of engineering sciences. We conclude that the standard ANFIS architecture is vastly improved when amalgamated with metaheuristic techniques and further moderated with nature-inspired algorithms through calibration and tuning of parameters. It is significant in adapting and automating complex engineering tasks that currently depend on human discretion, prominent in the mechanical, electrical, and geological fields.

1. Introduction

The machine learning domain contains a wide variety of models based on the learning ability, adaptiveness, complexity, and scalability. Some of the popular techniques are Fuzzy Logic, Extreme Learning Machine, Boosting, Bagging, Artificial Neural Networks, etc. Many researchers used machine learning algorithms based on these techniques like regression, decision trees, random forest, stochastic gradient, Support Vector Regressors (SVR), etc. and its ensembles other optimization techniques [1]. Hybrids of such techniques have been proposed and developed that tend to solve their deficiencies as well as provide robustness and powerful prediction capabilities. One such technique with the inherent potential of both neural networks and fuzzy

119

A PSO Enable Multi-Hop Clustering Algorithm for VANET

Ankit Temurnikar (Bhagwant University, India), Pushpneel Verma (Bhagwant University, India), and Gaurav Dhiman (Government Bikaram College of Commerce, India)

Source Title: International Journal of Swarm Intelligence Research (IJSIR) (/journal/international-journal-swarm-intelligence-research/1149) 13(2)

Pages: 14
DOI: 10.4018/IJSIR.20220401.oa7

Abstract

VANET (Vehicle Ad-hoc Network) is an emerging technology in today's intelligent transport system. In VANET, there are many moving nodes which are called the vehicle running on the road. They communicate with each other to provide the information to driver regarding the road condition, traffic, weather and parking. VANET is a kind of network where moving nodes talk with each other with the help of equipment. There are various other things which also make complete to VANET like OBU (onboard unit), RSU (Road Aside Unit) and CA (Certificate authority). In this paper, a new PSO enable multi-hop technique is proposed which helps in VANET to Select the best route and find the stable cluster head and remove the malicious node from the network to avoid the false messaging. The false can be occurred when there is the malicious node in a network. Clustering is a technique for making a group of the same type node. This proposed work is based on PSO enable clustering and its importance in VANET. While using this approach in VANET, it has increased the 20% packet delivery ratio.

Article Preview

Top

1. Introduction

Vehicle Ad-hoc Network one of the emerging technologies in the field of *ITS* (Intelligent Transport System). There are two classifications of this network: MANET and VANET. VANET plays an essential role in the area of ITS. A further category of VANET is V2V (Vehicle to Vehicle), V2I (Vehicle to infrastructure) and Hybrid V2I and V2V both. This research takes advantage of this communication. The main aim of VANET is to avoid the collision, share the traffic information and efficiently manage the available resource. VANET vehicles communicate with each other to share important information available. The vehicle is sharing information for communication with each other for solving the purpose of an intelligent transport system. Figure 1 shows the VANET architecture. It shows obvious how VANET communication takes place with the help of RSU, the Internet and OBU, how these devices communicate with each other.

Figure 1. VANET Architecture (Kumar et al.2018)
IJSIR.20220401.oa7.f01(https://igiprodst.blob.core.windows.net:443/source-content/9781683181521_278027/IJSIR.20220401.oa7.f01.png?sv=2015-12-11&sr=c&sig=h%2BW%2Fbt2qBTcGJFVkdNulmF11rBYcUL%2B2HqyR5oBLQDs%3D&se=2021-09-25T17%3A26%3A50Z&sp=r)

Top

2. Clustering

Clustering is a method of grouping the vehicle based on some predefined metrics such as velocity, density, and direction. Clustering is one of the control mechanisms in VANET. VANET is a MANET subclass, and many of the clustering technique is derived from MANET for VANET. Clustering in VANET has a highly dynamic topology that why most of the clustering algorithm is consider velocity and direction as an essential parameter for clustering. Clustering is a technique where each Cluster Head (CH) has a Cluster member (CM) and CG (cluster gateway). In clustering, each cluster member can become a cluster head (CH), but one can become a CH due to some condition in the algorithm.

2.1 PSO (Particle Swarm Optimization)

Hindawi

Security and Communication Networks

118

Special Issue

Security Algorithms and Risk Management using Fuzzy Sets

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 4229013 | https://doi.org/10.1155/2021/4229013

Show citation

An IoT-Based Water Level Detection System Enabling Fuzzy Logic Control and Optical Fiber Sensor

Yani Zheng,[1] Gaurav Dhiman,[2] Ashutosh Sharma,[3] Amit Sharma,[4] and **Mohd Asif Shah**[5]

Show more

Academic Editor: Qaisar Khan

Published: 27 Aug 2021

Abstract

The usage of wireless sensors has become widespread for the collection of data for various Internet of Things (IoT) products. Specific wireless sensors use optical fiber technology as transmission media and lightwave signals as carriers, showing the advantages of antielectromagnetic interference, high sensitivity, and strong reliability. Hence, their application in IoT systems becomes a research hotspot. In this article, multiple optical fiber sensors are constructed as an IoT detection system, and a Transmission Control Protocol (TCP)/Internet Protocol (IP) communication stack is used for the sensor module. Furthermore, design of gateway module, data server, and monitoring module is established in order to run the data server in the Windows system and communicate across the network segments. Furthermore, the optical fiber sensor is connected to the development board with WiFi, meanwhile considering the optical fiber wireless network's congestion problem. The fuzzy logic concept is introduced from the perspective of cache occupancy, and a fiber sensor's network congestion control algorithm is proposed. In the experiment, the IoT detection system with multiple optical fiber sensors is used for water level detection, and the sensor's real-time data detected by the User Interface (UI) are consistent with the feedback results. The proposed method is also compared with the SenTCP algorithm and the CODA algorithm, and it was observed that the proposed network congestion control algorithm based on the fuzzy logic can improve network throughput and reduce the network data packet loss.

1. Introduction

With the development of information technologies such as personal computer (PC), Internet, and mobile Internet, in the current information technology era, a new information technology era represented by the Internet of Things (IoT) [1–3] comes. The IoT [4, 5] concept was proposed by the International Telecommunication Union (ITU) in 2005. This technology regards mobile devices such as mobile phones, pads, smartwatches as networks to control them remotely in smart homes. A typical IoT-based system

ScienceDirect

Computers and Electrical Engineering
Volume 95, October 2021, 107378

117

Cooperative spectrum sensing optimization for cognitive radio in 6G networks

Krishna Kant Singh [a] ✉, Piyush Yadav [b], Akansha Singh [c], Gaurav Dhiman [d], Korhan Cengiz [e] ✉

Show more

Share Cite

https://doi.org/10.1016/j.compeleceng.2021.107378 ↗
Get rights and content ↗

Abstract

The upcoming sixth generation (6G) systems can meet the high user demands. The existing communication systems are becoming inefficient in meeting the user demands. The multifold growth in the usage of high-definition multimedia applications requires new capabilities. The users are looking forward to high throughput and low latency. The shift from 5G to 6G networks is since the 6G networks are expected to combine the terrestrial, aerial, and maritime communications into a robust network. This will provide the users a faster network with high reliability, accommodation to a larger number of users, and ultra-low latency. However, the limited availability of spectrum is a bottleneck in enhancing the user experience. Therefore, advanced techniques like cognitive radios and cooperative spectrum sensing are critical in the design of future network. The optimal usage and management of the available spectrum is significant for the performance of the network. In this paper, a cooperative spectrum sensing technique using Manta Ray Foraging Algorithm (MRFO) is proposed. The weighting vector at the fusion center is optimized using MRFO. The allocation of the spectrum is done using the optimal weight vector for secondary users. The proposed work aims at finding the maximum probability of detection. Probability of detection is significant in spectrum sensing. The channel needs to be sensed for the presence or absence of primary users. If the detection probability is maximized, then the channel usage efficiency will increase. The proposed method is compared with other state of the art methods. The results show that MRFO can be used efficiently for spectrum sharing by cognitive radios.

Graphical abstract

116

A comprehensive approach of hydrological issues related to ground water using GIS in the Hindu holy city of Gaya, India

Tarun Kumar Lohani, Melkamu Teshome Ayana, Abdella Kemal Mohammed, Mohammad Shabaz, Gaurav Dhiman, Vishal Jagota

World Journal of Engineering
ISSN: 1708-5284
Article publication date: 6 September 2021

(International Standard Serial Number.)

Abstract

Purpose

Gaya, the holy city of Hindus, Buddhists and Jains, is facing an acute shortage of potable water. Although the city is blessed with some static and dynamic water bodies all around the region, they do not fulfill the requirement of millions of public either inhabitants of the area or tourists or pilgrims flocking every day. Countless crowds, congested roads, swarming pedestrians, innumerable vehicles moving throughout the day and night have made the city into a non-livable one. The present status of surface water is a mere nightmare to the requirements of the people. Due to which, massive ground water pumping mostly illegally has added a grid in addition to the other socio-economic issues.

Design/methodology/approach

To focus on such problem, the ground water of the region was studied thoroughly by calculating the depth of water level, discharge, pre-and post-monsoon water table and specifically the storativity in ten different locations. Some data were acquired, others were assessed, and few are calculated to provide an overall view of the ground water scenario.

Findings

After a long and tedious field study, it was finally established from that static water level ranges from 2.45 to 26.59 m, below ground level (bgl), discharge varies from 3.21 m^3/day to 109.32 m^3/day. Post pumping drawdown falls between 0.83 m and 16.59 m, whereas the specific capacity lies in between 1.93 and 7.78 m^3/hr/m

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

IQAC
Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

Hindawi

Journal of Healthcare Engineering

115

Special Issue

The Use of Internet of Medical Things in Complex Data Analytics within Healthcare Systems

View this Special Issue

Review Article | Open Access

Volume 2021 | Article ID 4242646 | https://doi.org/10.1155/2021/4242646

Show citation

Gene Expression-Assisted Cancer Prediction Techniques

Tanima Thakur [1], **Isha Batra** [1], Monica Luthra [2], Shanmuganathan Vimal [3], Gaurav Dhiman [4], Arun Malik [1], and **Mohammad Shabaz** [5,6]

Show more

Academic Editor: Dmitry Zaitsev

Published: 19 Aug 2021

Abstract

Cancer is one of the deadliest diseases and with its growing number, its detection and treatment become essential. Researchers have developed various methods based on gene expression. Gene expression is a process that is used to convert deoxyribose nucleic acid (DNA) to ribose nucleic acid (RNA) and then RNA to protein. This protein serves so many purposes, such as creating cells, drugs for cancer, and even hybrid species. As genes carry genetic information from one generation to another, some gene deformity is also transferred to the next generation. Therefore, the deformity needs to be detected. There are many techniques available in the literature to predict cancerous and noncancerous genes from gene expression data. This is an important development from the point of diagnostics and giving a prognosis for the condition. This paper will present a review of some of those techniques from the literature; details about the various datasets on which these techniques are implemented and the advantages and disadvantages.

1. Introduction

DNA holds the genetic information of an organism for protein synthesis. The basic building block of DNA is called a nucleotide. It is made up of phosphate, deoxyribose, sugar, and four nitrate groups. These are generally inherited from parents to offspring, containing the genetic makeup required for the offspring to develop. The order in which these groups order themselves decides the traits of an organism, and this ordered arrangement is called a gene which is essential in protein synthesis. There are various types of DNA. A-DNA: DNA of this type is of right-handed double-helical type. DNA attains this configuration when short of moisture, dehydrated, or present in higher ionic concentrations. B-DNA: the standard format maintained by DNA during normal conditions in which life thrives, containing ten bases per rotation. C-DNA: complementary DNA is synthesized in a unique process called reverse transcription in the presence of a catalyst named transcriptase. D-DNA: it is an extremely rare configuration, and very little is known about it yet. E-DNA: DNA of this type is of left-handed double-helical type. DNA attains this configuration when it is present in higher salt concentrations. It is similar to A-DNA but is left-handed in structure.

Expert Systems / Early View / e12838

ORIGINAL ARTICLE

BOSS: A new QoS aware blockchain assisted framework for secure and smart healthcare as a service

Prabh Deep Singh, Rajbir Kaur, Gaurav Dhiman ✉, Giridhar Reddy Bojja

First published: 08 October 2021
https://doi.org/10.1111/exsy.12838
Citations: 6

Abstract

The latest epidemic of COVID-19 has significantly impacted both human capital and the global economy, contributing to pandemics and severe global crises. Research into the creation and propagation of the disease is desperately needed. The Internet of Things, cloud computing, and artificial intelligence offer modern technology for real-time processing for multiple applications such as healthcare applications, transport, traffic control, and so on blockchain is an evolving technology that will dramatically boost transaction protection in finance, supply chain, and other transaction networks. A stable and latency-sensitive Quality of Service framework for COVID-19 is the need of an hour. The purpose of this paper is to combine Fog computing and Artificial Intelligence with smart health to establish a reliable platform for early-stage detection of COVID-19 infection. A new ensemble-based classifier is proposed to detect COVID-19 patients. This research offers a blockchain platform to analyse how the unrelated cases of the COVID-19 virus can be tracked and identified using peer-to-peer, time stamping, and the shared storage advantages of blockchain. In addition to growing patient loyalty, this would effectively enhance the consistency, flexibility, productivity, performance, and effectiveness of healthcare services. The idea of blockchain is used to establish security for the whole framework. Different implementations measure the efficiency of the suggested system. The performance of the proposed framework is evaluated in terms of delay, network usages, RAM usages, and energy consumption. On the other hand, the classifier is evaluated in terms of classifier accuracy, recall, precision, kappa static, and root mean square error. The result shows the performance of the proposed framework and classifier is always better than the traditional frameworks and classifiers.

Open Research

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

113

Preprint PDF Available

Deep Reinforcement Learning and Performance Evaluation of Multi-layer Clustering Network with Enhanced Threshold Protocol

February 2021
DOI:10.21203/rs.3.rs-280261/v1
License - CC BY 4.0

Authors:

Jyothi Bhola

Dr. Mohammad Shabaz
Model Institute of Engineering and Technology

Gaurav Dhiman
Government Bikram College of Commerce Patiala

Vimal Shanmuga
Ramco Institute o

Show all 6 authors

References (9) Figures (6)

Abstract and Figures

In this research, pure deterministic system has been established by a new Distributed Energy Efficient Clustering Protocol with Enhanced Threshold (DEECET) by clustering sensor nodes to originate the Wireless Sensor Network. The DEECET is very dynamic, highly distributive, self-confessed and much energy efficient as compared to most of the other existing protocols. The MATLAB simulation provides aim proved result by means of energy dissipation being emulated in the networks lifespan for homogeneous as well as heterogeneous sensor network, which when contrasted for other traditional protocols. An enhanced result has been obtained for equitable energy dissipation for systematized networks using DEECET.

PEGASIS protocol | Network model diagram | Deployment of nodes in field | Clustering of network | Comparison between DEEC...

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

IQAC

Wireless Personal Communications manuscript No.
(will be inserted by the editor)

Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

Deep Reinforcement Learning and Performance Evaluation

Published: 07 September 2021

Energy-Effective and Secure Data Transfer Scheme for Mobile Nodes in Smart City Applications

Mukesh Soni, Gaurav Dhiman, Brajendra Singh Rajput, Rajan Patel & Nitesh Kumar Tejra

Wireless Personal Communications **127**, 2041–2061 (2022)

Abstract

Mobile nodes are deployed at different locations in the smart city to collect meaningful information so captured data can be used as an input in different smart city applications for society benefits. However, data is transferred through a public communication channel and thus, it is important to achieve specific security level to protect from malicious users in the network. There are various data transmission methods for mobile environments, but they are vulnerable against fundamental security attacks and the performance results are not effective for the mobile ad-hoc network. In this paper, we identify some security issues in Islam et al.'s scheme. To address found issues and improve the security and efficiency, we propose an energy-efficient and secure communication scheme for mobile node applications, achieving user identity privacy. We do security evaluations of the proposed protocol to confirm its strengths against various attacks. Further, we discuss performance analysis (for execution cost, energy consumption, communication overhead, and storage cost) for the suggested data transmission method and then to the comparison with other relevant communication mechanisms.

Article

Study on Automatic Tracking Method of Marking Points in Sports Image Sequence

November 2021 · Recent Advances in Electrical & Electronic Engineering (Formerly Recent Patents on Electrical & Electronic Engineering) 14(7):708-717
DOI:10.2174/2352096514666210719125126

Authors:

Cong Hua Pan

Gaurav Dhiman
Government Bikram College of Commerce Patiala

Abstract

Background The effect of teaching and training in physical sports is improved by the sports demonstration system. The two-dimensional sports demonstration system is widely applied for the training of athletes. In accurate motion positioning, there exists a certain visual deficiency and the two-dimensional sports demonstration system is analyzed by kinematics. Methodology Aiming at the problems in the real-time tracking of fast-moving targets in sports images, an automatic tracking method of sports images based on the registration of landmark points of the passive optical motion capture system is proposed. Moreover, it aims to build a human model and divide the human model into several limb segments; find the corresponding relationship between the first frame of motion data and template data to complete the first frame of motion data registration; based on the smallest non-rigid deformation and point set matching error, find the corresponding relationship between the current frame of motion data and the previous frame of registered motion data; through the mark points, follow up to complete the registration process of the marker. Results Experiments show that the average processing accuracy of this algorithm can reach over 85% and the processing time of a single frame of motion data is t<1/60s, which can meet real-time requirements. Conclusion The multi-point set least-squares matching algorithm is used to rigidly correct the registered landmark data. No manual intervention is required for the entire mark registration process.

Govt. Bikram College of Commerce, Patiala (Punjab) IQAC

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala.

Special Issue Paper | Published: 05 September 2021

Real time video summarizing using image semantic segmentation for CBVR

Rahul Jain, Pooja Jain, Tapan Kumar & Gaurav Dhiman

Journal of Real-Time Image Processing **18**, 1827–1836 (2021)

Abstract

Retrieving the exact video of choice in real time requires searching in annotated videos. Manual annotation is impossible for the huge data available nowadays. Hence, an effective model is proposed for summarizing the videos frame wise using stacked generalization to ensemble different machine learning algorithms. Also, the ranks are given to videos on the basis of the time a particular building or monument appears in the video. The videos are queried using KD tree. Semantic segmentation corresponds to the content of the video and hence the content based video retrieval.

109

Expert Systems / Volume 39, Issue 5 / e12815
ORIGINAL ARTICLE

Deep learning-influenced joint vehicle-to-infrastructure and vehicle-to-vehicle communication approach for internet of vehicles

M. S. Mekala, Gaurav Dhiman, Rizwan Patan ✉, Suresh Kallam, Kadiyala Ramana, Kusum Yadav, Ali O. Alharbi

First published: 24 October 2021
https://doi.org/10.1111/exsy.12815
Citations: 1

Correction added on 21 January 2022 after first online publication: Funding information section has been updated.

Funding information: This work was supported in part by Basic Science Research Programs of the Ministry of Education (GrantNRF -2018R1A2B6005105), and in part by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (No. 2019R1A5A8080290).

Abstract

The internet of vehicle (IoV) orchestration is an emerging technology in heterogeneous vehicles to contrivance diverse intelligent transportation applications. The roadside unit (RSU) plays a vital role during service provisioning. Vehicle-to-vehicle and vehicle-to-infrastructure communications have consistently accomplished the services in a vehicular network. However, persisting the increased vehicles' quality of experience and network vendors' utilities and which RSUs have to select for effective, reliable service are critical open research challenges to consolidate RSU services to enhance network service utility rate. In this article, we design a deep learning-inspired RSU Service Consolidation Approach based on two-models to enhance the service reliability by formulating the RSU coverage issue with the RSU Migration model and content delivery issue with Linear Programming-based Multicast model. Adaptive Packet-Error measurement system to optimize service reliability rate at the edge of cooperative vehicular network based on content correlation. The performance and efficiency are examined based on MATLAB. The simulation outcome shows RSC approach has low execution cost by 39%, service reliability rate by 71% than the state-of-art approaches.

Open Research

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ScienceDirect

Computers & Electrical Engineering
Volume 97, January 2022, 107606

Application of optimisation technique in PV integrated multilevel inverter for power quality improvement

Soumya Ranjan Das [a], Prakash K. Ray [b] ✉, A.K. Sahoo [c], Gaurav Dhiman [d] ✉

Show more

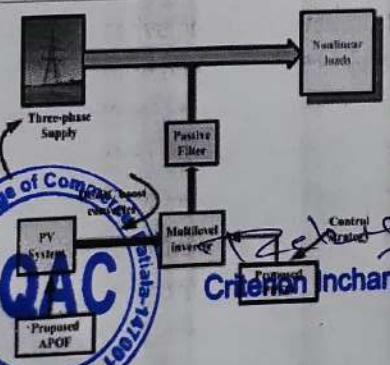
Share Cite

https://doi.org/10.1016/j.compeleceng.2021.107606
Get rights and content

Abstract

In recent days multilevel inverters (MI) have played an essential role in photovoltaic (PV) integrated supply systems. MI has high efficiency and is more robust compared to the traditional two-level inverter. This paper presents a modular cascaded multilevel inverters (MCMI)-based hybrid shunt active power filter (HSAPF) with PV integrated for power quality (PQ) improvement in three-phase utility systems. The main aim is to deliver the PV system's active power and reduce the current harmonics by injecting the compensation current at the point of intersection (POI). The main contributions in this work presents an optimization based approach called the predator-prey based fire-fly optimization (PPFO) for reducing the total harmonic distortions (THD) and, the Adaptive Perturb and Observe–Fuzzy (APOF) is developed for tracking the maximum power. The effectiveness of the PPFO is tested with other methods like particle swarm optimization (PSO) and fire-fly optimization (FO). The proposed technique is performed using MATLAB/ Simulink tool under different supply conditions.

Graphical abstracts



Download : Download high-res image (106KB)

ScienceDirect

Knowledge-Based Systems
Volume 229, 11 October 2021, 107348

An improved opposition-based marine predators algorithm for global optimization and multilevel thresholding image segmentation

Essam H. Houssein [a], Kashif Hussain [b], Laith Abualigah [c d], Mohamed Abd Elaziz [e], Waleed Alomoush [f], Gaurav Dhiman [g], Youcef Djenouri [h], Erik Cuevas [i]

Show more

https://doi.org/10.1016/j.knosys.2021.107348
Get rights and content

Abstract

A recent meta-heuristic algorithm called Marine Predators Algorithm (MPA) is enhanced using Opposition-Based Learning (OBL) termed MPA-OBL to improve their search efficiency and convergence. A comprehensive set of experiments are performed to evaluate the MPA-OBL and prove the impact influence of merging OBL strategy with the original MPA in enhancing the quality of the solutions and the acceleration of the convergence speed, using IEEE CEC'2020 benchmark problems as recently complex optimization benchmark. In order to evaluate the performance of the proposed MPA-OBL, the effectiveness of conjunction of OBL with the original MPA and the other counterparts are calculated and compared with LSHADE with semi-parameter adaptation hybrid with CMA-ES (LSHADE_SPACMA-OBL), Restart covariance matrix adaptation ES (CMA_ES-OBL), Differential evolution (DE-OBL), Harris hawk optimization (HHO-OBL), Sine cosine algorithm (SCA-OBL), Salp swarm algorithm (SSA-OBL), and the original MPA. The extensive results and comparisons in terms of optimization metrics have revealed the superiority of the proposed MPA-OBL in solving the IEEE CEC'2020 benchmark problems and improving the convergence speed. Moreover, as a sequel to the proposed MPA-OBL, also, we have conducted experiments using two objective functions of Otsu and Kapur's methods over a variety of benchmark images at different level of thresholds based on three commonly evaluation matrices namely Peak signal-to-noise ratio (PSNR), Structural similarity (SSIM), and Feature similarity (FSIM) indices are analyzed qualitatively and quantitatively. Eventually, the statistical post-hoc analysis reveal that the MPA-OBL obtains highly efficient and reliable results in comparison with the other competitor algorithms.

Introduction

IET Communications / Volume 16, Issue 5 / p. 464-475
ORIGINAL RESEARCH PAPER | Open Access

106

An IoT and machine learning-based routing protocol for reconfigurable engineering application

Yuvaraj Natarajan, Kannan Srihari, Gaurav Dhiman, Selvaraj Chandragandhi, Mehdi Gheisari, Yang Liu, Cheng-Chi Lee, Krishna Kant Singh, Kusum Yadav, Hadeel Fahad Alharbi

First published: 05 August 2021
https://doi.org/10.1049/cmu2.12266
Citations: 7

Abstract

With new telecommunications engineering applications, the cognitive radio (CR) network-based internet of things (IoT) resolves the bandwidth problem and spectrum problem. However, the CR-IoT routing method sometimes presents issues in terms of road finding, spectrum resource diversity and mobility. This study presents an upgradable cross-layer routing protocol based on CR-IoT to improve routing efficiency and optimize data transmission in a reconfigurable network. In this context, the system is developing a distributed controller which is designed with multiple activities, including load balancing, neighbourhood sensing and machine-learning path construction. The proposed approach is based on network traffic and load and various other network metrics including energy efficiency, network capacity and interference, on an average of 2 bps/Hz/W. The trials are carried out with conventional models, demonstrating the residual energy and resource scalability and robustness of the reconfigurable CR-IoT.

1 INTRODUCTION

Wireless networks reconfigurable (RWN) is mainly an adaptive network firmware developed to satisfy the demands of modern applications, changing network topologies and changing network conditions. In particular, the RWM can be reconfigured throughout all protocol stack tiers (i.e. physical, media access, network, transport and application layers). In order to promote high mobility of time scenarios, this reconfiguration imposes the burden on their transport layer routing protocol with a reconfigurable approach to building high-quality service (QoS) in heterogeneous networks or with the application requirement [1].

The new communication technology cognitive radio (CR) tends to make the secondary or CR understand its environment intelligently and, depending on the information received with respect to (w.r.t.) the rising usage of spectrum resources, then the parameters are appropriately modified. It can also be construed to give CRs the ability to detect the available spectrum from the environment, then the channel sets are divided in order to optimize the selection of the channel that gives up interference with secondary users (SU) [2]. The SU holds the responsibility of finding the range of transmission of the primary user (PU) and also avoids interference with PUs [3]. Further, the intelligent SU explores the optimal spectral resource thereby reducing the interference even during the transmission over PU. The spectral sensing by the intelligent SU offers more opportunities for spectra access. Depending on optimal spectral sensing, optimal quality assessment on available channels and optimal PU detection,

Published: 18 September 2021

105

Mobile Networks-on-Chip Mapping Algorithms for Optimization of Latency and Energy Consumption

Arvind Kumar, Vivek Kumar Sehgal, Gaurav Dhiman ✉, S. Vimal, Ashutosh Sharma & Sangoh Park

Mobile Networks and Applications **27**, 637–651 (2022)

Abstract

With the advancement in technology, it is now possible to integrate hundreds of cores onto single silicon semiconductor chip or silicon die. In order to provide communication between these cores, large number of resources are required and it leads to the communication problem in System-on- Chip (SoC), which is solved by introduction of Networks-on-Chip (NoC). NoC proves to be most efficient in terms of flexibility, scalability and parallelism. In this paper, the proposed mapping algorithms, Horological Mapping (HorMAP), Rotational Mapping (RtMAP) and Divide and Conquer Mapping (DACMAP) for mapping of tasks onto cores, basically concentrate on the optimization of latency, queuing time, service time and energy consumption of topology at constant bandwidth required. The experimental results discussed in this paper shows the comparison of proposed algorithms with traditional random mapping algorithm. In this paper, 2D mesh topology with XY routing is considered for the simulation of proposed algorithms.

IQAC Govt. Bikram College of Commerce, Patiala-147001 Punjab

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala.

ScienceDirect

Expert Systems with Applications
Volume 184, 1 December 2021, 115481

104

Opposition-based moth swarm algorithm

Diego Oliva [a b 1], Sara Esquivel-Torres [a], Salvador Hinojosa [a], Marco Pérez-Cisneros [a], Valentín Osuna-Enciso [a], Noé Ortega-Sánchez [a], Gaurav Dhiman [c], Ali Asghar Heidari [d e 2]

Show more

https://doi.org/10.1016/j.eswa.2021.115481
Get rights and content

Abstract

Nowadays, resource-optimizing techniques are required in many engineering areas to obtain the most appropriate solutions for complex problems. For this reason, there is a trend among researchers to improve existing swarm-based algorithms through different evolutionary techniques and to create new population-based methods that can accurately explore the feature space. The recently proposed Moth swarm algorithm (MSA) inspired by the orientation of moths towards moonlight is an associative learning mechanism with immediate memory that uses Lévy mutation to cross-population diversity and spiral movement. The MSA is a population-based method used for tackling complex optimization problems. It presents an adequate capacity for exploration and exploitation trends; however, due to its nature of operators, this type of method is prone to get stuck in sub-optimal locations, which affects the speed of convergence and the computational effort to reach better solutions. To mitigate these shortcomings, this paper proposes an improved MSA that combines opposition-based learning (OBL) as a mechanism to enhance the exploration drifts of the basic version and increase the speed of convergence to obtain more accurate solutions. The proposed approach is called OBMSA. It has been tested for solving three classic engineering design problems (welded beam, tension/compression spring, and pressure vessel designs) with constraints, 19 benchmark functions comprising 7 unimodal, 6 multimodal, and 6 composite functions. Experimental results and comparisons provide evidence that the performance and accuracy of the proposed method are superior to the original MSA. We hope the community utilizes the proposed MSA-based approach for solving other complex problems.

Introduction

Hindawi

Wireless Communications and Mobile Computing

103

Special Issue

AI-Based Federated Learning for 6G Mobile Networks

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 5512879 | https://doi.org/10.1155/2021/5512879

Show citation

Scalable and Storage Efficient Dynamic Key Management Scheme for Wireless Sensor Network

Vipin Kumar ✉ [1], Navneet Malik [1], Gaurav Dhiman [2] and Tarun Kumar Lohani [3]

Show more

Academic Editor: Vimal Shanmuganathan

Published: 01 Jul 2021

Abstract

Recently, there have been exploratory growth in the research of wireless sensor network due to wide applications like health monitoring, environment monitoring, and urban traffic management. Sensor network applications have been used in habitat monitoring, border monitoring, health care, and military surveillance. In some applications, the security of these networks is very essential and need robust support. For a network, it is very important that node in the network trust each other and malicious node should be discarded. Cryptography techniques are normally used to secure the networks. Key plays a very important role in network security. Other aspects of security such as integrity, authentication, and confidentiality also depend on keys. In wireless sensor network, it is very difficult to manage the keys as this includes distribution of key, generation of new session key as per requirements, and renewal or revoke the keys in case of attacks. In this paper, we proposed a scalable and storage efficient key management scheme (SSEKMS) for wireless sensor networks that establish the three types of keys for the network: a network key that is shared by all the nodes in the network, a cluster key shared for a cluster, and pairwise key for each pair of nodes. We analysed the resiliency of the scheme (that is the probability of key compromise against the node capture) and compared it with other existing schemes. SSEKMS is a dynamic key management system that also supports the inclusion of the new node and refreshes the keys as per requirements.

1. Introduction

Sensor networks are very popular for collecting information and monitoring activities in hostile areas. In sensor networks, small sensors collect the data like humidity, temperature, pressure, and movements from physical environment. Through a gateway, this information is sent to the sink [1]. A large number of sensors are implemented, and in account of its wireless nature, they easily work in different environmental conditions. Sensors may be deployed in a random manor so it is important to deploy them carefully. If there are less number of nodes in the area, it may lead to the unattended area or less connectivity of network, and if more nodes are deployed, there will be high traffic in the network and high collision rate of interference

Hindawi

Computational Intelligence and Neuroscience

102

Special Issue

Computational Intelligence for Medical Internet of Things (MIoT) Applications

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 8387680 | https://doi.org/10.1155/2021/8387680

Show citation

Prediction of Heart Disease Using a Combination of Machine Learning and Deep Learning

Rohit Bharti [1], Aditya Khamparia [2], **Mohammad Shabaz** [3], Gaurav Dhiman [4], Sagar Pande [1] and Parneet Singh [5]

Show more

Academic Editor: Ahmed A. Abd El-Latif

Published: 01 Jul 2021

Abstract

The correct prediction of heart disease can prevent life threats, and incorrect prediction can prove to be fatal at the same time. In this paper different machine learning algorithms and deep learning are applied to compare the results and analysis of the UCI Machine Learning Heart Disease dataset. The dataset consists of 14 main attributes used for performing the analysis. Various promising results are achieved and are validated using accuracy and confusion matrix. The dataset consists of some irrelevant features which are handled using Isolation Forest, and data are also normalized for getting better results. And how this study can be combined with some multimedia technology like mobile devices is also discussed. Using deep learning approach, 94.2% accuracy was obtained.

1. Introduction

Heart disease describes a range of conditions that affect your heart. Today, cardiovascular diseases are the leading cause of death worldwide with 17.9 million deaths annually, as per the World Health Organization reports [1]. Various unhealthy activities are the reason for the increase in the risk of heart disease like high cholesterol, obesity, increase in triglycerides levels, hypertension, etc. [1]. There are certain signs which the American Heart Association [2] lists like the persons having sleep issues, a certain increase and decrease in heart rate (irregular heartbeat), swollen legs, and in some cases weight gain occurring quite fast; it can be 1-2 kg daily [2]. All these symptoms resemble different diseases also like it occurs in the aging persons, so it becomes a difficult task to get a correct diagnosis, which results in fatality in near future.

But as time is passing, a lot of research data and patients records of hospitals are available. There are many open sources for accessing the patient's records and researches can be conducted so that various computer technologies could be used for doing the correct diagnosis of the patients and detect this disease to stop it from becoming fatal. Nowadays it is well known that machine learning and artificial intelligence are playing

IQAC Criterion Incharge Co-ordinator NAAC Govt. Bikram College of Commerce, Patiala Principal

ScienceDirect

Informatics in Medicine Unlocked
Volume 26, 2021, 100636

101

Fog-centric IoT based smart healthcare support service for monitoring and controlling an epidemic of Swine Flu virus

Prabh Deep Singh [a], Rajbir Kaur [b], Kiran Deep Singh [c], Gaurav Dhiman [d], Mukesh Soni [e]

Show more

Outline | Share Cite

https://doi.org/10.1016/j.imu.2021.100636
Get rights and content

Abstract

Disease detection is a time-consuming and essential task in the medical diagnosis system. Machine learning plays a vital role in predicting and identifying diseases at various stages. It is a very random and timely method for analyzing disease using clinical and laboratory signs and assists medical representatives in developing a more effective diagnostic strategy for such diseases. For example, swine flu, a contagious illness caused by influenza viruses, including the H1N1 virus, infects the respiratory tract of pigs, causing a barking cough, decreased appetite, nasal secretions, and uncontrollable behaviour. Cloud computing and the Internet of things help the medical sector by processing health information in ultra-low delay so that effective decisions can be taken timely. In this paper, a fog-centric IoT-based smart healthcare support service for monitoring and controlling the Swine Flu virus epidemic is proposed. The proposed framework utilizes the concept of fog computing for delay-sensitive applications. Furthermore, a hybrid classifier is used to classify the swine flu patient at an early stage and generate alerts to the health officials and patients' guardians. In the experimental setup, the iFogSim simulator is used to mimic the IoT devices and fog nodes for evaluating various parameters such as accuracy, energy, and Latency, whereas WEKA is used for developing a hybrid classifier. Results demonstrate the benefits of combining fog and cloud computing services to achieve higher network bandwidth reliability, a higher level of operation, and a shorter response time while generating real-time notifications, as compared to an existing cloud-only model.

Previous Next

Keywords

Machine learning; COVID-19; Artificial intelligence; Quality of service; Corona virus; Ensemble classifier

1. Introduction

Using the Internet of Things, cellular networks, big data, and other sensors have created a modern cloud computing infrastructure. However, these devices fail to meet the needs of modern medical data storage needs [1]. Research on the healthcare industry develops quickly with massive quantities of data. However, the massive range of data makes it difficult for existing networks to provide insight and reviews.

It is pretty evident that due to globalization, the distribution of animal products all over the world has become more rapid, posing severe threats to humanity as infections such as swine fevers can spread

Hindawi

Journal of Food Quality

100

Special Issue

Artificial Intelligence in Food Quality Improvement

View this Special Issue

Review Article | Open Access

Volume 2021 | Article ID 7608296 | https://doi.org/10.1155/2021/7608296

Show citation

Application of Blockchain and Internet of Things in Healthcare and Medical Sector: Applications, Challenges, and Future Perspectives

Pranav Ratta [1], Amanpreet Kaur [1], Sparsh Sharma [2], **Mohammad Shabaz** [3], and Gaurav Dhiman [4]

Show more

Academic Editor: Rijwan Khan

Published: 25 May 2021

Abstract

Internet of Things (IoT) is one of the recent innovations in Information Technology, which intends to interconnect the physical and digital worlds. It introduces a vision of smartness by enabling communication between objects and humans through the Internet. IoT has diverse applications in almost all sectors like Smart Health, Smart Transportation, and Smart Cities, etc. In healthcare applications, IoT eases communication between doctors and patients as the latter can be diagnosed remotely in emergency scenarios through body sensor networks and wearable sensors. However, using IoT in healthcare systems can lead to violation of the privacy of patients. Thus, security should be taken into consideration. Blockchain is one of the trending research topics nowadays and can be applied to the majority of IoT scenarios. Few major reasons for using the Blockchain in healthcare systems are its prominent features, i.e., Decentralization, Immutability, Security and Privacy, and Transparency. This paper's main objective was to enhance the functionality of healthcare systems using emerging and innovative computer technologies like IoT and Blockchain. So, initially, a brief introduction to the basic concepts of IoT and Blockchain is provided. After this, the applicability of IoT and Blockchain in the medical sector is explored in three major areas—drug traceability, remote patient-monitoring, and medical record management. At last, the challenges of deploying IoT and Blockchain in healthcare systems are discussed.

1. Introduction

The Healthcare sector is a critical concern for all the developing as well as developed countries because this sector is directly concerned with the social welfare and lives of people. Research and development in the Healthcare sector should be an ongoing process, as it will help to improve the quality of living by fighting various health issues and diseases. With the advancement and recent developments in technology, the improvement in the Healthcare sector can be seen easily. The existing capabilities of the Healthcare and

Hindawi

Wireless Communications and Mobile Computing

Special Issue

AI-Based Federated Learning for 6G Mobile Networks

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 5583874 | https://doi.org/10.1155/2021/5583874

Show citation

A New Hybrid Deep Learning Algorithm for Prediction of Wide Traffic Congestion in Smart Cities

G. Kothai,[1] E. Poovammal,[1] Gaurav Dhiman,[2] Kadiyala Ramana,[3] Ashutosh Sharma,[4] Mohammed A. AlZain,[5] Gurjot Singh Gaba,[6] and **Mehedi Masud**[7]

Show more

Academic Editor: VIMAL SHANMUGANATHAN

Published: 20 May 2021

Abstract

The vehicular adhoc network (VANET) is an emerging research topic in the intelligent transportation system that furnishes essential information to the vehicles in the network. Nearly 150 thousand people are affected by the road accidents that must be minimized, and improving safety is required in VANET. The prediction of traffic congestions plays a momentous role in minimizing accidents in roads and improving traffic management for people. However, the dynamic behavior of the vehicles in the network degrades the rendition of deep learning models in predicting the traffic congestion on roads. To overcome the congestion problem, this paper proposes a new hybrid boosted long short-term memory ensemble (BLSTME) and convolutional neural network (CNN) model that ensemble the powerful features of CNN with BLSTME to negotiate the dynamic behavior of the vehicle and to predict the congestion in traffic effectively on roads. The CNN extracts the features from traffic images, and the proposed BLSTME trains and strengthens the weak classifiers for the prediction of congestion. The proposed model is developed using Tensor flow python libraries and are tested in real traffic scenario simulated using SUMO and OMNeT++. The extensive experimentations are carried out, and the model is measured with the performance metrics likely prediction accuracy, precision, and recall. Thus, the experimental result shows 98% of accuracy, 96% of precision, and 94% of recall. The results complies that the proposed model clobbers the other existing algorithms by furnishing 10% higher than deep learning models in terms of stability and performance.

1. Introduction

The vehicular adhoc network is a puissant research applications in the intelligent transportation system (ITS) that furnishes the information to prevent or reduce the traffic congestion. For exchanging the information in a network, the vehicular adhoc network has vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication. When a conveyance directly communicates with other conveyance in a network is V2V communication and when a conveyance directly communicates with roadside units (RSU),

International Journal of Intelligent Systems / Volume 37, Issue 12 / p. 10336-10379

RESEARCH ARTICLE

98

A range-free localization algorithm for IoT networks

Saeid Barshandeh ✉, Mohammad Masdari, Gaurav Dhiman, Vahid Hosseini, Krishna K. Singh

First published: 14 June 2021
https://doi.org/10.1002/int.22524
Citations: 5

Abstract

Internet of things (IoT) is a ubiquitous network that helps the system to monitor and organize the world through processing, collecting, and analyzing the data produced by IoT objects. The accurate localization of IoT objects is indispensable for most IoT applications, especially healthcare monitoring. Utilizing GPS as the positioning system is not cost-efficient and does not apply to some environments (e.g., deep forests, oceans, inside the buildings, etc.). Hereupon, copious position estimation approaches are developed in the literature. Among range-free approaches, distance vector-Hop (DV-Hop) is the widely used algorithm due to its straightforward applicability and can estimate the position of unknown objects that are far-off the anchors. Due to its low accuracy, various techniques were proposed to increase the accuracy of basic DV-Hop. In the most recent approach, meta-heuristic algorithms were used, the results of which were promising. In the present paper, Tunicate Swarm Algorithm and Harris hawk optimization were initially hybridized. Afterthought, the resulting hybrid algorithm was enhanced by appending a new phase. Then, the proposed hybrid algorithm was intermingled with the DV-Hop algorithm. In the first set of experiments, the proposed hybrid algorithm was evaluated on 50 test functions using average, *SD*, box plot, and p-value criteria. In the second part, the proposed localization algorithm's efficiency was investigated in twenty-eight different manners using node localization error, average localization error, and localization error variance metrics. The effectiveness of the contributions was evident from the experimental results.

ScienceDirect

Materials Today: Proceedings

Available online 28 May 2021

Withdrawn Article in Press What's this?

97

Withdrawal Notice

WITHDRAWN: A short survey of co-builders web framework

Jaswinder Singh [a], Gaurav Dhiman [b]

Show more

Share Cite

https://doi.org/10.1016/j.matpr.2021.05.333

This article has been withdrawn: please see Elsevier Policy on Article Withdrawal (https://www.elsevier.com/about/our-business/policies/article-withdrawal).

This article has been withdrawn as part of the withdrawal of the Proceedings of the International Conference on Emerging Trends in Materials Science, Technology and Engineering (ICMSTE2K21). Subsequent to acceptance of these Proceedings papers by the responsible Guest Editors, Dr S. Sakthivel, Dr S. Karthikeyan and Dr I. A. Palani, several serious concerns arose regarding the integrity and veracity of the conference organisation and peer-review process. After a thorough investigation, the peer-review process was confirmed to fall beneath the high standards expected by Materials Today: Proceedings.

The veracity of the conference also remains subject to serious doubt and therefore the entire Proceedings has been withdrawn in order to correct the scholarly record.

Govt. Bikram College of Commerce, Patiala-147001 Punjab IQAC

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala

ScienceDirect

Materials Today: Proceedings

Available online 22 May 2021

Withdrawn Article in Press What's this?

96

Withdrawal Notice

WITHDRAWN: Review of ECG arrhythmia classification using deep neural network

Deepak Gupta [a], Bhavna Bajpai [b], Gaurav Dhiman [c], Mukesh Soni [d], S. Gomathi [e], Dadaso Mane [a]

Show more

Share Cite

https://doi.org/10.1016/j.matpr.2021.05.249

This article has been withdrawn: please see Elsevier Policy on Article Withdrawal (https://www.elsevier.com/about/our-business/policies/article-withdrawal).

This article has been withdrawn as part of the withdrawal of the Proceedings of the International Conference on Emerging Trends in Materials Science, Technology and Engineering (ICMSTE2K21). Subsequent to acceptance of these Proceedings papers by the responsible Guest Editors, Dr S. Sakthivel, Dr S. Karthikeyan and Dr I. A. Palani, several serious concerns arose regarding the integrity and veracity of the conference organisation and peer-review process. After a thorough investigation, the peer-review process was confirmed to fall beneath the high standards expected by Materials Today: Proceedings.

The veracity of the conference also remains subject to serious doubt and therefore the entire Proceedings has been withdrawn in order to correct the scholarly record.

Govt. Bikram College of Commerce, Patiala-147001 IQAC Punjab

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala.

ScienceDirect

Materials Today: Proceedings

Available online 26 May 2021

Withdrawn Article in Press What's this?

95

Withdrawal Notice

WITHDRAWN: A survey on cloud computing approaches

Jaswinder Singh [a], Gaurav Dhiman [b]

Show more

Share Cite

https://doi.org/10.1016/j.matpr.2021.05.334

This article has been withdrawn: please see Elsevier Policy on Article Withdrawal (https://www.elsevier.com/about/our-business/policies/article-withdrawal).

This article has been withdrawn as part of the withdrawal of the Proceedings of the International Conference on Emerging Trends in Materials Science, Technology and Engineering (ICMSTE2K21). Subsequent to acceptance of these Proceedings papers by the responsible Guest Editors, Dr S. Sakthivel, Dr S. Karthikeyan and Dr I. A. Palani, several serious concerns arose regarding the integrity and veracity of the conference organisation and peer-review process. After a thorough investigation, the peer-review process was confirmed to fall beneath the high standards expected by Materials Today: Proceedings.

The veracity of the conference also remains subject to serious doubt and therefore the entire Proceedings has been withdrawn in order to correct the scholarly record.

Govt. Bikram College of Commerce, Patiala-147001 * Punjab * IQAC

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala.

94

Expert Systems / Volume 39, Issue 5 / e12753

SURVEY ARTICLE

Conceptualizing smart city applications: Requirements, architecture, security issues, and emerging trends

A. K. M. Bahalul Haque, Bharat Bhushan ✉, Gaurav Dhiman

First published: 11 June 2021
https://doi.org/10.1111/exsy.12753
Citations: 23

Correction added on 5 July 2021, after first online publication: Affiliation for the 3rd author has been corrected in this version.

Abstract

The emergence of smart cities and sustainable development has become a globally accepted form of urbanization. The epitome of smart city development has become possible due to the latest innovative integration of information and communication technology. Citizens of smart cities can enjoy the benefits of a smart living environment, ubiquitous connectivity, seamless access to services, intelligent decision making through smart governance, and optimized resource management. The widespread acceptance of smart cities has raised data security issues, authentication, unauthorized access, device-level vulnerability, and sustainability. This article focuses on the holistic overview and conceptual development of smart city. Initially, the work discusses the smart city idea and fundamentals explored in various pieces of literature. Further various smart city applications along with notable implementations, are put forth to understand the quality of living standards. Finally, the article depicts a solid understanding of different security and privacy issues, including some crucial future research directions.

CONFLICT OF INTEREST

There is no conflict of interest. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Open Research

Govt. Bikram College of Commerce, Patiala. IQAC

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala

ScienceDirect

Materials Today: Proceedings

Available online 28 May 2021

Withdrawn Article in Press ⓘ What's this?

93

Withdrawal Notice

WITHDRAWN: A survey on machine-learning approaches: Theory and their concepts

Jaswinder Singh [a], Gaurav Dhiman [b]

Show more

Share Cite

https://doi.org/10.1016/j.matpr.2021.05.335

This article has been withdrawn: please see Elsevier Policy on Article Withdrawal (https://www.elsevier.com/about/our-business/policies/article-withdrawal).

This article has been withdrawn as part of the withdrawal of the Proceedings of the International Conference on Emerging Trends in Materials Science, Technology and Engineering (ICMSTE2K21). Subsequent to acceptance of these Proceedings papers by the responsible Guest Editors, Dr S. Sakthivel, Dr S. Karthikeyan and Dr I. A. Palani, several serious concerns arose regarding the integrity and veracity of the conference organisation and peer-review process. After a thorough investigation, the peer-review process was confirmed to fall beneath the high standards expected by Materials Today: Proceedings.

The veracity of the conference also remains subject to serious doubt and therefore the entire Proceedings has been withdrawn in order to correct the scholarly record.

Govt. Bikram College of Commerce, Patiala-147001 Punjab IQAC

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala.

Hindawi

Wireless Communications and Mobile Computing

92

Special Issue

Internet of Things in Multimedia Communication Systems

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 5592454 | https://doi.org/10.1155/2021/5592454

Show citation

A Detailed Research on Human Health Monitoring System Based on Internet of Things

Lei Ru [1], **Bin Zhang** [2], Jing Duan [3], Guo Ru [4], Ashutosh Sharma [5], Gaurav Dhiman,[6] Gurjot Singh Gaba [7], Emad Sami Jaha,[8] and **Mehedi Masud** [9]

Show more

Academic Editor: Deepak Gupta

Published: 15 May 2021

Abstract

The technological advent in smart sensing devices and the Internet has provided practical solutions in various sectors of networking, public and private sector industries, and government organizations worldwide. This study intends to combine the Internet of Things (IoT) technology with health monitoring to make it personalized and timely through allowing the interconnection between the devices. This work is aimed at exploring various wearable health monitoring modules that people wear to monitor heart rate, blood pressure, pulse, body temperature, and physiological information. The information is acquired using the wireless sensor to create a health monitoring system. The data is integrated using the Internet of Things for processing, connecting, and computing to achieve real-time monitoring. The temperature of three people measured by the temperature thermometer is 36.4, 36.7, and 36.5 (°C), respectively, and the average acquired by the monitoring system of the three people is 36.5, 36.4, and 36.5 (°C), respectively, indicating that the system demonstrated relatively accurate and stable testability. The user's ECG is displayed clearly and conveniently using the ECG acquisition system. The pulse rate of the three people tested by the system is 78, 78, and 79 (times/min), respectively, similar to the medical pulse meter results. The physiological information acquired using the semantic recognition, matching system, and character matching system is relatively accurate. It concludes that the human health monitoring system based on the Internet of Things can provide people with daily health management, instrumental in heightening health service quality and level.

1. Introduction

In 2014, the *Report on the Status of Chinese Residents' Nutrition and Chronic Diseases* issued by the Ministry of Health pointed out that the mortality rate of chronic diseases, represented by cardiovascular diseases and diabetes, is about 85.5% each year, and chronic diseases account for about 75% of all diseases in China [1]. Internet healthcare focuses on chronic high-risk diseases and subhealthy groups due to many subhealthy groups, together with the long course, complex etiology, and high treatment costs of chronic

ScienceDirect

Computers and Electrical Engineering
Volume 95, October 2021, 107436

Risk-aware optimized quickest path computing technique for critical routing services

Ashutosh Sharma [a], Piotr Cholda [b], Rajiv Kumar [c], Gaurav Dhiman [d]

Show more

Share Cite

https://doi.org/10.1016/j.compeleceng.2021.107436
Get rights and content

Abstract

In this paper, a novel model has been proposed for the computation of optimized path with link reliability, delay and capacity. Algorithms have been proposed for the optimized data path with a single link-weight and it constitutes two main parts: (i) characterization of the network for the best optimized path, and (ii) tuning of the network parameters for the prediction/validation for the Best Optimized Path, according to a given data flow. It also needs very little a priori information during the online computation as the computed optimized path requires less computational overhead as each data flow shall be assigned with a precomputed and optimized link weight. Now, with the help of this optimized link weight one can find the optimum path with respect to both risk and lag-time in an online approach simply by adopting the Dijkstra's algorithm. This approach has been illustrated here in this paper with the help of two different topologies for different values of data flow from single source to single destination. Algorithms have been proposed based on this mathematical model. It also can be observed that proposed algorithms are able to compute the optimized path with having complexity of Dijkstra's algorithm when computer together. This study can be claimed that the proposed algorithms are self-sufficient to provide the risk-aware quickest path routing, even without having any prior information on the path to be allocated. One can easily extend it for the case of many source nodes to the many destination nodes as well as for the software defined networking (SDN) in the future work.

Graphical abstract

Review article | Published: 07 May 2021

90

Big Data Processing and Analysis in Internet of Vehicles: Architecture, Taxonomy, and Open Research Challenges

Ansif Arooj, Muhammad Shoaib Farooq ✉, Aftab Akram, Razi Iqbal, Ashutosh Sharma & Gaurav Dhiman

Archives of Computational Methods in Engineering **29**, 793–829 (2022)

A Correction to this article was published on 25 May 2021

This article has been updated

Abstract

The extensive progression in the Internet of Vehicles (IoV) and the exponential upsurge in data consumption reflect the importance of big data in IoV. In general, big data has gained a significant attraction in academia and industry to provide valuable business intelligence and evidence-based decisions. This has been a key enabler for the advancement of the Internet of Vehicles (IoV) in which big data can be leveraged for efficient processing and valuable decisions. Moreover, data acquired from connected vehicles, traffic monitoring, social media feeds, and, crowd-sourcing can strengthen urban development and management. The purpose of this study is to synthesize a systematic review of all related research articles from January 2014 to September 2020 in well-alleged venues. We have rigorously surveyed the research papers to understand potential opportunities,

Urban Rain Flood Ecosystem Design Planning and Feasibility Study for the Enrichment of Smart Cities

by Yixin Zhou[1,*], Ashutosh Sharma[2,*], Mehedi Masud[3,*], Gurjot Singh Gaba[4], Gaurav Dhiman[5], Kayhan Zrar Ghafoor[6] and Mohammed A. AlZain[7]

[1] College of Water Conservancy and Civil Engineering, South China Agricultural University, Guangzhou 510642, China
[2] Institute of Computer Technology and Information Security, Southern Federal University, 344006 Rostov Oblast, Russia
[3] Department of Computer Science, College of Computers and Information Technology, Taif University, Taif 21944, Saudi Arabia
[4] School of Electronics and Electrical Engineering, Lovely Professional University, Phagwara 144411, India
[5] Government Bikram College of Commerce, Punjab 147001, India
[6] Department of Computer Science, Knowledge University, Erbil 44001, Iraq
[7] Department of Information Technology, College of Computers and Information Technology, Taif University, Taif 21944, Saudi Arabia
* Authors to whom correspondence should be addressed.

Sustainability **2021**, *13*(9), 5205; **https://doi.org/10.3390/su13095205**

88

Interdiscip Sci. 2022 Mar;14(1):34-44. doi: 10.1007/s12539-021-00450-7. Epub 2021 Jul 5.

The Application of Convolutional Neural Network Model in Diagnosis and Nursing of MR Imaging in Alzheimer's Disease

Xiaoxiao Chen [1], Linghui Li [2], Ashutosh Sharma [3], Gaurav Dhiman [4], S Vimal [5]

Affiliations

PMID: 34224083 DOI: 10.1007/s12539-021-00450-7

Abstract

The disease Alzheimer is an irrepressible neurologicalbrain disorder. Earlier detection and proper treatment of Alzheimer's disease can help for brain tissue damage prevention. The study was intended to explore the segmentation effects of convolutional neural network (CNN) model on Magnetic Resonance (MR) imaging for Alzheimer's diagnosis and nursing. Specifically, 18 Alzheimer's patients admitted to Indira Gandhi Medical College (IGMC) hospital were selected as the experimental group, with 18 healthy volunteers in the Ctrl group. Furthermore, the CNN model was applied to segment the MR imaging of Alzheimer's patients, and its segmentation effects were compared with those of the fully convolutional neural network (FCNN) and support vector machine (SVM) algorithms. It was found that the CNN model demonstrated higher segmentation precision, and the experimental group showed a higher clinical dementia rating (CDR) score and a lower mini-mental state examination (MMSE) score ($P < 0.05$). The size of parahippocompalgyrus and putamen was bigger in the Ctrl ($P < 0.05$). In experimental group, the amplitude of low-frequency fluctuation (ALFF) was positively correlated with the MMSE score in areas of bilateral cingulum gyri ($r = 0.65$) and precuneus ($r = 0.59$). In conclusion, the grey matter structure is damaged in Alzheimer's patients, and hippocampus ALFF and regional homogeneity (ReHo) is involved in the neuronal compensation mechanism of hippocampal damage, and the caregivers should take an active nursing method.

Keywords: Alzheimer's disease; Clinical dementia rating; Convolutional disease; Fully convolutional neural network; Hippocampal damage; Magnetic resonance; Nursing.

Related information

MedGen

LinkOut - more resources

Full Text Sources

Springer

Medical

Genetic Alliance

MedlinePlus Health Information

ScienceDirect

Knowledge-Based Systems
Volume 211, 9 January 2021, 106560

BEPO: A novel binary emperor penguin optimizer for automatic feature selection

Gaurav Dhiman [a], Diego Oliva [b c], Amandeep Kaur [d], Krishna Kant Singh [e], S. Vimal [f], Ashutosh Sharma [g], Korhan Cengiz [h]

Show more

https://doi.org/10.1016/j.knosys.2020.106560
Get rights and content

Abstract

Emperor Penguin Optimizer (EPO) is a metaheuristic algorithm which is recently developed and illustrates the emperor penguin's huddling behaviour. However, the original version of the EPO will fix issues that are continuing in fact but not discrete. The eight separate EPO variants have been provided in this article. Four transfer features, s-shaped and v-shaped, that are used in order to map the search space into a separate research space are considered in the proposed algorithm. The output of the proposed algorithm is validated using 25 standard benchmark functions. It also analyses the statistical sense of the proposed algorithm. Experimental findings and comparisons suggest that the proposed algorithm performs better than other algorithms. The solution also applies to the issue of feature selection. The findings reveal the supremacy of the binary emperor penguin optimization algorithm.

Introduction

Huge datasets are used for precise classification due to developments in technology, science and engineering fields such as medicine, astronomy, agriculture, etc. These datasets, however, contain insignificant, redundant, and noisy characteristics. Such characteristics can worsen the efficiency of the classifier. The selection of suitable features is crucial to solving this issue. Therefore, in most research areas, the choice of features plays an important role [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11].

The feature selection (FS) is a primary step in selecting the required features from existing ones and further improving the classifier's efficiency. It eliminates obsolete, redundant characteristics and decreases the complexity of time [12], [13], [14], [15], [16], [17]. These are narrowly divided into two classifications, namely, filter and wrapper. Using data

85

COVID-19: Role of Robotics, Artificial Intelligence and Machine Learning During the Pandemic

Authors: Sodhi, Gurpreet K.; Kaur, Simarpreet; Gaba, Gurjot Singh; Kansal, Lavish; Sharma, Ashutosh; Dhiman, Gaurav
Source: Current Medical Imaging, Volume 18, Number 2, 2022, pp. 124-134(11)
Publisher: Bentham Science Publishers
DOI: https://doi.org/10.2174/1573405617666210224115722

Abstract | References | Citations | Supplementary Data

The outbreak of COVID-19 has led to a global health emergency. Emerging from China, it has now been declared as a pandemic. Owing to the fast pace at which it spreads, its control and prevention have now become the greatest challenge. The inner structural analysis of the virus is an important area of research for the invention of the potential drug. The countries are following different strategies and policies to fight against COVID-19; various schemes have also been employed to cope up with the economic crisis. While the government is struggling to balance between the public health sector and the economic collapse, the researchers and medicine practitioners are inclined towards obtaining treatment and early detection of the deadly disease. Further, the impact of COVID-19 on Dentistry is alarming and posing severe threats to the professionals as well. Now, the technology is helping the countries fight against the disease. ML and AI based applications are substantially aiding the process of detection and diagnosis of novel coronavirus. Science of Robotics is another approach followed with an aim to improve patient care.

Keywords: Artificial intelligence; coronavirus; coronavirus disease 2019 (COVID-19); pandemic; respiratory syndrome; robotic

Document Type: Review Article

Publication date: 01 February 2022

ScienceDirect

Computers & Electrical Engineering
Volume 93, July 2021, 107208

84

Artificial intelligence based grid connected inverters for power quality improvement in smart grid applications

Soumya Ranjan Das [a], Prakash K. Ray [b], Arun K. Sahoo [a], Krishna Kant Singh [c], Gaurav Dhiman [d], Akansha Singh [e]

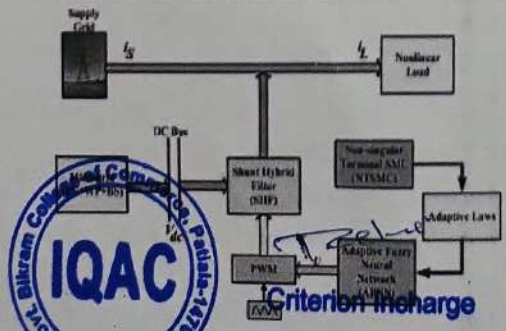
Show more

https://doi.org/10.1016/j.compeleceng.2021.107208
Get rights and content

Abstract

The Smart Grid (SG) is treated as the next level of modern power system which uses the bilateral flow of power and information. The ability of the smart grid for two-way communication amid the utility and consumers makes the grid smart. For proper functioning, all the elements and parameters associated with it should work effectively and efficiently. Power Quality (PQ) is an important issue related to a modern power system. In this paper, more focus is given on PQ improvement in the microgrid (MG) system (which is a part of SG) using shunt hybrid filters (SHF). The performance of SHF is investigated using an improved and advanced controlling technique, i.e., Adaptive Fuzzy-Neural-Network (AFNN) Control for achieving an efficient SG operating under different scenarios of loads and supply voltages. The proposed controller is compared with the other controlling techniques like adaptive fuzzy sliding (AFS) control and adaptive fuzzy back stepping (AFBS). The analysis is performed with the MATLAB/ Simulink tool.

Graphical abstract



Download : Download high-res image (123KB)

Download : Download full-size image

ScienceDirect

83

Computers & Electrical Engineering
Volume 96, Part A, December 2021, 107510

Photo voltaic integrated multilevel inverter based hybrid filter using spotted hyena optimizer

Soumya Ranjan Das [a], Arun Kumar Sahoo [a], Gaurav Dhiman [b], Krishna Kant Singh [c], Akansha Singh [d]

Show more

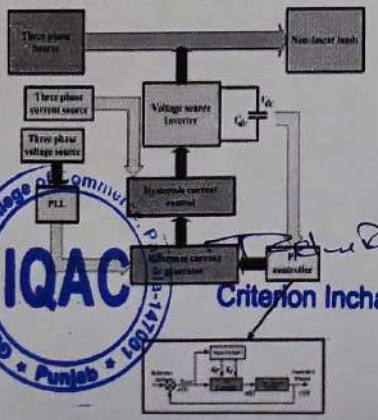
Share Cite

https://doi.org/10.1016/j.compeleceng.2021.107510
Get rights and content

Abstract

In this work, a photovoltaic (PV) integrated modular multilevel inverter (MMI) is connected to a three-phase system for power quality (PQ) improvement. The MMI has modular design and high-quality output waveform. Thus, it is widely used for medium and high-power applications. The Spotted Hyena Optimization (SHO) technique is proposed for generating the reference current and tuning the parameter of the PI controller in MMI. The proposed SHO technique is operated under different loading conditions and is compared with the conventional particle swarm optimization (PSO) and firefly optimization (FO) technique. The controlling part of MMI is designed to supply power produced from the PV system to the grid and controlling the harmonics and reactive power. This paper employs an incremental conductance (INC) based maximum power point tracking (MPPT) technique for drawing maximum power. The performance of the proposed technique is analysed using the MATLAB/Simulink tool.

Graphical abstract



Original research article | Published: 15 February 2021

DON: Deep Learning and Optimization-Based Framework for Detection of Novel Coronavirus Disease Using X-ray Images

Gaurav Dhiman ✉, V. Vinoth Kumar, Amandeep Kaur & Ashutosh Sharma

Interdisciplinary Sciences: Computational Life Sciences
13, 260–272 (2021)

Abstract

In the hospital, a limited number of COVID-19 test kits are available due to the spike in cases every day. For this reason, a rapid alternative diagnostic option should be introduced as an automated detection method to prevent COVID-19 spreading among individuals. This article proposes multi-objective optimization and a deep-learning methodology for the detection of infected coronavirus patients with X-rays. J48 decision tree method classifies the deep characteristics of affected X-ray corona images to detect the contaminated patients effectively. Eleven different convolutional neuronal network-based (CNN) models were developed in this study to detect infected patients with coronavirus pneumonia using X-ray images (AlexNet, VGG16, VGG19, GoogleNet, ResNet18, ResNet500, ResNet101, InceptionV3, Inception ResNetV2, DenseNet201 and XceptionNet). In addition, the parameters of the CNN profound learning model are described using an emperor penguin optimizer with several objectives (MOEPO). A broad review reveals that the proposed model can

Journal of Biomolecular Structure and Dynamics ›
Volume 40, 2022 - Issue 13

81

Research Articles

ADOPT: automatic deep learning and optimization-based approach for detection of novel coronavirus COVID-19 disease using X-ray images

Gaurav Dhiman ✉, Victor Chang, Krishna Kant Singh & Achyut Shankar

Pages 5836-5847 | Received 08 Jul 2020, Accepted 05 Jan 2021, Published online: 21 Jan 2021

Abstract

In the hospital, because of the rise in cases daily, there are a small number of COVID-19 test kits available. For this purpose, a rapid alternative diagnostic choice to prevent COVID-19 spread among individuals must be implemented as an automatic detection method. In this article, the multi-objective optimization and deep learning-based technique for identifying infected patients with coronavirus using X-rays is proposed. J48 decision tree approach classifies the deep feature of corona affected X-ray images for the efficient detection of infected patients. In this study, 11 different convolutional neural network-based (CNN) models (AlexNet, VGG16, VGG19, GoogleNet, ResNet18, ResNet50, ResNet101, InceptionV3, InceptionResNetV2, DenseNet201 and XceptionNet) are developed for detection of infected patients with coronavirus (nCoV) using X-ray images. The efficiency of the proposed model is tested using k-fold cross-validation method. Moreover, the parameters of CNN deep learning model are tuned using multi-objective spotted hyena optimizer (MOSHO). Extensive analysis shows that the proposed model can classify the X-ray images at a good accuracy,

Materials Today: Proceedings xxx (xxxx) xxx

Contents lists available at ScienceDirect

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

Fuzzy Alexandroff soft topological spaces

Pallvi Sharma [a], Nitin Bhardwaj [a], Gaurav Dhiman [b,*]

[a] Department of Mathematics, Lovely Professional University, Jalandhar, Punjab, India
[b] Department of Computer Science, Government Bikram College of Commerce, Punjabi University, Patiala 147001, Punjab, India

ARTICLE INFO

Article history:
Available online xxxx

Keywords:
Fuzzy sets
Fuzzy soft sets
Alexandroff spaces
Connectedness
Compactness

ABSTRACT

The main purpose of this paper is to establish a new type of topological space with the use of Fuzzy soft sets and Alexandroff spaces. We defined Fuzzy Alexandroff Topological Spaces and studied their topological properties. Further, we investigated two major properties of topology namely connectedness and compactness by giving the definitions of c_{f_A}-connectedness, c_{f_i}-connectness and c_{f_A}-compactness. A few examples have additionally been given which can show the utilization of this spaces in the field of Physics. We likewise detailed different outcomes identified with them.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

Topology can be generalized in many ways. Different types of topology has their own importance. Zadeh [6] in 1965 proposed the novel theory of fuzzy sets which has proved to be useful in almost every sphere of sciences. Many mathematicians [21–35] studied this concept for many years and gave important results on them. C.L Chang [7] defined the topology on fuzzy sets in the context of gradeness of open sets. After that, R.Lowen [8] redefined fuzzy topological spaces and gave different important results related to it. He also studied the property of compactness in fuzzy topological spaces. Similarly, Molodstov [4] gave the peculiar concept of soft sets which can eradicate the problems caused by the use of classical methods in solving various engineering problems. Maji [3] elucidated the theory of fuzzy soft sets and used this in solving decision-making problems. In 2012, Sanjay [20] constructed topology on fuzzy soft sets and studied various topological properties like fuzzy soft base, fuzzy soft subbase etc in fuzzy soft topological spaces. Connectedness and compactness are two important properties of topology which have been studied for so many years. Ajmal [9] gave the concept of c_i-connectedness in fuzzy topology which is the strongest form of connectedness among c_M-connectedness [11], c_5 -connectedness [10], O_q-connectedness [13] etc. Ruth and Selvam [14] gave a new approach of connectedness in fuzzy soft topology. In the same way, many authors explored the concept of compactness in fuzzy topology as well as fuzzy soft topology [8,15–17]. Alexandroff spaces [2] possesses a great property known as arbitrary intersection of open sets is open which differentiates it from other kind of topologies.It has been named after Russian Topologist Pavel Alexandroff in 1937. After that, F.G Arenas studied these spaces and found that it has the properties of finite spaces which can be used in the field of digital topology [2]. Timothy [18] gave a note on Alexandroff spaces and studied various properties of it.

Now, in this paper, our main purpose was to introduce a new kind of topology using the concept of fuzzy soft sets and Alexandroff spaces. This kind of topology is known as Fuzzy Alexandroff Soft Topological Spaces. We have also studied various topological properties of it and gave the notion of fuzzy alexandroff soft base and fuzzy alexandroff soft subbase. We further explored the concept of connectedness and compactness and gave the definition of c_{f_A}- connectedness, c_{f_i}-connectedness and c_{f_A}-compactness in Fuzzy Alexandroff Soft Topological Spaces along with their results and examples. This paper is divided into five sections. First two sections contains the introduction and preliminaries which are required for our main work. Third section explained the main work of paper along with the important results. Fourth and fifth section is the elaboration of notion of connectedness and compactness in this newly developed topological space. Throughout the paper, $\left(X, \tau_f, \mu_{f_\varepsilon}\right)$ denotes the Fuzzy Alexandroff Soft Topological Spaces and ε is the arbitrary set of parameters.

* Corresponding author.
E-mail addresses: nitin.15903@lpu.co.in (N. Bhardwaj), gdhiman0001@gmail.com (G. Dhiman).

https://doi.org/10.1016/j.matpr.2021.01.348
2214-7853/
Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

Please cite this article as: P. Sharma, N. Bhardwaj and G. Dhiman, Fuzzy Alexandroff soft topological spaces, Materials Today: Proceedings, https://doi.org/10.1016/j.matpr.2021.01.348

79

Online learning in COVID-19 pandemic: an empirical study of Indian and Turkish higher education institutions

Prathamesh Churi, Kamal Mistry, Muhammad Mujtaba Asad, Gaurav Dhiman, Mukesh Soni, Utku Kose

World Journal of Engineering
ISSN: 1708-5284 (International Standard Serial Number.)
Article publication date: 26 July 2021
Issue publication date: 22 February 2022

Abstract

Purpose

Online learning is essential in today's world. The COVID-19 has resulted in shutting down all the universities across the globe. Countries like India and Turkey (lower-income countries) are suffering a lot in giving the best classroom practice to their students through online mode. The entire way of teaching-learning has changed drastically, and it is a need of an hour. Research suggests that online learning has been shown to increase retention of information, and take less time, meaning the changes coronavirus have caused might be here to stay. It is therefore important to understand from student's perspectives about learning online. The paper systematically surveys the perception of learning online for Indian and Turkan students.

Design/methodology/approach

To achieve this goal, 594 samples of students (from India and Turkey country) have been taken into considerations, and through statistical measures, the results were analyzed. The set of four research questions comprising of effect of study on COVID-19 pandemic, perception of learning online in COVID-19 pandemic, perception of different genders in learning online and perception of Indians over Turkan students in learning online were analyzed through statistical measures such as mean, standard deviation and so on.

Findings

Govt. Bikram College of Commerce, Patiala IQAC Punjab

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala.

Materials Today: Proceedings xxx (xxxx) xxx

Contents lists available at ScienceDirect

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

78

Alexandroff soft topological spaces

Pallvi Sharma [a], Nitin Bhardwaj [a], Gaurav Dhiman [b,*]

[a] Department of Mathematics, Lovely Professional University, Jalandhar, Punjab, India
[b] Department of Computer Science, Government Bikram College of Commerce, Punjabi University, Patiala-147001, Punjab, India

ARTICLE INFO

Article history:
Available online xxxx

Keywords:
Alexandroff spaces
Soft topology
Soft closed sets and Soft mappings

ABSTRACT

In this paper, we characterized another kind of topological space known as Alexandroff Soft Topological space. It is characterized over a general set $\mathcal{X}$ alongside an arbitrary set of parameters. This space satisfies a more grounded condition that an arbitrary intersection of open sets are open. We have likewise contemplated different ideas like basis of a topology, sub base, subspace, closure of a space and so on. Further, different separation axioms known as Alexo T_i-spaces have been presented alongside their properties. This space is also the parametrized type of general topology.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction & preliminaries

Nowadays, researchers are trying to develop novel approaches for solving the fuzzy complex problems [18–30]. There are disparate types of topological spaces namely discrete topology, indiscrete topology, bitopology [7], soft topology [12], fuzzy topology [15], intuitionistic fuzzy topology [3], Alexandroff spaces [2], and nano topology [14] etc. Each one of them is unique in relation to each other in some specific circumstances.

Molodtsov [9] gave a new peculiar theory named as soft set theory in 1999. He implemented this theory effectively in numerous ways such as functions smoothness, theory of games etc. Shabir and Naz [12] proposed notion of soft topology as a parametrized family of topological spaces by giving various definitions. They also defined a topology corresponding to each parameter in a space and explained results related to them. They have also introduced various separation axioms. After that H. Hazra [6] had introduced notions of topological structures in soft set settings. D.N Georgiou [4] studied soft topological space and gave different properties and results related to it. Maji [8] solved various decision making problems. Aktaş and Cagman [5] explained the algebraic nature of soft set theory.

Alexandroff spaces were first introduced by P. Alexandrov, after his name in 1937, with the name of diskrete Raume (1937) [11], where he produced the characterization in context of sets and neighbourhood. These spaces had not been studied properly and systematically. So, F.G Arenas in 1999 took initiative to study these spaces and studied all the properties of topology in it as they played an interesting role in place of finite spaces in digital topology and also it follows from the fact that these spaces have all the properties of finite spaces which are relevant to such theory. These spaces have a great property which differentiates it from general topology like every intersection of an open set is open.

In this paper, we have started with some results of general topology and soft set theory as pre requisites and then obtain a generalisation of them in Alexandrov soft topology presenting new interpretations, classifications, and many concepts related to it. This paper is divided into four sections. First section is the introductory part containing preliminaries as well. Second part defines Alexandroff Soft topological space. This part describes various properties like basis, subbase, subspace, closure of the space etc with various results. Third section explaine separation axioms and their related results along with the examples. Few notations which have been used in the paper are as below-.

$(\mathcal{X}, \tau_{\mathcal{A}})$ denotes an Alexandroff Soft Topological Space, $\mathcal{A}$ denotes the arbitrary set of parameters and Alexo T_i denotes various separation axioms.

The basic definitions and results which are required for further work:

Definition 1.1. [1] "A set X along with a system $\mathcal{F}$ of subsets is said to be an Alexandroff space (or σ- space), if the following points fulfilled:

* Corresponding author.
E-mail addresses: pallavi.sharma0303@gmail.com (P. Sharma), nitin.15903@lpu.co.in (N. Bhardwaj), gdhiman0001@gmail.com (G. Dhiman).

https://doi.org/10.1016/j.matpr.2021.01.351
2214-7853/
Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

Please cite this article as: P. Sharma, N. Bhardwaj and G. Dhiman, Alexandroff soft topological spaces, Materials Today: Proceedings, https://doi.org/10.1016/j.matpr.2021.01.351

Computers, Materials & Continua
DOI:10.32604/cmc.2021.015466
Article

Tech Science Press

77

Real-Time Multimodal Biometric Authentication of Human Using Face Feature Analysis

Rohit Srivastava[1], Ravi Tomar[1], Ashutosh Sharma[2], Gaurav Dhiman[3], Naveen Chilamkurti[4] and Byung-Gyu Kim[5,*]

[1]University of Petroleum and Energy Studies, Dehradun, India
[2]Lovely Professional University, India
[3]Government Bikram College of Commerce, Patiala, 147001, Punjab, India
[4]La Trobe University, Melbourne, Australia
[5]Sookmyung Women's University, Seoul, 04310, Korea
*Corresponding Author: Byung-Gyu Kim. Email: bg.kim@sookmyung.ac.kr
Received: 23 November 2020; Accepted: 08 January 2021

Abstract: As multimedia data sharing increases, data security in mobile devices and its mechanism can be seen as critical. Biometrics combines the physiological and behavioral qualities of an individual to validate their character in real-time. Humans incorporate physiological attributes like a fingerprint, face, iris, palm print, finger knuckle print, Deoxyribonucleic Acid (DNA), and behavioral qualities like walk, voice, mark, or keystroke. The main goal of this paper is to design a robust framework for automatic face recognition. Scale Invariant Feature Transform (SIFT) and Speeded-up Robust Features (SURF) are employed for face recognition. Also, we propose a modified Gabor Wavelet Transform for SIFT/SURF (GWT-SIFT/GWT-SURF) to increase the recognition accuracy of human faces. The proposed scheme is composed of three steps. First, the entropy of the image is removed using Discrete Wavelet Transform (DWT). Second, the computational complexity of the SIFT/SURF is reduced. Third, the accuracy is increased for authentication by the proposed GWT-SIFT/GWT-SURF algorithm. A comparative analysis of the proposed scheme is done on real-time Olivetti Research Laboratory (ORL) and Poznan University of Technology (PUT) databases. When compared to the traditional SIFT/SURF methods, we verify that the GWT-SIFT achieves the better accuracy of 99.32% and the better approach is the GWT-SURF as the run time of the GWT-SURF for 100 images is 3.4 seconds when compared to the GWT-SIFT which has a run time of 4.9 seconds for 100 images.

Keywords: Biometrics; real-time multimodal biometrics; real-time face recognition; feature analysis

1 Introduction and Motivation

Mobile communication is being developed with an exponential growth of mobile users, how to protect mobile networks against various attacks has become a big challenge. As multimedia data

Enhanced emperor penguin optimization algorithm for dynamic economic dispatch with renewable energy sources and microgrid

Article type: Research Article

Authors: Sahoo, Arun Kumar (https://content.iospress.com:443/search?q=author%3A%28%22Sahoo, Arun Kumar%22%29)[a] | Panigrahi, Tapas Kumar (https://content.iospress.com:443/search?q=author%3A%28%22Panigrahi, Tapas Kumar%22%29)[b] | Dhiman, Gaurav (https://content.iospress.com:443/search?q=author%3A%28%22Dhiman, Gaurav%22%29)[c] | Singh, Krishna Kant (https://content.iospress.com:443/search?q=author%3A%28%22Singh, Krishna Kant%22%29)[d] | Singh, Akansha (https://content.iospress.com:443/search?q=author%3A%28%22Singh, Akansha%22%29)[e,*]

Affiliations: [a] Department of Electrical Engineering, IIIT Bhubaneswar, Odisha, India | [b] Department of Electrical Engineering, PMEC Berhampur, India | [c] Department of CSE., Govt. Bikram College of Commerce, Punjab, India | [d] Department of ECE, KIET Group of Institutions, Delhi-NCR, Ghaziabad, India | [e] Department of CSE, ASET, Amity University Uttar Pradesh, Noida

Correspondence: [*] Corresponding author. Akansha Singh, Department of CSE, ASET, Amity University Uttar Pradesh, Noida, India. E-mail: akanshasing@gmail.com (mailto:akanshasing@gmail.com).

Abstract: In this paper, an enhanced version of the emperor penguin optimization algorithm is proposed for solving dynamic economic dispatch (DED) problem incorporating renewable energy sources and microgrid. Dynamic economic load dispatch optimally shares the power on an hourly basis for a day among the committed generating units to satisfy the feasible load demand. Emission of pollutants from the combustion fossil fuel and gradual depletion of fossil fuel encourages the usage of renewable energy sources. Implementation of renewable energy sources with the reinforcement of green energy transforms the fossil fuel-based plant into a hybrid generating plant. The increase in power production with the increase in electricity demand implicates challenges for economical operation. The proposed algorithm is applied to the DED problem for fossil fuel based and renewable energy system to find economic schedule of generated power among the committed generating units. The proposed optimization algorithm is inspired by the huddling behavior of the emperor penguin. The exploration strategy is enhanced by adapting oppositional based learning. Chaotic mapping is used to maintain a proper balance between exploration and exploitation in the entire search space, which minimizes the cost of generation in the power system.

Keywords: Dynamic economic dispatch (DED), emperor penguin optimization (EPO), chaotic oppositional learning-based emperor penguin optimization (COLEPO), constraints, wind energy, micro grid

DOI: 10.3233/JIFS-201483

Journal: Journal of Intelligent & Fuzzy Systems (https://content.iospress.com:443/journals/journal-of-intelligent-and-fuzzy-systems), vol. 40, no. 5, pp. 9041-9058, 2021

Published: 22 April 2021

Price: EUR 27.50

75

COVID-19: Challenges and its Technological Solutions using IoT

Authors: Ajaz, Farhana; Naseem, Mohd; Sharma, Sparsh; Shabaz, Mohammad; Dhiman, Gaurav
Source: Current Medical Imaging, Volume 18, Number 2, 2022, pp. 113-123(11)
Publisher: Bentham Science Publishers
DOI: https://doi.org/10.2174/1573405617666210215143503

35

Abstract | References | Citations | Supplementary Data

COVID-19 is a global pandemic that has affected many countries in a short span of time. People worldwide are susceptible to this deadly disease. To control the prevailing havoc of coronavirus, researchers are adopting techniques like plasma therapy, proning, medicines, etc. To stop the rapid spread of COVID-19, contact tracing is one of the important ways to check the infected people. This paper explains the various challenges people and health practitioners are facing due to COVID-19. In this paper, various ways with which the impact of COVID-19 can be controlled using IoT technology have been discussed. A six-layer architecture of IoT solutions for containing the deadly COVID-19 has been proposed. In addition to this, the role of machine learning techniques for diagnosing COVID-19 has been discussed in this paper, and a quick explanation of the unmanned aerial vehicle (UAVs) applications for contact tracing has also been specified. From the study conducted, it is evident that IoT solutions can be used in various ways for restricting the impact of COVID-19. Furthermore, IoT can be used in the healthcare sector to assure people's safety and good health with minimal costs.

Keywords: Architecture; COVID-19; COVID-19 solutions; IoT; UAV; contact tracing; technological challenges of COVID-19

Document Type: Review Article

Publication date: 01 February 2022

Govt. Bikram College of Commerce, Patiala-147001 IQAC Punjab

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala

Binary Spring Search Algorithm for Solving Various Optimization Problems

74

by Mohammad Dehghani [1], Zeinab Montazeri[1], Ali Dehghani[2], Om P. Malik [3], Ruben Morales-Menendez [4], Gaurav Dhiman [5], Nima Nouri [6], Ali Ehsanifar [7], Josep M. Guerrero [8] and Ricardo A. Ramirez-Mendoza [4,*]

[1] Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz 71557-13876, Iran
[2] Department of Civil Engineering Islamic, Azad Universities of Estahban, Estahban Fars 74518-64747, Iran
[3] Department of Electrical and Computer Engineering, University of Calgary, Calgary, AB T2N 1N4, Canada
[4] School of Engineering and Sciences, Tecnologico de Monterrey, Monterrey, NL 64849, Mexico
[5] Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab 147004, India
[6] Department of Electrical Engineering, Yazd University, Yazd 89195-741, Iran

73

Original Article | Open Access | Published: 27 April 2021

A novel approach to optimize the production cost of railway coaches of India using situational-based composite triangular and trapezoidal fuzzy LPP models

Rakesh Kumar, Gaurav Dhiman, Neeraj Kumar, Rajesh Kumar Chandrawat, Varun Joshi & Amandeep Kaur

Complex & Intelligent Systems **7**, 2053–2068 (2021)

Abstract

This article offers a comparative study of maximizing and modelling production costs by means of composite triangular fuzzy and trapezoidal FLPP. It also outlines five different scenarios of instability and has developed realistic models to minimize production costs. Herein, the first attempt is made to examine the credibility of optimized cost via two different composite FLP models, and the results were compared with its extension, i.e., the trapezoidal FLP model. To validate the models with real-time phenomena, the Production cost data of Rail Coach Factory (RCF) Kapurthala has been taken. The lower, static, and upper bounds have been computed for each situation, and then systems of optimized FLP are constructed. The credibility of each model of composite-triangular and trapezoidal FLP concerning all situations has been obtained, and using this membership grade, the minimum and the greatest minimum costs have been illustrated. The performance of each composite-triangular FLP model was compared to trapezoidal FLP models, and the

ScienceDirect

Materials Today: Proceedings

Available online 4 March 2021

Withdrawn Article in Press What's this?

71

Withdrawal Notice

WITHDRAWN: A survey on applications and security issues of blockchain technology in business sectors

S. Gomathi [a], Mukesh Soni [b], Gaurav Dhiman [c], Ramya Govindaraj [d], Pankaj Kumar [e]

Show more

https://doi.org/10.1016/j.matpr.2021.02.088

This article has been withdrawn: please see Elsevier Policy on Article Withdrawal (https://www.elsevier.com/about/our-business/policies/article-withdrawal).

This article has been withdrawn as part of the withdrawal of the Proceedings of the International Conference on Emerging Trends in Materials Science, Technology and Engineering (ICMSTE2K21). Subsequent to acceptance of these Proceedings papers by the responsible Guest Editors, Dr S. Sakthivel, Dr S. Karthikeyan and Dr I. A. Palani, several serious concerns arose regarding the integrity and veracity of the conference organisation and peer-review process. After a thorough investigation, the peer-review process was confirmed to fall beneath the high standards expected by Materials Today: Proceedings.

The veracity of the conference also remains subject to serious doubt and therefore the entire Proceedings has been withdrawn in order to correct the scholarly record.

70

Original Article | Published: 26 February 2021

Diagnosis and combating COVID-19 using wearable Oura smart ring with deep learning methods

M. Poongodi, Mounir Hamdi, Mohit Malviya, Ashutosh Sharma, Gaurav Dhiman & S. Vimal

Personal and Ubiquitous Computing **26**, 25–35 (2022)

Abstract

Since the coronavirus (COVID-19) outbreak keeps on spreading all through the world, scientists have been crafting varied technologies mainly focusing on AI for an approach to acknowledge the difficulties of the epidemic. In this current worldwide emergency, the clinical business is searching for new advancements to screen and combat COVID-19 contamination. Strategies used by artificial intelligence can stretch screen the spread of the infection, distinguish highly infected patients, and be compelling in supervising the illness continuously. The artificial intelligence anticipation can further be used for passing dangers by sufficiently dissecting information from past sufferers. International patient support with recommendations for population testing, medical care, notification, and infection control can help fight this deadly virus. We proposed the hybrid deep learning method to diagnose COVID-19. The layered

Computers, Materials & Continua
DOI:10.32604/cmc.2021.016002
Article

Tech Science Press

69

Addressing Economic Dispatch Problem with Multiple Fuels Using Oscillatory Particle Swarm Optimization

Jagannath Paramguru[1], Subrat Kumar Barik[1], Ajit Kumar Barisal[2], Gaurav Dhiman[3], Rutvij H. Jhaveri[4], Mohammed Alkahtani[5,6] and Mustufa Haider Abidi[5,*]

[1]KIIT University, Bhubaneswar, Odisha, India
[2]Department of Electrical Engineering, CET, Bhubaneswar, Odisha, India
[3]Department of Computer Science, Government Bikram College of Commerce, Patiala, India
[4]Department of Computer Science & Engineering, Pandit Deendayal Petroleum University, Gandhinagar, India
[5]Raytheon Chair for Systems Engineering, Advanced Manufacturing Institute, King Saud University, Riyadh, 11421, Saudi Arabia
[6]Industrial Engineering Department, College of Engineering, King Saud University, Riyadh, 11421, Saudi Arabia
*Corresponding Author: Mustufa Haider Abidi. Email: mabidi@ksu.edu.sa
Received: 17 December 2020; Accepted: 20 February 2021

Abstract: Economic dispatch has a significant effect on optimal economical operation in the power systems in industrial revolution 4.0 in terms of considerable savings in revenue. Various non-linearity are added to make the fossil fuel-based power systems more practical. In order to achieve an accurate economical schedule, valve point loading effect, ramp rate constraints, and prohibited operating zones are being considered for realistic scenarios. In this paper, an improved, and modified version of conventional particle swarm optimization (PSO), called Oscillatory PSO (OPSO), is devised to provide a cheaper schedule with optimum cost. The conventional PSO is improved by deriving a mechanism enabling the particle towards the trajectories of oscillatory motion to acquire the entire search space. A set of differential equations is implemented to expose the condition for trajectory motion in oscillation. Using adaptive inertia weights, this OPSO method provides an optimized cost of generation as compared to the conventional particle swarm optimization and other new meta-heuristic approaches.

Keywords: Economic load dispatch; valve point loading; industry 4.0; prohibited operating zones; ramp rate limit; oscillatory particle swarm optimization

1 Introduction

Management of energy would-be highly effective and efficient by optimizing the generating cost of fossil fuel-based systems. Economic operation of the power system with effective and reliable generation is highly essential for Industry 4.0, as the electricity market is moving towards the deregulated market. The generation cost of thermal power plants mostly relies on fuel cost. Economic load dispatch is a process of economic scheduling of generating power from

68

Ubiquitous Vehicular Ad-Hoc Network Computing Using Deep Neural Network with IoT-Based Bat Agents for Traffic Management

by Srihari Kannan [1], Gaurav Dhiman [2], Yuvaraj Natarajan [3], Ashutosh Sharma [4], Sachi Nandan Mohanty [5], Mukesh Soni [6], Udayakumar Easwaran [7], Hamidreza Ghorbani [8], Alia Asheralieva [9,*] and Mehdi Gheisari [9,*]

1 Department of Computer Science and Engineering, SNS College of Technology, Coimbatore 641035, India
2 Department of Computer Science, Government Bikram College of Commerce, Punjabi University, Patiala 147002, India
3 Research and Development, ICT Academy, Chennai 600096, India
4 Institute of Computer Technology and Information Security, Southern Federal University, 344006 Rostov-on-Don, Russia
5 Department of Computer Engineering, College of Engineering Pune, Pune 411005, India
6 Department of Computer Science and Engineering, Jagran Lakecity University, Bhopal 462044, India
7 Department of ECE, KIT-Kalaignarkarunanidhi Institute of Technology, Coimbatore 641402, India
8 Department Electrical Engineering and Information Technology, Azad University of Tehran, Tehran, Iran
9 Department of Computer Science and Engineering, Southern University of Science and Technology, Shenzhen 518055, China
* Authors to whom correspondence should be addressed.

Electronics **2021**, *10*(7), 785; **https://doi.org/10.3390/electronics10070785**

Received: 3 January 2021 / Revised: 10 February 2021 / Accepted: 17 February 2021 / Published: 26 March 2021

(This article belongs to the Special Issue **Machine Learning for Wireless Networks - Recent Advances and Future Trends**)

67

Published: 25 April 2021

A Novel Ensemble-based Classifier for Detecting the COVID-19 Disease for Infected Patients

Prabh Deep Singh, Rajbir Kaur, Kiran Deep Singh & Gaurav Dhiman

Information Systems Frontiers **23**, 1385–1401 (2021)

Abstract

The recently discovered coronavirus, SARS-CoV-2, which was detected in Wuhan, China, has spread worldwide and is still being studied at the end of 2019. Detection of COVID-19 at an early stage is essential to provide adequate healthcare to affected patients and protect the uninfected community. This paper aims to design and develop a novel ensemble-based classifier to predict COVID-19 cases at a very early stage so that appropriate action can be taken by patients, doctors, health organizations, and the government. In this paper, a synthetic dataset of COVID-19 is generated by a dataset generation algorithm. A novel ensemble-based classifier of machine learning is employed on the COVID-19 dataset to predict the disease. A convex hull-based approach is also applied to the data to improve the proposed novel, ensemble-based classifier's accuracy and speed. The model is designed and developed through the python programming language and compares with the most popular classifier, i.e., Decision Tree, ID3, and Support Vector Machine. The results indicate that the proposed novel classifier provides a more significant precision, kappa static,

66

Computing the sediment and ensuing its erosive activities using HEC-RAS to surmise the flooding in Kulfo River in Southern Ethiopia

Fikru Damte, Bogale G Mariam, Melkamu Teshome Ayana, Tarun Kumar Lohani, Gaurav Dhiman, Mohammad Shabaz

World Journal of Engineering
ISSN: 1708-5284
(International Standard Serial Number.)
Article publication date: 10 May 2021
Issue publication date: 24 November 2021

Abstract

Purpose

The change in sediment transport phenomenon and morphological characteristics of Kulfo River in the southern part of Ethiopia is estimated using one-dimensional hydraulic modelling. The purpose of this study is to predict erosion and sedimentation using hydrological engineering center-river analysis system (HEC-RAS) model.

Design/methodology/approach

Geometrical survey data of 2005 and 2019 were used to assess the impact of flood depth with 100 years of return per period on the morphology of the river. The bed and bank materials at selected sites of the river were sampled to estimate the grain size using manning roughness coefficient. Discharge and suspended sediment concentration were sampled thrice per day for a stretch of three months to develop a rating curve.

Findings

HEC-RAS model indicates that flood depth with 100 years return period had a significant inundated area during 2019 in comparison to 2005 demonstrating a temporary change in the morphology of the river. Acker and White method in HEC-RAS was used extensively to calculate the sediment load and subsequently calibrated. In the upper reach of the study area, there was aggradation and degradation, whereas the only degradation was noted in the middle

65

Architecture and routing protocols for internet of vehicles: a review

Farhana Ajaz, Mohd Naseem, Sparsh Sharma, Gaurav Dhiman, Mohammad Shabaz and S. Vimal

Published Online: June 14, 2022 · pp 159-175 · https://doi.org/10.1504/IJAHUC.2022.123537

Abstract

Modern vehicles should be able to commute a tremendous amount of data and information within their neighbourhood. To incorporate the requirements of modern vehicles, the conventional vehicular ad hoc network (VANETs) are emerging to the internet of vehicles (IoV). IoV keeps all the smart vehicles connected with the help of sensors, GPS, entertainment system, brakes and throttles. These devices send and store their data with the help of cloud. This paper intends to contribute to the review of IoV, its challenges, characteristics and application. A detail discussion on architectures and routing protocols along with its classification is also discussed. This paper ought to guide and motivate researchers working in the area of IoV to develop scalable and efficient routing protocols.

Keywords

internet of vehicles, IoV, internet of things, IoT, routing protocols, architecture, vehicular ad hoc networks, VANETs, mobile ad hoc networks, MANETs, cloud computing, fog computing

Previous Article Next Article

ScienceDirect

Materials Today: Proceedings

Available online 2 April 2021

Withdrawn Article in Press ⓘ What's this?

63

Withdrawal Notice

WITHDRAWN: Mobile agent assisted I-leach clustering protocol for iot application

Sakshi Vasan [a], Nidhi Kalra [a], Rajiv Kumar [a], Gaurav Dhiman [b]

Show more

https://doi.org/10.1016/j.matpr.2021.03.257

This article has been withdrawn: please see Elsevier Policy on Article Withdrawal (https://www.elsevier.com/about/our-business/policies/article-withdrawal).

This article has been withdrawn as part of the withdrawal of the Proceedings of the International Conference on Emerging Trends in Materials Science, Technology and Engineering (ICMSTE2K21). Subsequent to acceptance of these Proceedings papers by the responsible Guest Editors, Dr S. Sakthivel, Dr S. Karthikeyan and Dr I. A. Palani, several serious concerns arose regarding the integrity and veracity of the conference organisation and peer-review process. After a thorough investigation, the peer-review process was confirmed to fall beneath the high standards expected by Materials Today: Proceedings.

The veracity of the conference also remains subject to serious doubt and therefore the entire Proceedings has been withdrawn in order to correct the scholarly record.

62

Article

Hysteretic controlled Inter-leaved buck –Converter based AC-DC Micro-grid system with enhanced response

March 2021 · Materials Today: Proceedings
DOI:10.1016/j.matpr.2021.02.087

Authors:

Senthilkumar Subramanian
Anna University, Chennai

Sankaralingam Chandramohan
Anna University, Chennai

Gaurav Dhiman
Government Bikram College of Commerce Patiala

Hemlata Singh

Abstract

This paper displays an AC/DC micro-grid idea to straightforwardly incorporate DC/AC sustainable sources and prompts DC/AC interfaces separately using Hysteretic-controller. For an individual-AC&DC-network, the-grid dispenses with various DC-AC-DC&AC-DC-AC shifts. The network builds system productivity, disposes of the inserted AC/DC and DC/DC converters in different homes, office, and mechanical offices which can diminish the size and cost of those offices. Distinctive activity methods of the hybrid-grid are talked about. The different control calculations are examined and proposed to outfit the greatest power from different inexhaustible sources, to store energy surplus amid low pinnacle loads, to take out the unbalance issue in AC link, preserving voltage intensity and seamless interchange of power between AC and DC interfaces in various age and load conditions. It displays a AC/DC grid model under construction. The purpose of this research is to improve the time-response and minimize-current-ripple of Inter- Leaved- Buck-Converter-Micro-Grid-System (I.L.B.C-M.G.S). The Hysteretic -Controller is proposed to enhance the dynamic response of I.L.B.C-M.G.S. Some stimulation and test outcomes are introduced. The closed-loop PR and HC-controlled I.L.B.C-M.G.S are simulated for different-reference-voltages and their results are compared. The enhanced-performance in-terms of-response has been obtained with Hysteresis-controlled-I.L.B.C-M.G.S.

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

NoC offers flexible mechanism by supporting different interconnection networks and fault tolerance. Interconnection network communicates through various communication protocols which are useful for enhancing the flexibility of

Hindawi

Mathematical Problems in Engineering

61

Special Issue

Metaheuristics and Machine Learning: Theory and Applications

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 5580630 | https://doi.org/10.1155/2021/5580630

Show citation

Optimization of Ultrasound Information Imaging Algorithm in Cardiovascular Disease Based on Image Enhancement

Yongfu Shao,[1] Jue Wu,[1] Hongping Ou,[1] Min Pei,[1] Li Liu,[1] Ali Akbar Movassagh,[2] Ashutosh Sharma,[3] Gaurav Dhiman,[4] **Mehdi Gheisari**,[5] and Alia Asheralieva[6]

Show more

Academic Editor: Essam Houssein

Published: 25 Mar 2021

Abstract

To improve the interpretability or perception of information in images for human viewers is the main goal of image enhancement. Aiming at the problem that image edges are difficult to determine due to artefacts, plaques, and vascular branches in cardiovascular ultrasound, an edge ultrasound imaging detection algorithm based on spatial-frequency-domain image enhancement is proposed to improve the clarity of ultrasound images. Firstly, this paper uses the space-frequency-domain enhancement algorithm to enhance the image. This algorithm overcomes the problem of low contrast of conventional algorithms. The enhanced data matrix is used as the cost matrix, and then, the heuristic image search method is used to search the image of the cost matrix. The results show that the use of spatial-frequency-domain image ultrasound imaging algorithm can improve the contrast and sharpness of ultrasound images of cardiovascular disease, which can make the middle edge of the image clearer, the detection accuracy rate is increased to 92.76%, and the ultrasound of cardiovascular disease is improved. The edge of the image gets accuracy. The paper confirms that the ultrasound imaging algorithm based on spatial-frequency-domain image enhancement is worthy of application in clinical ultrasound image processing. The performance of the proposed technique is 32.54%, 75.30%, 21.19%, 21.26%, and 11.10% better than the existing technique in terms of edge energy, detail energy, sharpness, contrast, and information entropy, respectively.

1. Introduction

Intravascular ultrasound (IVUS) is a combination of noninvasive ultrasound technology and invasive catheter technology. It is increasingly used in the diagnosis and treatment of coronary artery disease. It uses a miniature ultrasonic transducer mounted on the tip of the cardiac catheter to transmit and receive high-frequency ultrasound signals in the blood vessel and display the cutoff image of the blood vessel in real time, which can clearly show the thickness of the wall structure and the size and shape of the lumen and can identify

ScienceDirect

Knowledge-Based Systems
Volume 222, 21 June 2021, 106926

60

SSC: A hybrid nature-inspired meta-heuristic optimization algorithm for engineering applications

Gaurav Dhiman

Show more

Share Cite

https://doi.org/10.1016/j.knosys.2021.106926
Get rights and content

Abstract

Chimp Optimization Algorithm (*ChoA*) is a recently developed meta-heuristic approach which is inspired by the individual intelligence and sexual motivation of chimps. It is designed for trapping the local optima to alleviate the slow convergence speed. In this paper, a hybrid algorithm is developed which is based on the sine–cosine functions and attacking strategy of Spotted Hyena Optimizer (*SHO*). This hybrid algorithm is termed as Sine–cosine and Spotted Hyena-based Chimp Optimization Algorithm (*SSC*). This algorithm is used to find the best optimal solutions of real-life complex problems. The sine–cosine and attacking strategy of *SHO* algorithm is responsible for better exploration and exploitation. These strategies are applied to update the equations of chimps during the searching process to overcome the drawbacks of the *ChoA* algorithm such as slow convergence and local minima. Experimental results based on *IEEE CEC'17* and six real-life engineering problems such as welded beam design, tension/compression spring design, pressure vessel design, multiple disk clutch brake design, gear train design, and car side crashworthiness, demonstrate the robustness, effectiveness, efficiency, and convergence analysis of the proposed *SSC* algorithm in comparison with other competitor approaches. Note that the source codes are available at http://www.dhimangaurav.com.

Introduction

Optimization has been a burning issue in every area of science over the last few decades. Researchers are designing best optimization algorithms for solving complex engineering, mathematics, medical fields, statistics, computer science, and more problems [1], [2], [3], [4], [5], [6], [7]. The optimization is commonly defined as a method to select the ideal/optimal solutions for a particular problem/function, globally or almost globally. Majority of the real-world problems can be perceived as optimization issues [8], [9], [10], [11], [12], [13], [14]. The market in each region faces a range of complex problems related to real-world

Published: 20 February 2021

59

Line Monitoring and Identification Based on Roadmap Towards Edge Computing

Ying Liu, Qianchao Sun, Ashutosh Sharma, Amit Sharma & Gaurav Dhiman

Wireless Personal Communications **127**, 441–464 (2022)

Abstract

In recent years, with the rapid growth of Internet of Things (IoT) and cloud services having received special attention from the research community across the world. IoT provides a platform of creating a world connected through internet. The implementation of smart devices collects information from our surroundings and works as per our needs. The implementation of IoT is very challenging as it requires the use of different new technologies like the emergence of fog and edge computing. The growth of fog and edge computing introduces many new requirements that needs to be investigated. The line monitoring system requirements for edge computing scenarios are not yet fully accomplished. The prime focus behind this study is to identify the challenges in the field of line monitoring within the application based on edge computing and to present the requirements of line monitoring for adaptive applications depending on edge computing frameworks. In this article we describes the architecture of fog and edge computing and presented their benefits among each other. The objective behind this study is to study the evolution of edge computing and present their benefits. The main contribution of this article is to present the

Hindawi

Mathematical Problems in Engineering

58

Special Issue

Metaheuristics and Machine Learning: Theory and Applications

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 6644652 | https://doi.org/10.1155/2021/6644652

Show citation

Nature-Inspired-Based Approach for Automated Cyberbullying Classification on Multimedia Social Networking

N. Yuvaraj,[1] K. Srihari,[2] Gaurav Dhiman,[3] K. Somasundaram,[4] Ashutosh Sharma,[5] S. Rajeskannan,[4] Mukesh Soni,[6] Gurjot Singh Gaba,[7] Mohammed A. AlZain,[8] and **Mehedi Masud**[9]

Show more

Academic Editor: Erik Cuevas

Published: 23 Feb 2021

Abstract

In the modern era, the cyberbullying (CB) is an intentional and aggressive action of an individual or a group against a victim via electronic media. The consequence of CB is increasing alarmingly, affecting the victim either physically or psychologically. This allows the use of automated detection tools, but research on such automated tools is limited due to poor datasets or elimination of wide features during the CB detection. In this paper, an integrated model is proposed that combines both the feature extraction engine and classification engine from the input raw text datasets from a social media engine. The feature extraction engine extracts the psychological features, user comments, and the context into consideration for CB detection. The classification engine using artificial neural network (ANN) classifies the results, and it is provided with an evaluation system that either rewards or penalizes the classified output. The evaluation is carried out using Deep Reinforcement Learning (DRL) that improves the performance of classification. The simulation is carried out to validate the efficacy of the ANN-DRL model against various metrics that include accuracy, precision, recall, and f-measure. The results of the simulation show that the ANN-DRL has higher classification results than conventional machine learning classifiers.

1. Introduction

Cyberbullying (CB) is considered as a new or electronic form of traditional bullying [1]. CB is defined as a repetitive, intentional, and aggressive reaction committed by a group or an individual against another group or an individual, which is made by the utilization of Information and Communication Technology (ICT) tools such as social media, Internet, mobile phones [2]. The CB incidents are carried out virtually in Internet media rather than in physical form. The CB consists of hatred messages transmitted via social networking, e-mails, etc. through personal or public computers or through personal mobile phones. This has aroused as a serious threat among nations [1]. Various privacy-preserving tools are adopted in the Internet arena to protect the data; however, most mechanisms are challenged by the process of traffic classification

Original Article | Published: 07 January 2021

SChoA: a newly fusion of sine and cosine with chimp optimization algorithm for HLS of datapaths in digital filters and engineering applications

Mandeep Kaur, Ranjit Kaur, Narinder Singh & Gaurav Dhiman

Engineering with Computers **38**, 975–1003 (2022)

Abstract

The Chimp optimization algorithm (ChoA) inspired by the individual intelligence and sexual motivation of chimps in their group hunting, which is separate from the another social predators. Generally, it is developed for trapping in local optima on the complex functions and alleviate the slow convergence speed. This algorithm has been widely applied to find the best optima solutions of complex global optimization tasks due to its simplicity and inexpensive computational overhead. Nevertheless, premature convergence is easily trapped in the local optimum solution during search process and is ineffective in balancing exploitation and exploration. In this paper, we have developed a modified novel nature inspired optimizer algorithm based on the sine–cosine functions; it is called as sine–cosine chimp optimization algorithm (SChoA). During this research, the sine–cosine functions have been applied to update the equations of chimps during the search process for reducing the several drawbacks of the ChoA algorithm such as slow convergence rate, locating local minima rather than global minima, and low balance amid exploitation and exploration.

ScienceDirect

Materials Today: Proceedings

Available online 11 January 2021

Withdrawn Article in Press What's this?

56

Withdrawal Notice

WITHDRAWN: A survey on impact of data analytics techniques in E-commerce

K. Moorthi [a], Gaurav Dhiman [b], P. Arulprakash [c], C. Suresh [d], K. Srihari [e]

Show more

Share Cite

https://doi.org/10.1016/j.matpr.2020.10.867

This article has been withdrawn: please see Elsevier Policy on Article Withdrawal (https://www.elsevier.com/about/our-business/policies/article-withdrawal).

This article has been withdrawn as part of the withdrawal of the Proceedings of the International Conference on Emerging Trends in Materials Science, Technology and Engineering (ICMSTE2K21). Subsequent to acceptance of these Proceedings papers by the responsible Guest Editors, Dr S. Sakthivel, Dr S. Karthikeyan and Dr I. A. Palani, several serious concerns arose regarding the integrity and veracity of the conference organisation and peer-review process. After a thorough investigation, the peer-review process was confirmed to fall beneath the high standards expected by Materials Today: Proceedings.

The veracity of the conference also remains subject to serious doubt and therefore the entire Proceedings has been withdrawn in order to correct the scholarly record.

ScienceDirect

Computers & Electrical Engineering
Volume 92, June 2021, 107186

35

Automatic detection of cyberbullying using multi-feature based artificial intelligence with deep decision tree classification ☆

Natarajan Yuvaraj [a], Victor Chang [b], Balasubramanian Gobinathan [c], Arulprakash Pinagapani [d], Srihari Kannan [e], Gaurav Dhiman [f], Arsath Raja Rajan [g]

Show more

https://doi.org/10.1016/j.compeleceng.2021.107186
Get rights and content

Abstract

Recent studies have shown that cyberbullying is a rising youth epidemic. In this paper, we develop a novel automated classification model that identifies the cyberbullying texts without fitting them into large dimensional space. On the other hand, a classifier .cannot provide a limited convergent solution due to its overfitting problem. Considering such limitations, we developed a text classification engine that initially pre-processes the tweets, eliminates noise and other background information, extracts the selected features and classifies without data overfitting. The study develops a novel Deep Decision Tree classifier that utilizes the hidden layers of Deep Neural Network (DNN) as its tree node to process the input elements. The validation confirms the accuracy of classification using the novel Deep classifier with its improved text classification accuracy.

Introduction

With rapid urbanization and globalization, modern cities face challenges in maintaining development and qualified living for its citizens. The smart cities emerged such challenges with the integration of immersive technologies [1]. The assessment of online content from the social media platform in smart cities can be regarded as a vital asset that remains a critical challenge [2].

Cyberbullying (CB) is an electronic form of bullying [3,4] that creates an intentional and aggression committed by a group of an individual against another group or an individual on social media platforms [7]. CB has hatred messages that are transmitted via social networking, emails, etc. through personal or public computers or through personal mobile phones. This has aroused as a serious threat among nations [1].

54

A Review on Machine-learning Based Code Smell Detection Techniques in Object-oriented Software System(s)

Authors: Kaur, Amandeep; Jain, Sushma; Goel, Shivani; Dhiman, Gaurav
Source: Recent Advances in Electrical & Electronic Engineering (Formerly Recent Patents on Electrical & Electronic Engineering), Volume 14, Number 3, 2021, pp. 290-303(14)
Publisher: Bentham Science Publishers
DOI: https://doi.org/10.2174/2352096513999200922125839

Abstract | References | Citations | Supplementary Data

Background: Code smells are symptoms that something may be wrong in software systems that can cause complications in maintaining software quality. In literature, there exist many code smells and their identification is far from trivial. Thus, several techniques have also been proposed to automate code smell detection in order to improve software quality.

Objective: This paper presents an up-to-date review of simple and hybrid machine learning-based code smell detection techniques and tools.

Methods: We collected all the relevant research published in this field till 2020. We extracted the data from those articles and classified them into two major categories. In addition, we compared the selected studies based on several aspects like code smells, machine learning techniques, datasets, programming languages used by datasets, dataset size, evaluation approach, and statistical testing.

Results: A majority of empirical studies have proposed machine-learning based code smell detection tools. Support vector machine and decision tree algorithms are frequently used by the researchers. Along with this, a major proportion of research is conducted on Open Source Softwares (OSS) such as Xerces, Gantt Project and ArgoUml. Furthermore, researchers pay more attention to Feature Envy and Long Method code smells.

Conclusion: We identified several areas of open research like the need for code smell detection techniques using hybrid approaches, the need for employing valid industrial datasets, etc.

Keywords: Code smells; Open Source Softwares (OSS); anti-patterns; industrial datasets; machine learning; software maintenance

Document Type: Review Article

Publication date: 01 May 2021

More about this publication?

Received: April 16, 2020. Revised: July 3, 2020.

INASS

International Journal of
Intelligent Engineering & Systems

http://www.inass.org/

Darts Game Optimizer: A New Optimization Technique Based on Darts Game

Mohammad Dehghani[1]* Zeinab Montazeri[1] Hadi Givi[2]
Josep M. Guerrero[3] Gaurav Dhiman[4]

[1]*Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, Iran*
[2]*Department of Electrical Engineering, Faculty of Engineering, University of Shahreza, Shahreza 86481-41143, Iran*
[3]*Center for Research on Microgrids (CROM), Department of Energy Technology, Aalborg University, Aalborg, Denmark*
[4]*Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab 147004, India*
* Corresponding author's Email: adanbax@gmail.com

Abstract: In this paper, a novel game-based optimization technique entitled darts game optimizer (DGO) is proposed. The novelty of this investigation is DGO designing based on simulating the rules of Darts game. The key idea in DGO is to get the most possible points by the players in their throws towards the game board. Simplicity of equations and lack of control parameters are the main features of the proposed algorithm. The ability and quality of DGO performance in optimization is evaluated on twenty-three objective functions, and then is compared with eight other optimization algorithms including Genetic Algorithm (GA), Particle Swarm Optimization (PSO), Gravitational Search Algorithm (GSA), Teaching Learning-Based Optimization (TLBO), Grey Wolf Optimizer (GWO), Grasshopper Optimization Algorithm (GOA), Whale Optimization Algorithm (WOA), and Marine Predators Algorithm (MPA). The results of simulation and comparison indicate the superiority and optimal quality of the proposed DGO algorithm over the mentioned algorithms.

Keywords: Optimization, Optimizer, Darts game, Darts game optimizer, Game-based algorithm.

1. Introduction

1.1 Motivation

There are many optimization problems in different disciplines of science and technology that need to be solved using appropriate optimization methods. Hence, employing an effective optimization algorithm is of great importance for solving such problems. In this regard, optimization algorithms have been applied by scientists in various fields such as energy [1], protection [2], electrical engineering [3-6], energy carriers [7,8], and data mining [9] to achieve the optimal solution. This issue motivates researchers to focus on optimization studies, modification of existing methods, and especially introduction of new optimization methods.

1.2 Background

In general, optimization algorithms can be categorized into four groups including physics-based, swarm-based, evolutionary-based, and game-based algorithms.

Physics-based algorithms are designed based on simulation and application of existing laws in physics. For example, the spring search algorithm (SSA) is designed using Hawk's law in the weight and spring system. In SSA, the members of the population are a number of weights that are connected to each other by a spring and the optimal answer is provided by reaching the equilibrium point [10, 11]. Some of the other algorithms in this category are Ray Optimization (RO) algorithm [12], Black Hole (BH) algorithm [13], Artificial Chemical Reaction Optimization Algorithm (ACROA) [14], Charged

 DOI: 10.22266/ijies2020.1031.26

52

Analysis of protein-ligand interactions of SARS-CoV-2 against selective drug using deep neural networks

Publisher: TUP Cite This PDF

Natarajan Yuvaraj ; Kannan Srihari ; Selvaraj Chandragandhi ; Rajan Arshath Raja ; Ga... All Authors

Abstract: In recent time, data analysis using machine learning accelerates optimized solutions on clinical healthcare systems. The machine learning methods greatly offer an effcie... **View more**

▸ **Metadata**

Abstract:

In recent time, data analysis using machine learning accelerates optimized solutions on clinical healthcare systems. The machine learning methods greatly offer an efficient prediction ability in diagnosis system alternative with the clinicians. Most of the systems operate on the extracted features from the patients and most of the predicted cases are accurate. However, in recent time, the prevalence of COVID-19 has emerged the global healthcare industry to find a new drug that suppresses the pandemic outbreak. In this paper, we design a Deep Neural Network (DNN) model that accurately finds the protein-ligand interactions with the drug used. The DNN senses the response of protein-ligand interactions for a specific drug and identifies which drug makes the interaction that combats effectively the virus. With limited genome sequence of Indian patients submitted to the GISAID database, we find that the DNN system is effective in identifying the protein-ligand interactions for a specific drug.

Published in: Big Data Mining and Analytics (Volume: 4 , Issue: 2, June 2021)

Page(s): 76 - 83

INSPEC Accession Number: 20349085

Date of Publication: 01 February 2021

DOI: 10.26599/BDMA.2020.9020007

Electronic ISSN: 2096-0654

Publisher: TUP

51

Coronaviruses

Editor-in-Chief

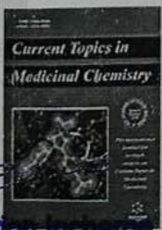
ISSN (Print): 2666-7967
ISSN (Online): 2666-7975

Letter to the Editor

The Effects of Coronavirus (COVID-19) on the Psychological Health of Indian Poultry Farmers

Author(s): Gaurav Dhiman*

Volume 2, Issue 2, 2021
Published on: 17 June, 2020
Page: [131 - 132] Pages: 2
DOI: 10.2174/2666796701999200617160755



Soft Computing
https://doi.org/10.1007/s00500-020-05046-9

METHODOLOGIES AND APPLICATION

MoSSE: a novel hybrid multi-objective meta-heuristic algorithm for engineering design problems

Gaurav Dhiman[1] · Meenakshi Garg[1]

Abstract
This paper introduces a novel hybrid optimization algorithm called *MoSSE* by combining the features of Multi-objective Spotted Hyena Optimizer (*MOSHO*), Salp Swarm Algorithm (*SSA*), and Emperor Penguin Optimizer (EPO). *MoSSE* uses *MOSHO's* searching capabilities to effectively discover the search space, *SSA's* leading and selection process to achieve the fittest global solution with quicker convergence technique, and *EPO's* effective mover technique for better adjustment of the next solution. The algorithm is tested on ten *IEEE CEC-9* standard test functions and compared with seven well-known multi-objective optimization algorithms according to their performance. The experimental results show that *MoSSE* provides highly competitive outcomes in terms of convergence speed, searchability, and accuracy. Statistical testing is also performed on *IEEE CEC-9* test functions. Four performance metrics (i.e., Hypervolume, Δ_p, Spread, and Epsilon) are used to validate the searching capability of the proposed algorithm. *MoSSE* is further applied to welded beam, multi-disk clutch brake, pressure vessel, 25-bar truss design problems to test its effectiveness. The findings show the utility of the proposed algorithm to resolve the real-life complex multi-objective optimization problems.

Keywords Spotted Hyena optimizer · Salp Swarm Algorithm · Emperor Penguin Optimizer · Multi-objective optimization · Engineering design problems

1 Introduction

Meta-heuristic optimization approaches take enormous interest from researchers over the past few decades in explaining the search and optimization problems. Such approaches aim to find the solution in computationally traceable ways and are comparatively cheaper and more rapidly than comprehensive searching (Bandarua and Kalyanmoy 2016; Dhiman and Amandeep 2019). Nowadays, researchers are trying to develop the meta-heuristic-based approaches for solving complex problems (Kaur and Gaurav 2019; Garg and Dhiman 2020; Verma et al. 2018; Singh and Gaurav 2017; Garg and Dhiman 2020; Chandrawat et al. 2017; Dehghani et al. 2020). Meta-heuristic optimization techniques can be broadly categorized into two categories such as *single-objective* and *multi-objective* (Dhiman and Kaur 2020; Dhiman et al. 2020a, b). *Single-objective* approaches seek to provide the unique global solution after optimizing the key objective function (Chiandussi et al. 2012; Satnam Kaur et al. 2020). However, most real optimization problems require *multi-objective* that need to be tackled at the same time. Since these objectives are usually contradictory in nature, finding the optimal solution for all of the objectives is difficult (Dehghani et al. 2019; Dhiman 2019a, b). *Multi-objective* approaches are also known in these situations, where several objectives need to be reached before some rational conclusion can be drawn (Branke et al. 2004). *Multi-objective* optimization methods also known as vector optimization approach and involves several competing objects and aim to find the fittest possible solutions (Chiandussi et al. 2012; Coello Coello et al. 2007). The key challenge in *multi-objective* optimization is to model the preferences of decision-makers in ordering or assessing the relative importance of competing objectives. This problem has three main approaches, specifically *priori*, *posteriori*, and *interactive* (Marler and Arora 2004). *Priori* approaches employ the scalar function

Communicated by V. Loia.

✉ Gaurav Dhiman
gdhiman0001@gmail.com

Meenakshi Garg
meenagarg82@gmail.com

[1] Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab 147001, India

Published online: 13 June 2020

Methodologies and Application | Published: 13 June 2020

MoSSE: a novel hybrid multi-objective meta-heuristic algorithm for engineering design problems

Gaurav Dhiman & Meenakshi Garg

Soft Computing **24**, 18379–18398 (2020)

Abstract

This paper introduces a novel hybrid optimization algorithm called *MoSSE* by combining the features of Multi-objective Spotted Hyena Optimizer (*MOSHO*), Salp Swarm Algorithm (*SSA*), and Emperor Penguin Optimizer (EPO). *MoSSE* uses *MOSHO's* searching capabilities to effectively discover the search space, *SSA's* leading and selection process to achieve the fittest global solution with quicker convergence technique, and *EPO's* effective mover technique for better adjustment of the next solution. The algorithm is tested on ten *IEEE CEC-9* standard test functions and compared with seven well-known multi-objective optimization algorithms according to their performance. The experimental results show that *MoSSE* provides highly competitive outcomes in terms of convergence speed, searchability, and accuracy. Statistical testing is also performed on *IEEE CEC-9* test functions. Four performance metrics (i.e., Hypervolume, Δ_p, Spread, and Epsilon) are used to validate the searching capability of the proposed algorithm. *MoSSE* is further applied to welded beam, multi-disk clutch brake, pressure vessel, 25 bar truss design problems to test its effectiveness. The findings show the utility of the proposed algorithm to resolve the real-life complex multi-objective optimization problems.

Home → International Journal of Vehicle Design → Vol. 80, No. 2-4

49

NO ACCESS

HKn-RVEA: a novel many-objective evolutionary algorithm for car side impact bar crashworthiness problem

Gaurav Dhiman and Amandeep Kaur

Published Online: September 23, 2020 · pp 257-284 · https://doi.org/10.1504/IJVD.2019.109869

Abstract

In this paper, a novel hybrid many-objective evolutionary algorithm, named as hypervolume indicator based on knee point driven and reference vector guided evolutionary algorithm (HKn-RVEA) is proposed. HKn-RVEA is based on the hypervolume indicator, knee points, and reference vector adaptation strategies. The knee points are used to improve the search ability. The reference vectors are used to decompose the optimisation problem into a number of sub-problems. In the proposed algorithm, an adaptation strategy is used to adjust the distribution of the knee points and reference vectors. The proposed algorithm is compared with five well-known evolutionary algorithms over standard benchmark test functions. The results show the performance of HKn-RVEA is better than the competitor algorithms in terms of inverted generational distance (IGD) and hypervolume (HV) performance measures. HKn-RVEA is also applied to real-life car side crashworthiness problem to demonstrate its efficiency. The experimental results show that the proposed algorithm is able to solve many-objective real-life problems.

Keywords

many-objective optimisation, HypE, hypervolume estimation algorithm, reference vector guided evolutionary algorithm, RVEA, knee points, convergence, diversity

Previous Article Next Article

Original Article | Published: 06 June 2020

A novel content-based image retrieval approach for classification using GLCM features and texture fused LBP variants

Meenakshi Garg & Gaurav Dhiman

Neural Computing and Applications **33**, 1311–1328 (2021)

Abstract

This paper presents a content-based image retrieval technique that focuses on extraction and reduction in multiple features. To obtain multi-level decomposition of the image by extracting approximation and correct coefficients, discrete wavelet transformation is applied to the *RGB* channels initially. Therefore, both approximation and correct coefficients are applied to the dominant rotated local binary pattern termed as texture descriptor which is computationally effective and rotationally invariant. For a local neighbor patch, a rotation invariance function image is obtained by measuring the descriptor relative to the reference. The proposed approach contains the complete structural information extracted from the local binary patterns and also extracts the additional information using the information of magnitude, thereby achieving extra discriminative power. Then, *GLCM* description is used by obtaining the dominant rotated local binary pattern image to extract the statistical characteristics for texture image classification. The proposed technique is applied to *CORAL* dataset with the help of particle swarm optimization-based feature selector to minimize the number of features that can be used during the classification process. The three classifiers, i.e.,

Original Research | Published: 06 October 2020

A novel algorithm for global optimization: Rat Swarm Optimizer

47 - (P)

Gaurav Dhiman, Meenakshi Garg, Atulya Nagar, Vijay Kumar & Mohammad Dehghani

Journal of Ambient Intelligence and Humanized Computing
12, 8457–8482 (2021)

Abstract

This paper presents a novel bio-inspired optimization algorithm called Rat Swarm Optimizer (RSO) for solving the challenging optimization problems. The main inspiration of this optimizer is the chasing and attacking behaviors of rats in nature. This paper mathematically models these behaviors and benchmarks on a set of 38 test problems to ensure its applicability on different regions of search space. The RSO algorithm is compared with eight well-known optimization algorithms to validate its performance. It is then employed on six real-life constrained engineering design problems. The convergence and computational analysis are also investigated to test exploration, exploitation, and local optima avoidance of proposed algorithm. The experimental results reveal that the proposed RSO algorithm is highly effective in solving real world optimization problems as compared to other well-known optimization algorithms. Note that the source codes of the proposed technique are available at: http://www.dhimangaurav.com.

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

IQAC
Govt. Bikram College of Commerce, Patiala (Punjab)

Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

A New Methodology Called Dice Game Optimizer for Capacitor Placement in Distribution Systems

Electrical Engineering & Electromechanics, 0(1), 61–64, 2020. doi:10.20998/2074-272x.2020.1.10

4 Pages
Posted: 4 Mar 2021

M. Dehghani (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4539860)
Shiraz University of Technology

Z. Montazeri (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4539867)
Shiraz University of Technology

O.P. Malik (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4540510)
University of Calgary

K. Al-Haddad (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4540523)
University of Quebec in Montreal

J.M. Guerrero (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4540525)
Aalborg University

G. Dhiman (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4540527)
Government Bikram College of Commerce

Date Written: February 19, 2020

Abstract

Purpose. Shunt capacitors are installed in power system for compensating reactive power. Therefore, feeder capacity releases, voltage profile improves and power loss reduces. However, determination optimal location and size of capacitors in distribution systems is a complex optimization problem. In order to determine the optimum size and location of the capacitor, an objective function which is generally defined based on capacitor installation costs and power losses should be minimized According to operational limitations. This paper offers a newly developed metaheuristic technique, named dice game optimizer to determine optimal size and location of capacitors in a distribution network. Dice game optimizer is a game based optimization technique that is based on the rules of the dice game.

Keywords: capacitor placement, dice game optimizer, distribution systems, optimization algorithm

16 References

1. M M Aman, G B Jasmon, A H A Bakar, H Mokhlis, M Karimi
   Optimum shunt capacitor placement in distribution system -A review and comparative study
   Renewable and Sustainable Energy Reviews, volume 30, p. 429 - 439
   Posted: 2014
   Crossref (https://doi.org/10.1016/j.rser.2013.10.002)

2. H N Ng, M M A Salama, A Y Chikhani
   Classification of capacitor allocation techniques
   IEEE Transactions on Power Delivery, volume 15, issue 1, p. 387 - 392
   Posted: 2000
   Crossref (https://doi.org/10.1109/61.847278)

3. Da Silva, I C Cardoso, S De Oliveira, E J De Souza Costa, J Pereira, J L R Gallego
   A heuristic constructive algorithm for capacitor placement on distribution systems
   IEEE Transactions on Power Systems, volume 23, issue 4, p. 1619 - 1626
   Posted: 2008
   Crossref (https://doi.org/doi:10.1109/tpwrs.2008.2004742)

4. M.-R Haghifam, O P Malik

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

Govt. Bikram College of Commerce, Patiala * Punjab * IQAC

Original Article | Published: 25 February 2020

A novel hybrid hypervolume indicator and reference vector adaptation strategies based evolutionary algorithm for many-objective optimization

Gaurav Dhiman, Mukesh Soni, Hari Mohan Pandey, Adam Slowik & Harsimran Kaur

Engineering with Computers **37**, 3017–3035 (2021)

Abstract

A novel hybrid many-objective evolutionary algorithm called Reference Vector Guided Evolutionary Algorithm based on hypervolume indicator (H-RVEA) is proposed in this paper. The reference vectors are used in a number of sub-problems to decompose the optimization problem. An adaptation strategy is used in the proposed algorithm to adjust the reference vector distribution. The proposed algorithm is compared over well-known benchmark test functions with five state-of-the-art evolutionary algorithms. The results show H-RVEA's superior performance in terms of the inverted generational distance and hypervolume performance measures than the competitor algorithms. The suggested algorithm's computational complexity is also analysed. The statistical tests are carried out to demonstrate the statistical significance of the proposed algorithm. In order to demonstrate its efficiency, H-RVEA is also applied to solve two real-life constrained many-objective optimization problems. The experimental results indicate that the proposed algorithm can solve the many-objective real-life problems. Note that the source codes of the

ScienceDirect

Engineering Applications of Artificial Intelligence
Volume 90, April 2020, 103541

Tunicate Swarm Algorithm: A new bio-inspired based metaheuristic paradigm for global optimization ☆

Satnam Kaur [a], Lalit K. Awasthi [a], A.L. Sangal [a], Gaurav Dhiman [b]

Show more

https://doi.org/10.1016/j.engappai.2020.103541
Get rights and content

Abstract

This paper introduces a bio-inspired metaheuristic optimization algorithm named Tunicate Swarm Algorithm (TSA). The proposed algorithm imitates jet propulsion and swarm behaviors of tunicates during the navigation and foraging process. The performance of TSA is evaluated on seventy-four benchmark test problems employing sensitivity, convergence and scalability analysis along with ANOVA test. The efficacy of this algorithm is further compared with several well-regarded metaheuristic approaches based on the generated optimal solutions. In addition, we also executed the proposed algorithm on six constrained and one unconstrained engineering design problems to further verify its robustness. The simulation results demonstrate that TSA generates better optimal solutions in comparison to other competitive algorithms and is capable of solving real case studies having unknown search spaces.

Note that the source codes of the proposed TSA algorithm are available at

Introduction

To minimize or maximize a function in terms of decision variables, optimization approach plays a significant role. Many real-life problems have a large number of solution spaces, which consists of non-linear constraints. Such problems also have high computational cost along with non-convex and complicated in nature(Singh and Dhiman, 2018a, Dhiman and Kumar, 2018c, Singh and Dhiman, 2018b, Dhiman and Kaur, 2018, Singh et al., 2018b, Dhiman and Kumar, 2018a, Kaur et al., 2018, Singh et al., 2018a). Hence, for solving such problems in terms of large number of variables are very complicated tasks. Further, local optimum solutions as obtained from various classical approaches do not guarantee for the best solution. To resolve these issues, numerous metaheuristic optimization algorithms are proposed by the researchers(Dhiman et al., 2018, Dhiman and

43/2

Deep Convolution Neural Network Approach for Defect Inspection of Textured Surfaces

Meenakshi Garg[1], Gaurav Dhiman[2,]*

Corresponding Author:
Gaurav Dhiman

Affiliation(s):
1. Department of Computer Science, Government Bikram College of Commerce, Patiala 147004, Punjab, India
Email: meenagarg82@gmail.com
2. Department of Computer Science, Government Bikram College of Commerce, Patiala 147004, Punjab, India
Email: gdhiman0001@gmail.com
*Corresponding Author: Gaurav Dhiman, Email: gdhiman0001@gmail.com

Abstract:
Defect Inspection of Textured Surfaces is a challenging problem which occurs during manufacturing in many processing phases. With arbitrary length, shape and orientation, these defects occur. Moreover, there are fewer and different photos of defective products. Deep Convolution Neural Network (CNN) has an impressive development in target detection, and better results have been obtained with the implementation of deep CNN design for texture detection. Nonetheless, with the growing detection accuracy of deep CNNs, there are the drawbacks of significantly increasing computational costs and processing resources, which seriously hinders CNN's use in resource-limited environments such as mobile or embedded phones. In this paper, a novel framework is proposed that uses raw image database patch statistics joint with two layers of neural network for surface defect detection. For defect detection, a convolution neural network (CNN) classifier is used. Imaging analysis of training samples using Deep Convolution Neural Network (CNN) is used to find the defect in an image's target area. In point of energy saving, the results of the experiment show that proposed method has numerous advantages in terms of reduction in time and cost. It also shows the high-performance contrast to conventional manual inspection process with less repetition and helps to build the object detection classifier with high generalization potential and high detection accuracy.

Keywords:
Deep Convolution neural network (DCNN); Convolution neural network (CNN); Machine Vision; Defect detection; Fabric Defect Classification

Cite This Paper:
Meenakshi Garg, Gaurav Dhiman (2020). Deep Convolution Neural Network Approach for Defect Inspection of Textured Surfaces. Journal of the Institute of Electronics and Computer, 2, 28-38. https://doi.org/10.33969/JIEC.2020.21003.

References:
[1] Tiwari, V., & Sharma, G. (2015). Automatic fabric fault detection using morphological operations on bit plane. IJCSNS International Journal of Computer Science and Network Security, 5(10), 30-35.
[2] Ngan, H. Y., Pang, G. K., & Yung, N. H. (2011). Automated fabric defect detection—a review. Image and vision computing, 29(7), 442-458.
[3] Handbook, T. (2000). Hong Kong Productivity Council. The Hong Kong Cotton Spinners Association.
[4] Anh, N. T. H., & Giao, B. C. (2019, November). An Empirical Study on Fabric Defect Classification Using Deep Network Models. In International Conference on Future Data and Security Engineering (pp. 739-746). Springer, Cham.
[5] Boukouvalas, C., Kittler, J., Marik, R., & Petrou, M. (1999). Color grading of randomly textured ceramic tiles using color histograms. IEEE Transactions on industrial electronics, 46(1), 219-226.
[6] Wiltschi, K., Pinz, A., & Lindeberg, T. (2000). An automatic assessment scheme for steel quality inspection. Machine Vision and Applications, 12(3), 113-128.
[7] Chan, C. H., & Pang, G. K. (2000). Fabric defect detection by Fourier analysis. IEEE transactions on Industry Applications, 36(5), 1267-1276.
[8] Han, Y., & Shi, P. (2007). An adaptive level-selecting wavelet transform for texture defect detection. Image and Vision Computing, 25(8), 1239-1248.
[9] Tsai, D. M., & Hsiao, B. (2001). Automatic surface inspection using wavelet reconstruction. Pattern Recognition, 34(6), 1285-1305.
[10] Yang, X., Pang, G., & Yung, N. (2005). Robust fabric defect detection and classification using multiple adaptive wavelets. IEE Proceedings-Vision, Image and Signal Processing, 152(6), 715-723.
[11] Zhi, Y. X., Pang, G. K., & Yung, N. H C. (2001, May). Fabric defect detection using adaptive wavelet. In 2001 IEEE International Conference on Acoustics, Speech, and Signal Processing. Proceedings (Cat. No. 01CH37221) (Vol. 6, pp. 3697-3700). IEEE.
[12] Jing, J. F., Ma, H., & Zhang, H. H. (2019). Automatic fabric defect detection using a deep convolutional neural network. Coloration Technology, 135(3), 213-223.
[13] Park, J. K., Kwon, B. K., Park, J. H., & Kang, D. J. (2016). Machine learning-based imaging system for surface defect inspection. International Journal of Precision Engineering and Manufacturing-Green Technology, 3(3), 303-310.
[14]Fukushima, K., Miyake, S., & Ito, T. (1983). Neocognitron: A neural network model for a mechanism of visual pattern recognition. IEEE transactions on systems, man, and cybernetics, (5), 826-834.
[15] Le, Y., Bottou, L., Bengio, Y., & Haffner, P. (1998). " Gradient-Based Learning Applied to Document Recognition", Proceedings of the IEEE, vol. 86, no. 11, pp. 2278-2324.
[16] Hinton, G. E., Osindero, S., & Teh, Y. W. (2006). A fast learning algorithm for deep belief nets. Neural computation, 18(7), 1527-1554.
[17] Collobert, R. and Weston, J., "A Unified Architecture for Natural Language Processing: Deep Neural Networks with Multitask Learning," Proc. of the 25th Int. Conf. on Machine Learning, pp. 160-167, 2008.
[18] Hinton, G., Deng, L., Yu, D., Dahl, G., Mohamed, A., Jaitly, N., & Sainath, T. (2012). Deep neural networks for acoustic modeling in speech recognition. IEEE Signal processing magazine, 29.
[19] Sonka, M., Hlavac, V., & Boyle, R. (2014). Image processing, analysis, and machine vision. Cengage Learning.

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

Principal
Govt. Bikram College of Commerce, Patiala.

IEC
Institute of Electronics and Computer

Journal of the Institute of Electronics and Computer, 2020, 2, 28-38
https://iecscience.org/journals/JIEC
ISSN Online: 2643-8240

Deep Convolution Neural Network Approach for Defect Inspection of Textured Surfaces

Meenakshi Garg[1], Gaurav Dhiman[2,*]

[1] Department of Computer Science, Government Bikram College of Commerce, Patiala 147004, Punjab, India
Email: meenagarg82@gmail.com
[2] Department of Computer Science, Government Bikram College of Commerce, Patiala 147004, Punjab, India
Email: gdhiman0001@gmail.com
*Corresponding Author: Gaurav Dhiman, Email: gdhiman0001@gmail.com

How to cite this paper: Meenakshi Garg, Gaurav Dhiman (2020). Neuro-fuzzy assessment of pupil performance based on e-learning platform implementation. *Journal of the Institute of Electronics and Computer*, **2**, 28-38. https://doi.org/10.33969/JIEC.2020.21003

Received: December 23, 2019
Accepted: January 22, 2020
Published: January 27, 2020

Abstract

Defect Inspection of Textured Surfaces is a challenging problem which occurs during manufacturing in many processing phases. With arbitrary length, shape and orientation, these defects occur. Moreover, there are fewer and different photos of defective products. Deep Convolution Neural Network (CNN) has an impressive development in target detection, and better results have been obtained with the implementation of deep CNN design for texture detection. Nonetheless, with the growing detection accuracy of deep CNNs, there are the drawbacks of significantly increasing computational costs and processing resources, which seriously hinders CNN's use in resource-limited environments such as mobile or embedded phones. In this paper, a novel framework is proposed that uses raw image database patch statistics joint with two layers of neural network for surface defect detection. For defect detection, a convolution neural network (CNN) classifier is used. Imaging analysis of training samples using Deep Convolution Neural Network (CNN) is used to find the defect in an image's target area. In point of energy saving, the results of the experiment show that proposed method has numerous advantages in terms of reduction in time and cost. It also shows the high-performance contrast to conventional manual inspection process with less repetition and helps to build the object detection classifier with high generalization potential and high detection accuracy.

Keywords

Deep Convolution neural network (DCNN); Convolution neural network (CNN); Machine Vision; Defect detection; Fabric Defect Classification

EARLY DETECTION OF LIFESTYLE DISEASE

GEETANJALI GOYAL
Department of Computers, Govt. Bikram College of Commerce, Patiala
Email: goyal961@gmail.com

ABSTRACT

Shift work is unavoidable and roughly 15-20% of workers are estimated to work on shift schedules worldwide. On 2007, the International Agency for Research on Cancer (IARC) panel concluded that shift work that involves circadian disruption is probably carcinogenic in humans. The risk has become a growing concern of public health. Shift work could not be exterminated though, there are possible protective measures; such as a nap system during night work to modulate burden of night work, and breast cancer screening program among female shift workers for early detection of the disease. This report reviews current evidence on that risk and points out contentions for the risk communication.

Keywords: Healthcare, lifestyle disease, data mining, disease diagnosis

1. Introduction

Lifestyle diseases have risk factors that are comparable to prolonged exposure to three lifestyle behaviours - smoking, unhealthy diet and physical inactivity - and that lead to the development of chronic diseases such as heart diseases, diabetes, stroke, obesity, metabolic syndrome, and some types of cancer. Medical informatics is altering the present scenario of medical science industry. Every individual has its own way of living that he is patent in copying with their physical, psychosomatic, societal and monetary environments on a regular basis. With new innovations every day in a medical sector accompanied with the advancements, doctors are able to diagnose and cure the problem effectively. A disease diagnostic system in healthcare application must be trained through existing healthcare data. The data for training diagnostic system can be generated through different modes like screening, physical and clinical diagnosis. Lifestyle reflects a person's attitude, behaviour, eating habits, social, economic and moral values. It is a reflection of the person that they perceive and want to be perceived about themselves by society. The lifestyle of a person is very much affected by the genes, culture, society and the region in which he lives and grows. In general, there are two major pillars of lifestyle which are as follows Eating habits (intake of dietary, sugary products, alcohol consumption, smoking etc.) and Social/Economic behaviour (family background, social environment, economic conditions, employment, working conditions etc.). A vigorous or morbid lifestyle will most likely be diffused across generations in a society. Case study shows that a child is 27% likely to adopt his/her parent's lifestyle.

2. Techniques

The bad lifestyle (Sedentary, laziness, alcohol, tobacco, smoking, drug and narcotic overdose, oil, sugary products) of a person may leads to several human disorders (Cardiovascular, diabetes, oral, ophthalmology, digestive) also known as lifestyle diseases. In adults, generally, the social and economic behaviour are responsible for commonly found lifestyle based diseases. The horrific lifestyle of an individual have significant role in oral diseases and thus an everlasting impact on ones life. Some of the major longevity diseases are given below:

· Cardiovascular	· Temporomandibular disorder
· Diabetes	· Ophthalmology
· Oral Cancer	· Glaucoma
· Gum disease	· Diabetic retinopathy
· Tingling	· Cataract
· Trauma	· Digestive System
· Bad breath	· Stomach Cancer
· Stroke	· Autism

Co-ordinator NAAC Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

Principal Govt. Bikram College of Commerce, Patiala

ISBN: 978-81-95645-5-5

Edit Delete

Multi-Objective Emperor Penguin Optimizer for Tuning the Quality-of-Service in Cloud Computing

Authors

Harsimran Kaur, Robin Singh Bhadoria

Publication date

2021/6/18

Conference

2021 10th IEEE International Conference on Communication Systems and Network Technologies (CSNT)

Pages

95-98

Publisher

IEEE

Description

In the present situation, researchers have the task of developing a high quality features based cloud computing system in the real world if service is desired on request. Quality of service (QoS) describes such parameters which carry out the non-functional activities for any real time based systems. Such services are normally sufficient to achieve these QoS. Most of the information technology (IT) companies offer different cloud based services to

ScienceDirect

Engineering Applications of Artificial Intelligence
Volume 96, November 2020, 104008

MOEPO: A novel Multi-objective Emperor Penguin Optimizer for global optimization: Special application in ranking of cloud service providers

Harsimran Kaur [a], Anurag Rai [b], Sarvjit Singh Bhatia [c], Gaurav Dhiman [d]

Show more

https://doi.org/10.1016/j.engappai.2020.104008
Get rights and content

Abstract

This study introduces the extension of currently developed *Emperor Penguin Optimizer (EPO)* in terms of multi-objective problems solving capability, which is entitled as *Multi-objective Emperor Penguin Optimizer (MOEPO)* In this algorithm, a concept of dynamic archive is introduced, which has the feature to cache the non-dominated *Pareto* optimal solutions. Here, the roulette-wheel approach is utilized to choose the effective archived solutions by simulating the huddling behaviors of emperor penguins. The proposed algorithm is approved by testing it with twenty-four well-known benchmark test functions, and its performance is compared with existing metaheuristic algorithms. The developed algorithm is analyzed on seven constrained problems of engineering to assess its appropriateness for finding solutions of real world problems. After, that it is validated on cloud computing application and compared between competitor approaches. By using the proposed algorithm, improvements in tackling the resource scheduling issue in cloud computing have been established. The outcomes from the empirical analyzes depict that the proposed algorithm is better than other existing algorithms.

Introduction

Metaheuristic techniques have gained more researchers scrutiny to solve problems of daily life (Singh and Dhiman, 2018a, Singh and Dhiman, 2018b, Dhiman and Kumar, 2018a, Singh et al., 2018b). Due to computationally inexpensive, these techniques have been extensively used on numerous engineering fields(Dhiman and Kumar, 2018b, Singh et al., 2018a, Dhiman et al., 2018). Hence, the distinctive of these approaches is to deal with multi-objectives. The multi-objective optimizer has the capability to deal with multiple objective functions together(Dhiman and Kaur, 2019b, Dhiman and Kumar, 2019a). In most of the cases, the

GYAN MANAGEMENT

39

Growth of Corporate Tax in India: An Analysis

Gurpreet Kaur
Research Scholar, Department of Commerce, Punjabi University, Patiala

Vaneeta Rani
Associate Professor, Department of Commerce, Govt. Bikram College of Commerce, Patiala

DOI: https://doi.org/10.48165/gm.2021.1529

Keywords: Corporate tax, Buoyancy, Growth, Revenue, Taxation

ABSTRACT

The direct tax contributes as a major source to the total tax revenue of the government. The biggest component of the direct tax, as well as total tax revenue of the government, is the Corporate Tax as it contributes around 1/3rd of the gross tax revenue of the government. So, it is very important to study the concept of corporate tax, growth in corporate tax revenue, growth in corporate assessees known as tax base, and the corporate tax to gross domestic product (GDP) relationship. The present study throws light on the growth perspective of corporate tax revenue and growth of corporate assessees in India. The corporate tax buoyancy has also been discussed in the paper to know the responsiveness of corporate tax revenue in comparison to the (GDP) of the country. The study has covered the period of 18 years from 2001-02 to 2018. The data has been taken from economic survey reports and the official websites of Income Tax, and Comptroller and Auditor General of India. The analyses of collected data have been carried out by using percentage, simple growth rate and compound annual growth rate.

DOWNLOADS

Govt. Bikram College of Commerce, Patiala-147001 IQAC Punjab

Criterion Incharge

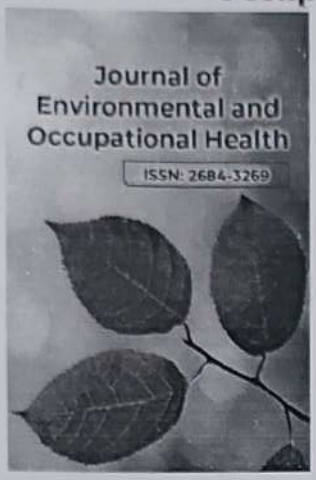
Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal
Govt. Bikram College of Commerce, Patiala.

38

E-ISSN: 2684-3269

Journal of Environmental and Occupational Health



Review - Journal of Environmental and Occupational Health (2021)

A transactional approach of occupational stress and behaviour pivotal to human error and leadership in Maritime

Vineet Kaur Sandhu* and Kusum Lata

[1]Department of Applied Management, Punjabi University, Patiala, Punjab, India

*Corresponding Author:
Vineet Kaur Sandhu, Department of Applied Management, Punjabi University, India, vin_sohal@hotmail.com

Received: 30-Dec-2020 Published: 30-Jan-2021

Abstract

Maritime is a safety-critical industry with total commitment to safety in all shipping operations. New technological advancements in the maritime industry create new kinds of failures and accidents. Although the total number of marine casualties and incidents has steadied over the last few years [1], they raise an ever-growing safety concern of 'human error' being a recurrent contributing factor. Further, the high cost of wreck removal and rising insurance claims also highlight crew negligence as a growing problem. The review of international maritime literature gives evidence of human element essential for the shipping business's safety and efficiency, various maritime factors are posing challenges to the health, safety, and environment at sea. Studies into human error have highlighted active and latent failures at different levels, the individual's pre-existing conditions and lack of competence to deal with are critical to errors. It is believed that an individual's perception of stress and coping skills are linked to the likelihood of errors and ineffective leadership, consequently affecting the system's success or failure. This paper draws attention to the transactional approach to the occupational stressors and human behaviour to understand the complex interactivity between the influencing factors causing the probability of human errors. It is concluded that the application of the classification of errors, awareness in psychological limitations and psycho-behavioural aspects of individuals, can help address the pre-condition level of unsafe acts and loss of competence to reduce the probability of human errors.

Keywords

Maritime industry; Human error; HFACS; Occupational stress; Human behaviour

Introduction

The topic of occupational stressors in maritime has been well-researched and psycho-social factors as the source of work-related stress at sea are also well-recognised [2]. Researchers have highlighted increased workload, lack of situational awareness and resulting fatigue, to play a significant role in many maritime accidents [3,4], the experience of stress in varying degrees is influencing the individual's personal and professional efficacy. Another contributing causative factor involved in accidents relates to lack of leadership skills, the decision-making failures, poor judgements and improper management of the crisis, all falling under the leader competency problems [5].

Maritime professionals are at the highest risk for stress [6], the term 'human error' can be considered an umbrella term [7], or just the tip of the iceberg. Compliance of maritime safety is highly governed by various regulations laid by the International Maritime Organisation (IMO) however, even the maritime regulatory regime falls to effectively address human factors and safety management challenges [8,9]. International safety

ISSN : 2348-0300

TEXT DOCUMENT CLUSTERING: A COMPREHENSIVE SURVEY

GEETANJALI GOYAL, Department of Computers, Assistant Professor, Government Bikram College of Commerce, Patiala, Email: goyal1961@gmail.com

Abstract

Knowledge discovery is a process of discovering useful knowledge from a collection of data. Data clustering is basically grouping the similar data into clusters. Clustering is a widely studied data mining problem. It has a lot of applications in classification, visualization, document organization and indexing. Document clustering is an effective tool to manage information overload as by grouping documents together a human observer can easily and quickly browse large documents and search engines can efficiently query large document collections among many other applications. This paper provides a detailed survey of the problem of text clustering. This paper also provides a brief description of different methods of text clustering along with their advantages and disadvantages.

Keywords: Data Mining, Data clustering, Clustering Techniques, Fuzzy logic.

Introduction

Clustering is a process in which data objects are organized into set of disjoint classes called clusters. Objects in the same cluster are similar to each other while different to the objects in different clusters. The clustering problem is a unsupervised learning problem. The problem of text clustering is basically finding groups of similar objects in the data. This similarity is measured by the use of a similarity function. The similarity function can be measured in terms of distance or on the basis of conceptual similarity between the data objects depending upon the method used.

1.1 Applications of Text Clustering

The applications of clustering are:

1. **Marketing:** Finding a group of customers with similar behavior from a large database containing their properties.
2. **Biology:** Classification of plants and animals on the basis of their properties.
3. **Library:** Ordering the books according to various criteria's.
4. **City Planning:** Identifying groups of houses according to the location, type of house etc.
5. **Insurance:** Identifying groups of different insurance policyholders.
6. **Earthquake studies:** Identifying dangerous zones by clustering earthquake epicenters.
7. **World Wide Web:** Document classification, clustering web-log data to discover groups of similar access patterns.

2. Background

Due to the advancement in the modern world all the data is converted into a text form. A large amount of data is available on the internet from

(37)

A RESEARCH JOURNAL OF HUMANITIES, COMMERCE AND SCIENCES OF DAV COLLEGE AMBALA

ISSN: 2348-0300 VOLUME : 7 & 8 ISSUES: 2019 & 2020

Annual Refereed Research Journal

Estd. in 1886

DAV COLLEGE (LAHORE)

AMBALA CITY-134003

College with Potential for Excellence

NAAC Re-accredited Grade 'A'

(Conferred Heritage Status by UGC)

Website: www.davcambala.in

| Vol. 34, No. 25, 1950201 (2019)

| Research Papers

36

No Access

A hybrid fuzzy quantum time series and linear programming model: Special application on TAIEX index dataset

Pritpal Singh, Gaurav Dhiman, Sen Guo, Ritika Maini, Harsimran Kaur, Amandeep Kaur... **See all authors** ›

https://doi.org/10.1142/S0217732319502018

Cited by: 19

< Previous

Next >

PDF

Help

About

PDF/EPUB

Recommend To Library

Abstract

Vol. 34 (2019) 1950032 (14 pages)
© World Scientific Publishing Company
DOI: 10.1142/S0217732319500329

35

DHIMAN: A novel algorithm for economic Dispatch problem based on optimization metHod usIng Monte Carlo simulation and Astrophysics coNcepts

Gaurav Dhiman*,‖, Pritpal Singh†, Harsimran Kaur‡,¶ and Ritika Maini‡,‖

*Computer Science and Engineering Department,
Thapar Institute of Engineering & Technology, Patiala 147004, Punjab, India
†Smt. Chandaben Mohanbhai Patel Institute of Computer Applications,
CHARUSAT Campus, Changa, Anand 388421, Gujarat, India
‡Department of Computer Science, Govt. Bikram College of Commerce,
Patiala 147001, Punjab, India
‖gdhiman0001@gmail.com; gaurav.dhiman@thapar.edu
†drpritpalsingh82@gmail.com
¶harsimranmahajan1980@gmail.com
‖maini_ritika@rediffmail.com

Received 24 September 2018
Revised 20 October 2018
Accepted 26 November 2018
Published 25 January 2019

This paper presents a new model using optimization approach for efficient prediction of load in real-life environment. Monte Carlo simulation and Schrödinger equations provide the effective number of solutions. This technique is useful in representation of relationships between different models. The proposed algorithm is verified and validated with various state-of-the-art approaches for solving economic load power dispatch problem to demonstrate its efficiency. Experimental results signify that the proposed algorithm is more precise than existing competing models.

Keywords: Astrophysics; Quantum; Schrödinger; Monte Carlo.

PACS No.: 03.70.+k

1. Introduction

The economic dispatch (ED) is the problem of minimizing the operating cost and scheduling all the generating units while satisfying the constraints.[1] The ED problem is defined as a non-smooth optimization problem because of valve-point

¶Corresponding author

effects and multi-fuel effects. These effects may raise a problem in finding the global

Panchbati Sandesh (Interdisciplinary Research Journal)
Vol. 41 Issue 1, April-2019 - 59-65

Panchbati Sandesh
Interdisciplinary
Research Journal

Farmer Suicides: Causes and Remedial Measures in Punjab

Gazal Aggarwal & Dr. Narinder Kaur***
*Assistant Professor, Govt. Bikram College of Commerce, Patiala.
**Professor, Govt. Bikram College of Commerce, Patiala.

Introduction

The state of Punjab located in North West India is surrounded by the Jammu & Kashmir in the North, the hilly state of Himachal Pradesh in the East and the State of Haryana and Rajasthan in the South. It covers geographical area of 50362 square kilometers.

The State of Punjab has been showcased as an Indian agricultural success story since the Green Revolution, which was the part of development initiatives undertaken by developed countries in the late 1960s & 1970s to aid developing countries in increasing their crop yield. Yet, since this time there has been a steady increase in the number of economically related suicides by Punjabi farmers. During the Green Revolution, production was improved with the use of modified seeds that increased yield only when combined with expensive chemical, fertilizers & irrigation. Unable to afford sufficient amounts of these expensive inputs, small farmers found their holding becoming progressively less profitable. Meanwhile, grain prices remained comparatively low even as input costs increased. Now, three decades later, the small and marginal farmers of Punjab are trying to pursue environmentally and economically unsustainable agrarian practices, thus accumulating high debt while lacking alternative sources of income. Due to faulty agrarian policies, peasants of Punjab are reeling under heavy debt and are not in a position to repay loans of commission agents, money lenders, land development banks, co-operative societies, commercial

Edit Delete

33

[PDF] from edgehill.ac.uk

A novel hybrid evolutionary algorithm based on hypervolume indicator and reference vector adaptation strategies for many-objective optimization

Authors

Hari Mohan Pandey, Gaurav Dhiman, Mukesh Soni, Adam Slowik, Harsimran Kaur

Publication date

2020/2/25

Journal

Engineering with Computers

Pages

EWCO-D-19-00247R1

Publisher

Springer London

Description

A novel hybrid many-objective evolutionary algorithm called Reference Vector Guided Evolutionary Algorithm based on hypervolume indicator (H-RVEA) is proposed in this paper. The

Vol. 34 (2019) 1950201 (20 pages)
© World Scientific Publishing Company
DOI: 10.1142/S0217732319502018

32

A hybrid fuzzy quantum time series and linear programming model: Special application on TAIEX index dataset

Pritpal Singh*,**, Gaurav Dhiman†,††, Sen Guo‡,‡‡, Ritika Maini§,§§, Harsimran Kaur¶,¶¶, Amandeep Kaur‖,‖‖, Harmanpreet Kaur¶,***, Jaswinder Singh†††,††† and Napinder Singh‖,‖‖‖

*Smt. Chandaben Mohanbhai Patel Institute of Computer Applications, CHARUSAT Campus Changa, Anand 388421, Gujarat, India
†Computer Science and Engineering Department, Thapar Institute of Engineering & Technology, Patiala 147004, Punjab, India
‡School of Economics and Management, North China Electric Power University, Beijing 102206, P. R. China
§Department of Computer Science, Govt. Bikram College of Commerce, Patiala 147004, Punjab, India
¶Plant and Soil Department, Texas Tech University, Lubbock, TX 79409, USA
‖Department of Computer Science and Engineering, Desh Bhagat University, Mandi Gobindgarh 147301, Punjab, India
**drpritpalsingh8@gmail.com
††gdhiman0001@gmail.com; gaurav.dhiman@thapar.edu
‡‡guosen@ncepu.edu.cn
§§maini_ritika@rediffmail.com
¶¶harsimranmanhajan1980@gmail.com
‖‖sweetchinloo2008@gmail.com; kaur.amandeep@thapar.edu
***harmanpreet.kaur@ttu.edu
†††jass724@gmail.com
‡‡‡napinder.bhawal82@gmail.com

Received 6 March 2019
Accepted 15 April 2019
Published 18 June 2019

The supremacy of quantum approach is able to provide the solutions which are not practically feasible on classical machines. This paper introduces a novel quantum model for time series data which depends on the appropriate length of intervals. In this study, the effects of these drawbacks are elaborately illustrated, and some significant measures to remove them are suggested, such as use of degree of membership along with mid-value of the interval. All these improvements signify the effective results in case of quantum time series, which are verified and validated with real-time datasets.

Keywords: Quantum; time series; logical relationships; intervals.

PACS No.: 03.67.Ac

***Corresponding author.

A Novel CBIR-Based System using Texture Fused LBP Variants and GLCM Features

Meenakshi Garg, Manisha Malhotra, Harpal Singh

Abstract: This paper presents Multiple-features extraction and reduction for Content-Based Image Retrieval (CBIR). At first, discrete wavelet transform (DWT) is applied on the R, G and B channels to get multi-level decomposition of the image in which approximation and detailed coefficients are extracted. Approximation coefficients contain the main content of the image while detailed coefficients provide the local noise variation in the image. Further computationally efficient and rotation-invariant Dominant-Rotated Local Binary Pattern called a texture descriptor is applied on all approximation and detailed coefficients. By calculating the descriptor relative to reference in a local neighbor patch, a rotation invariance feature image is obtained. The proposed methodology contains the complete structural information extracted by the Local Binary Patterns and also extract the extra information using the information of magnitude, thus attaining extra discriminative power. Then, by getting the Dominant Rotated Local Binary Pattern image, concept of GLCM has been used to extract the statistical characteristics for the classification of texture images. GLCM directly works with the intensity of the images and also provides the spatial relationship of the pixels in the image by calculating frequency of occurring of similar patterns in different directions which makes it useful for the extraction of texture characteristics. GLCM has been improvised into a generalized co-occurrence matrix that extracts significant spatial properties from the distribution of local maxima. Further Median Robust Extended Local Binary Pattern is extracted out of the approximation and detailed coefficients and also the histogram is calculated out of them. Unlike the traditional LBP method and several variants of the LBP, Median Robust Extended Local Binary Pattern compares the local median of images instead of intensities of the raw images. It is a multiscale LBP-type descriptor that proficiently compares the image medians with novel sampling schemes, capable of capturing both microstructure and macrostructure. Further feature concatenation is applied in which GLCM features of DRLBP and histogram of MRELBP are combined for getting a large feature vector. Further, we applied a mutual information concept to sort out the most differentiable features for all categories of CORAL dataset which are further fed to particle swarm optimization-based feature selector which reduced the number of features that can be used in the classification phase. PSO uses the SVM classifier in evaluating its objective function which is average precision value for the selected features. PSO tries to increase precision value for all the categories and provides a feature vector with a large precision value when classify by SVM. Further three classifiers are trained ad tested named SVM, KNN and decision tree in which SVM gives high accuracy and precision rates of classification. Experimental results show above 94% accuracy and .80 to .90 precision values for most of the categories of CORAL dataset.

Keywords: CBIR, MLBP, DRLBP, PSO, SVM, Feature selection, classification etc.

Revised Manuscript Received on December 05, 2019.

Meenakshi Garg, University Institute of Computing, Chandigarh University, Mohali, Punjab, India. Email: meenagarg82@gmail.com
Manisha Malhotra, University Institute of Computing, Chandigarh University, Mohali, Punjab, India. Email: mmanishamalhotra@gmail.com
Harpal Singh, Department of Electronics and Communication Engineering, BEC Landran, Punjab, India. Email: HarpalECE@cgc.edu.in

I. INTRODUCTION

Image Retrieval based on Content (CBIR) is the most significant area of image processing and computer vision. It has been utilized in various fields of application such as medicine, health, cultural heritage, crime prevention, etc. SPIRS [1] and IRMA [2] in medication etc. CBIR is a well-defined technique for the search and retrieval of images in a large data-set based upon its visual contents. Image retrieval is characterized by the local or global characteristics based on visual contents. Global characteristics are defined by the properties of the images, like color, shape, and texture [3]. In CBIR, Color is a commonly used visual feature and mostly explored in the literature. The key objective is that human beings tend to distinguish images mainly by colored lines [4]. Texture also is an important property of surfaces in images and defined by similarity of the visual-patterns which represents the most important information related to the image surface such as bricks, tiles, clouds etc. Such descriptors are also fit for the recovery of medical images. The shape descriptors do not mean that it describes the whole image shape, but it describes the shape of particular region of an image. Forms are frequently utilized for segmentation [5] or contour detection [6]. Methods that are used for the shape descriptors are invariance for translation, rotation, and scaling [7]. Local features of an image have been used effectively for the recognition and classification of object categories and retrieved from a collection of points of interest and regions [8]. Since 1990s, the recovery of images from the data-sets by using the visual contents has been turned into an especially dynamic research topic. However, most studies do not adequately consider the semantic aspect of images, which comprises the fundamental of the semantic gap between the outcomes returned by the system and the perception of the user.

The CBIR model contains three main steps as shown in figure1. Firstly, feature extraction from an image and selection of features are performed. Secondly, the similarity measures are calculated. Finally, indexing of features and recovery are performed. The methods of extracting and selecting the characteristics rely upon the particular region of an image or upon the entire image [9]. Descriptors are often evaluated by using the spatial information texture, shape and colors etc. and global descriptors are utilized for image-retrieval. The utilization of the local descriptors increases in the recent years as these are remain constant with similar characteristics, with the difference that the local descriptors are extracted from the image regions instead of the entire image [10].

Modern Physics Letters A
Vol. 34 (2019) 1950285 (31 pages)

DOI: 10.1142/S0217732319502857

30

Comparison of deep learning techniques on content based image retrieval

Meenakshi Garg*,‡, Manisha Malhotra* and Harpal Singh†
*University Institute of Computing, Chandigarh University, Mohali, Punjab, India
†Department of Electronics and Communication Engineering, CEC Landran, Punjab, India
‡meenagarg82@gmail.com

Received 14 March 2019
Revised 5 June 2019
Accepted 12 June 2019
Published 12 September 2019

Content based Image Retrieval is mostly utilized to extract the pictures from large database. CBIR, which is additionally known as "Query by image" is a technology allowing organizing the computerized Images by their visible attributes. Or, in other words, CBIR is a method for retrieving pictures dependent not on annotations or keywords, but dependent on the feature taken out straightly from the pictures database. CBIR systems are dependent on the utilizations of computer vision methods to the image retrieval issue in huge databases. CBIR is technology of recovering the utmost visually identical pictures to a specified query picture from a cluster or database of pictures. It is useful in a lot of areas like Photography to search images from the database, medical diagnosis etc. Physically annotating the pictures by inputting the metadata or keywords in a huge database can be laborious and might not capture the keyword anticipated to define that picture. CBIR supports in recovering identical pictures from an database of pictures deprived of pictures annotation. In this paper, we are compare the Deep Neural Networks and Neuro-Fuzzy Classifier, both have different outcomes and different results to predict the image. The comparison of our proposed methods Neuro-fuzzy classification and deep neural network shows that the improvement in accuracy. The accuracy values 71.6% and 73.4% for DNN and Neuro-Fuzzy Classifier[12] method. The visual and qualitative results are presented for validation of the proposed method.

Keywords: Deep neural networks; neuro-fuzzy classifier; CBIR, machine learning; statistical modeling.

1. Introduction

Automatic retrieval of image turned into an imperative research issue considering its utilization in taking care of the gigabytes of unlabeled picture information that is produced and kept digitally in giant repositories, comprising visual information

‡Corresponding author.

ScienceDirect

Computers & Electrical Engineering
Volume 92, June 2021, 107186

Automatic detection of cyberbullying using multi-feature based artificial intelligence with deep decision tree classification ☆

Natarajan Yuvaraj [a], Victor Chang [b], Balasubramanian Gobinathan [c], Arulprakash Pinagapani [d], Srihari Kannan [e], Gaurav Dhiman [f], Arsath Raja Rajan [g]

Show more

https://doi.org/10.1016/j.compeleceng.2021.107186
Get rights and content

Abstract

Recent studies have shown that cyberbullying is a rising youth epidemic. In this paper, we develop a novel automated classification model that identifies the cyberbullying texts without fitting them into large dimensional space. On the other hand, a classifier .cannot provide a limited convergent solution due to its overfitting problem. Considering such limitations, we developed a text classification engine that initially pre-processes the tweets, eliminates noise and other background information, extracts the selected features and classifies without data overfitting. The study develops a novel Deep Decision Tree classifier that utilizes the hidden layers of Deep Neural Network (DNN) as its tree node to process the input elements. The validation confirms the accuracy of classification using the novel Deep classifier with its improved text classification accuracy.

Introduction

With rapid urbanization and globalization, modern cities face challenges in maintaining development and qualified living for its citizens. The smart cities emerged such challenges with the integration of immersive technologies [1]. The assessment of online content from the social media platform in smart cities can be regarded as a vital asset that remains a critical challenge [2].

Cyberbullying (CB) is an electronic form of bullying [3,4] that creates an intentional and aggression committed by a group or an individual against another group or an individual on social media platforms [7]. CB has hatred messages that are transmitted via social networking, emails, etc. through personal or public computers or through personal mobile phones. This has aroused as a serious threat among nations [1].

28

A Review on Machine-learning Based Code Smell Detection Techniques in Object-oriented Software System(s)

Authors: Kaur, Amandeep; Jain, Sushma; Goel, Shivani; Dhiman, Gaurav
Source: Recent Advances in Electrical & Electronic Engineering (Formerly Recent Patents on Electrical & Electronic Engineering), Volume 14, Number 3, 2021, pp. 290-303(14)
Publisher: Bentham Science Publishers
DOI: https://doi.org/10.2174/2352096513999200922125839

11

Abstract | References | Citations | Supplementary Data

Background: Code smells are symptoms that something may be wrong in software systems that can cause complications in maintaining software quality. In literature, there exist many code smells and their identification is far from trivial. Thus, several techniques have also been proposed to automate code smell detection in order to improve software quality.

Objective: This paper presents an up-to-date review of simple and hybrid machine learning-based code smell detection techniques and tools.

Methods: We collected all the relevant research published in this field till 2020. We extracted the data from those articles and classified them into two major categories. In addition, we compared the selected studies based on several aspects like code smells, machine learning techniques, datasets, programming languages used by datasets, dataset size, evaluation approach, and statistical testing.

Results: A majority of empirical studies have proposed machine-learning based code smell detection tools. Support vector machine and decision tree algorithms are frequently used by the researchers. Along with this, a major proportion of research is conducted on Open Source Softwares (OSS) such as Xerces, Gantt Project and ArgoUml. Furthermore, researchers pay more attention to Feature Envy and Long Method code smells.

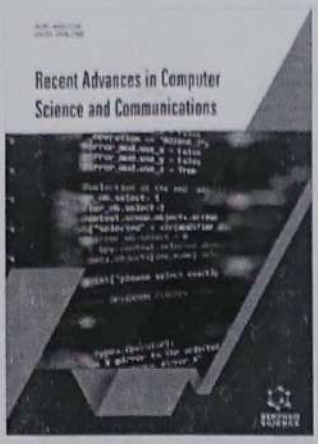
Conclusion: We identified several areas of open research like the need for code smell detection techniques using hybrid approaches, the need for employing valid industrial datasets, etc.

Keywords: Code smells; Open Source Softwares (OSS); anti-patterns; industrial datasets; machine learning; software maintenance
Document Type: Review Article
Publication date: 01 May 2021

A Spring Search Algorithm Applied to Engineering Optimization Problems

by Mohammad Dehghani [1], Zeinab Montazeri [1], Gaurav Dhiman [2], O. P. Malik [3], Ruben Morales-Menendez [4], Ricardo A. Ramirez-Mendoza [4,*], Ali Dehghani [5], Josep M. Guerrero [6] and Lizeth Parra-Arroyo [4]

1 Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz 71557-13876, Iran
2 Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab 147004, India
3 Department of Electrical and Computer Engineering, University of Calgary, Calgary, AB T2N 1N4, Canada
4 School of Engineering and Sciences, Tecnologico de Monterrey, Monterrey 64849, Mexico
5 Department of Civil Engineering, Islamic Azad Universities of Estahban, Estahban 74, Iran
6 CROM Center for Research on Microgrids, Department of Energy Technology, Aalborg University, 9220 Aalborg, Denmark



Task Scheduling in Cloud Using ACO

26

Authors: Natarajan, Yuvaraj; Kannan, Srihari; Dhiman, Gaurav
Source: Recent Advances in Computer Science and Communications (Formerly: Recent Patents on Computer Science), Volume 15, Number 3, 2022, pp. 348-353(6)
Publisher: Bentham Science Publishers
DOI: https://doi.org/10.2174/2666255813999200831112705

8

Abstract | References | Citations | Supplementary Data

Background: Cloud computing is a multi-tenant model for computation that offers various features for computing and storage based on user demand. With increasing cloud users, the usage increases that highlights the problem of load balancing with limited resource availability based on dynamic cloud environment. In such cases, task scheduling creates fundamental issue in cloud environment.

Introduction: Certain problems such as inefficiencies in load balancing latency, throughput ratio, proper utilization of the cloud resources, better energy consumption and response time have been observed. These drawbacks can be efficiently resolved through the incorporation of efficient load balancing and task scheduling strategies.

Method: In this paper, we develop an efficient co-operative method to solve the most recent approaches against load balancing and task scheduling that has been proposed using Ant Colony Optimization (ACO). These approaches enable the clear cut identification of the problems associated with the load balancing and task scheduling strategies in the cloud environment.

Results: The simulation is conducted to find the efficacy of the improved ACO system for load balancing in cloud than the other methods. The result shows that the proposed method obtains reduced execution time, reduced cost and delay.

Conclusion: A unique strategic approach is developed in this paper, Load Balancing, which works with the ACO in relation to the cloud workload balancing task through the incorporation of the ACO technique. The strategy for determining the applicant nodes is based on which the load balancing approach would essentially depend. By incorporating two different approaches: the maximum minute rules and the forward-backward ant, this reliability task can be established. This method is intended to articulate the initialization of the pheromone and thus upgrade the relevant cloud-based physical properties.

Keywords: ACO; Load balancing; cloud computing; task scheduling; virtualization
Document Type: Research Article
Publication date: 01 March 2022
More about this publication?

Received: August 10, 2020. Revised: August 30, 2020.

INASS

International Journal of
Intelligent Engineering & Systems

http://www.inass.org/

25

MLO: Multi Leader Optimizer

Mohammad Dehghani[1]* Zeinab Montazeri[1] Ali Dehghani[2]
Ricardo A. Ramirez-Mendoza[3] Haidar Samet[4] Josep M. Guerrero[5] Gaurav Dhiman[6]

[1]*Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, I.R. Iran*
[2]*Department of Civil Engineering, Islamic Azad Universities of Estahban Estahban, I.R. Iran*
[3]*Tecnológico de Monterrey, Monterrey NL, 64,489, Mexico*
[4]*Department of Power and Control Engineering, School of Electrical and Computer Engineering, Shiraz University, Shiraz, Iran*
[5]*Center for Research on Microgrids (CROM), Department of Energy Technology, Aalborg University, Aalborg, Denmark*
[6]*Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab 147004, India*
* Corresponding author's Email: m.dehghani@sutech.ac.ir

Abstract: Optimization is a topic that has always been discussed in all different fields of science. One of the most effective techniques for solving such problems is optimization algorithms. In this paper, a new optimizer called Multi-Leader optimizer (MLO) is developed in which multiple leaders guide members of the population towards the optimal answer. MLO is mathematically modelled based on the process of advancing members of the population and following the leaders. MLO performance in optimization is examined on twenty-three standard objective functions. The results of this optimization are compared with the results of the other eight existing optimization algorithms including Genetic Algorithm (GA), Particle Swarm Optimization (PSO), Teaching-Learning-Based Optimization (TLBO), Gray Wolf Optimizer (GWO), Grasshopper Optimization Algorithm (GOA), Emperor Penguin Optimizer (EPO), Shell Game Optimization (SGO), and Hide Objects Game Optimization (HOGO). Based on the analysis of the simulation results on unimodal test functions to evaluate exploitation ability and multimodal test functions in order to evaluate exploration ability, it has been determined that MLO has a higher ability to solve optimization problems than existing optimization algorithms.

Keywords: Optimization, Optimizer, Multi leader optimizer, Swarm-based optimization, Optimization algorithms.

1. Introduction

Each optimization problem is modeled in three main parts: primary objectives (constraints), secondary objectives (objective functions), and decision variables (problem variables). Primary objectives, which are the most important part of an optimization problem, include limitations and constraints that should be the first priority in solving the problem. Secondary objectives are the objective functions of the problem that should actually be the minimum or maximum objective based on the conditions required in the problem. Achieving secondary goals must be done by considering the primary objectives and observing all the constraints and limitations.

After mathematical modeling of an optimization problem, it must be solved using the appropriate method. There are different methods for solving optimization problems. Optimization algorithms with high power in solving optimization problems are always considered as one of the effective methods of solving optimization problems [1]. In this regard, optimization algorithms have been applied by scientists in various fields such as energy [2], protection [3], distribution systems [4, 5], storage designing [6], electrical engineering [7, 8], energy commitment [9], and energy carriers [10, 11] to achieve the optimal solution. Optimization

 DOI: 10.22266/ijies2020.1231.32

UNIVERSAL WISER PUBLISHER

Make your new perspectives accessible for building a better world

Register
Login

AIE Current Archives Submission Editorial Team About Publisher

(24)

An Innovative Approach for Face Recognition Using Raspberry Pi

Srihari. K

Department of CSE, SNS College of Technology, Coimbatore, Tamilnadu, India

Ramesh. R

Department of ECE, KIT-Kalaignarkarunanidhi Institute of Technology, Coimbatore, Tamilnadu, India

Udayakumar. E

Department of ECE, KIT-Kalaignarkarunanidhi Institute of Technology, Coimbatore, Tamilnadu, India

Gaurav Dhiman

Department of CSE, Government Bikram college of Commerce, Patiala, India

DOI: https://doi.org/10.37256/aie.12202062

Keywords: face recognition, liveness detection, raspberry pi, image quality assessment, eigen face vector and biometrics

Abstract

The biometrics is now a days trending security method used in the industries. The face recognition is one way of applying biometrics, and liveness detection is add on security to the system which will help the security system to identify between the fake and the real identities. In this case the fake identities are photographs as printed media. And mobile or tablet as display devices. The entire system is developed on the raspberry pi board because of it efficiency with powerful architecture and theportability.

A | I | E
Artificial Intelligence Evolution

PDF

ublished
020-08-08

ow
...i. K, Ramesh. R, Udayakumar. E, Gaurav Dhiman.
...Innovative Approach for Face Recognition Using
...berry Pi. Artificial Intelligence Evolution [Internet].
...20 Aug. 8 [cited 2023 Feb. 13];1(2):102-7. Available
...://ojs.wiserpub.com/index.php/AIE/article/view/62

IQAC Govt. Bikram College of Commerce Patiala-147001 Punjab

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal,
Govt. Bikram College of Commerce, Patiala

Original Article | Published: 09 September 2020

23-(1)

EMoSOA: a new evolutionary multi-objective seagull optimization algorithm for global optimization

Gaurav Dhiman, Krishna Kant Singh, Adam Slowik, Victor Chang, Ali Riza Yildiz, Amandeep Kaur & Meenakshi Garg

International Journal of Machine Learning and Cybernetics
12, 571–596 (2021)

Abstract

This study introduces the evolutionary multi-objective version of seagull optimization algorithm (*SOA*), entitled Evolutionary Multi-objective Seagull Optimization Algorithm (*EMoSOA*). In this algorithm, a dynamic archive concept, grid mechanism, leader selection, and genetic operators are employed with the capability to cache the solutions from the non-dominated *Pareto*. The roulette-wheel method is employed to find the appropriate archived solutions. The proposed algorithm is tested and compared with state-of-the-art metaheuristic algorithms over twenty-four standard benchmark test functions. Four real-world engineering design problems are validated using proposed *EMoSOA* algorithm to determine its adequacy. The findings of empirical research indicate that the proposed algorithm is better than other algorithms. It also takes into account those optimal solutions from the *Pareto* which shows high convergence.

Received: April 16, 2020. Revised: July 3, 2020.

INASS

International Journal of
Intelligent Engineering & Systems

http://www.inass.org/

Darts Game Optimizer: A New Optimization Technique Based on Darts Game

Mohammad Dehghani[1]* Zeinab Montazeri[1] Hadi Givi[2]
Josep M. Guerrero[3] Gaurav Dhiman[4]

[1]*Department of Electrical and Electronics Engineering, Shiraz University of Technology, Shiraz, Iran*
[2]*Department of Electrical Engineering, Faculty of Engineering, University of Shahreza, Shahreza 86481-41143, Iran*
[3]*Center for Research on Microgrids (CROM), Department of Energy Technology, Aalborg University, Aalborg, Denmark*
[4]*Department of Computer Science, Government Bikram College of Commerce, Patiala, Punjab 147004, India*
* Corresponding author's Email: adanbax@gmail.com

Abstract: In this paper, a novel game-based optimization technique entitled darts game optimizer (DGO) is proposed. The novelty of this investigation is DGO designing based on simulating the rules of Darts game. The key idea in DGO is to get the most possible points by the players in their throws towards the game board. Simplicity of equations and lack of control parameters are the main features of the proposed algorithm. The ability and quality of DGO performance in optimization is evaluated on twenty-three objective functions, and then is compared with eight other optimization algorithms including Genetic Algorithm (GA), Particle Swarm Optimization (PSO), Gravitational Search Algorithm (GSA), Teaching Learning-Based Optimization (TLBO), Grey Wolf Optimizer (GWO), Grasshopper Optimization Algorithm (GOA), Whale Optimization Algorithm (WOA), and Marine Predators Algorithm (MPA). The results of simulation and comparison indicate the superiority and optimal quality of the proposed DGO algorithm over the mentioned algorithms.

Keywords: Optimization, Optimizer, Darts game, Darts game optimizer, Game-based algorithm.

1. Introduction

1.1 Motivation

There are many optimization problems in different disciplines of science and technology that need to be solved using appropriate optimization methods. Hence, employing an effective optimization algorithm is of great importance for solving such problems. In this regard, optimization algorithms have been applied by scientists in various fields such as energy [1], protection [2], electrical engineering [3-6], energy carriers [7,8], and data mining [9] to achieve the optimal solution. This issue motivates researchers to focus on optimization studies, modification of existing methods, and especially introduction of new optimization methods.

1.2 Background

In general, optimization algorithms can be categorized into four groups including physics-based, swarm-based, evolutionary-based, and game-based algorithms.

Physics-based algorithms are designed based on simulation and application of existing laws in physics. For example, the spring search algorithm (SSA) is designed using Hawk's law in the weight and spring system. In SSA, the members of the population are a number of weights that are connected to each other by a spring and the optimal answer is provided by reaching the equilibrium point [10, 11]. Some of the other algorithms in this category are Ray Optimization (RO) algorithm [12], Black Hole (BH) algorithm [13], Artificial Chemical Reaction Optimization Algorithm (ACROA) [14], Charged

21

Analysis of protein-ligand interactions of SARS-CoV-2 against selective drug using deep neural networks

Publisher: TUP Cite This PDF

Natarajan Yuvaraj ; Kannan Srihari ; Selvaraj Chandragandhi ; Rajan Arshath Raja ; Ga... All Authors

Abstract: In recent time, data analysis using machine learning accelerates optimized solutions on clinical healthcare systems. The machine learning methods greatly offer an efficie... View more

▸ **Metadata**

Abstract:
In recent time, data analysis using machine learning accelerates optimized solutions on clinical healthcare systems. The machine learning methods greatly offer an efficient prediction ability in diagnosis system alternative with the clinicians. Most of the systems operate on the extracted features from the patients and most of the predicted cases are accurate. However, in recent time, the prevalence of COVID-19 has emerged the global healthcare industry to find a new drug that suppresses the pandemic outbreak. In this paper, we design a Deep Neural Network (DNN) model that accurately finds the protein-ligand interactions with the drug used. The DNN senses the response of protein-ligand interactions for a specific drug and identifies which drug makes the interaction that combats effectively the virus. With limited genome sequence of Indian patients submitted to the GISAID database, we find that the DNN system is effective in identifying the protein-ligand interactions for a specific drug.

Published in: Big Data Mining and Analytics (Volume: 4 , Issue: 2, June 2021)

Page(s): 76 - 83

INSPEC Accession Number: 20349085

Date of Publication: 01 February 2021

DOI: 10.26599/BDMA.2020.9020007

Electronic ISSN: 2096-0654

Publisher: TUP

The Effects of Coronavirus (COVID-19) on the Psychological Health of Indian Poultry Farmers

Author(s): Gaurav Dhiman*

Volume 2, Issue 2, 2021
Published on: 17 June, 2020
Page: [131 - 132]
DOI: 10.2174/2666796701999200617160755

20

Pages: 2

Download Article

References

Download Options Rights & Permissions Print Export Cite as

Article Metrics

PDF	HTML
7	1

IQAC Govt. Bikram College of Commerce, Patiala-147001 Punjab

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal,
Govt. Bikram College of Commerce, Patiala

MoSSE: a novel hybrid multi-objective meta-heuristic algorithm for engineering design problems

Gaurav Dhiman ✉ & Meenakshi Garg

19

Soft Computing **24**, 18379–18398 (2020)

HKn-RVEA: a novel many-objective evolutionary algorithm for car side impact bar crashworthiness problem

Gaurav Dhiman and Amandeep Kaur

Published Online:September 23, 2020pp 257-284https://doi.org/10.1504/IJVD.2019.109869

ABOUT

Abstract

In this paper, a novel hybrid many-objective evolutionary algorithm, named as hypervolume indicator based on knee point driven and reference vector guided evolutionary algorithm (HKn-RVEA) is proposed. HKn-RVEA is based on the hypervolume indicator, knee points, and reference vector adaptation strategies. The knee points are used to improve the search ability. The reference vectors are used to decompose the optimisation problem into a number of sub-problems. In the proposed algorithm, an adaptation strategy is used to adjust the distribution of the knee points and reference vectors. The proposed algorithm is compared with five well-known evolutionary algorithms over standard benchmark test functions. The results show the performance of HKn-RVEA is better than the competitor algorithms in terms of inverted generational distance (IGD) and hypervolume (HV) performance measures. HKn-RVEA is also applied to real-life car side crashworthiness problem to demonstrate its efficiency. The experimental results show that the proposed algorithm is able to solve many-objective real-life problems.

Keywords

many-objective optimisation, HypE, hypervolume estimation algorithm, reference vector guided evolutionary algorithm, RVEA, knee points, convergence, diversity

Previous Article **Next Article**

Collections

Computing and Mathematics

Economics and Finance

Education, Knowledge and Learning

Energy and Environment

Healthcare and Biosciences

Management and Business

Public Policy and Administration

Risk, Safety and Emergency Management

Science, Engineering and Technology

Society and Leisure

Information

Help/FAQ

For Authors

Interested in publishing with Inderscience?

About Inderscience

Original Article | Published: 06 June 2020

(17) -1

A novel content-based image retrieval approach for classification using GLCM features and texture fused LBP variants

Meenakshi Garg & Gaurav Dhiman

Neural Computing and Applications **33**, 1311–1328 (2021)

Abstract

This paper presents a content-based image retrieval technique that focuses on extraction and reduction in multiple features. To obtain multi-level decomposition of the image by extracting approximation and correct coefficients, discrete wavelet transformation is applied to the *RGB* channels initially. Therefore, both approximation and correct coefficients are applied to the dominant rotated local binary pattern termed as texture descriptor which is computationally effective and rotationally invariant. For a local neighbor patch, a rotation invariance function image is obtained by measuring the descriptor relative to the reference. The proposed approach contains the complete structural information extracted from the local binary patterns and also extracts the additional information using the information of magnitude, thereby achieving extra discriminative power. Then, *GLCM* description is used by obtaining the dominant rotated local binary pattern image to extract the statistical characteristics for texture image classification. The proposed technique is applied to *OT[14]* dataset with the help of particle swarm optimization based feature selector to minimize the number of features that can be used during the

Co-ordinator NAAC Govt. Bikram College of Commerce, Patiala.

Criterion Incharge

IQAC Govt. Bikram College of Commerce, Patiala

Principal, Govt. Bikram College of Commerce, Patiala

Original Research | Published: 06 October 2020

(16) -2

A novel algorithm for global optimization: Rat Swarm Optimizer

Gaurav Dhiman, Meenakshi Garg, Atulya Nagar, Vijay Kumar & Mohammad Dehghani

Journal of Ambient Intelligence and Humanized Computing
12, 8457–8482 (2021)

Abstract

This paper presents a novel bio-inspired optimization algorithm called Rat Swarm Optimizer (RSO) for solving the challenging optimization problems. The main inspiration of this optimizer is the chasing and attacking behaviors of rats in nature. This paper mathematically models these behaviors and benchmarks on a set of 38 test problems to ensure its applicability on different regions of search space. The RSO algorithm is compared with eight well-known optimization algorithms to validate its performance. It is then employed on six real-life constrained engineering design problems. The convergence and computational analysis are also investigated to test exploration, exploitation, and local optima avoidance of proposed algorithm. The experimental results reveal that the proposed RSO algorithm is highly effective in solving real world optimization problems as compared to other well-known optimization algorithms. Note that the source codes of the proposed technique are available at: http://www.dhimangaurav.com.

A New Methodology Called Dice Game Optimizer for Capacitor Placement in Distribution Systems

Electrical Engineering & Electromechanics, 0(1), 61–64, 2020. doi:10.20998/2074-272x.2020.1.10

4 Pages
Posted: 4 Mar 2021

15

M. Dehghani
Shiraz University of Technology

Z. Montazeri
Shiraz University of Technology

O.P. Malik
University of Calgary

K. Al-Haddad
University of Quebec in Montreal

J.M. Guerrero
Aalborg University

G. Dhiman
Government Bikram College of Commerce

Date Written: February 19, 2020

Abstract

Purpose. Shunt capacitors are installed in power system for compensating reactive power. Therefore, feeder capacity releases, voltage profile improves and power loss reduces. However, determination optimal location and size of capacitors in distribution systems is a complex optimization problem. In order to determine the optimum size and location of the capacitor, an objective function which is generally defined based on capacitor installation costs and power losses should be minimized According to operational limitations. This paper offers a newly developed metaheuristic technique, named dice game optimizer to determine optimal size and location of capacitors in a distribution network. Dice game optimizer is a game based optimization technique that is based on the rules of the dice game.

Keywords: capacitor placement, dice game optimizer, distribution systems, optimization algorithm

Original Article | Published: 25 February 2020

A novel hybrid hypervolume indicator and reference vector adaptation strategies based evolutionary algorithm for many-objective optimization

Gaurav Dhiman, Mukesh Soni, Hari Mohan Pandey, Adam Slowik & Harsimran Kaur

Engineering with Computers **37**, 3017–3035 (2021)

Abstract

A novel hybrid many-objective evolutionary algorithm called Reference Vector Guided Evolutionary Algorithm based on hypervolume indicator (H-RVEA) is proposed in this paper. The reference vectors are used in a number of sub-problems to decompose the optimization problem. An adaptation strategy is used in the proposed algorithm to adjust the reference vector distribution. The proposed algorithm is compared over well-known benchmark test functions with five state-of-the-art evolutionary algorithms. The results show H-RVEA's superior performance in terms of the inverted generational distance and hypervolume performance measures than the competitor algorithms. The suggested algorithm's computational complexity is also analysed. The statistical tests are carried out to demonstrate the statistical significance of the proposed algorithm. In order to demonstrate its efficiency, H-RVEA is also applied to solve two real-life constrained many-objective optimization problems. The experimental results indicate that the proposed algorithm can solve the many-objective real-life problems. Note that the source codes of the

Tunicate Swarm Algorithm: A new bio-inspired based metaheuristic paradigm for global optimization

March 2020 Engineering Applications of Artificial Intelligence 90

Authors:

Satnam Kaur

Lalit K. Awasthi
National Institute of Technology, Hamirpur

Amrit Lal Sangal
National Institute of Technology Jalandhar Punjab India

Gaurav Dhiman
Government Bik

Citations (234) References (51)

No full-text available

The tunicate swarm algorithm (TSA) is a recent population-based stochastic optimization ... et al. (2020) in order to solve continuous tasks. In this study, an approach has proposed for ... tunicate swarm algorithm (TSA) and transfer functions. ...
TSA is a population-based stochastic solution approach inspired from the behavior of tun...

Deep Convolution Neural Network Approach for Defect Inspection of Textured Surfaces

Meenakshi Garg[1], Gaurav Dhiman[2,]*

Corresponding Author:
Gaurav Dhiman

Affiliation(s):
1. Department of Computer Science, Government Bikram College of Commerce, Patiala 147004, Punjab, India
Email: meenagarg82@gmail.com
2. Department of Computer Science, Government Bikram College of Commerce, Patiala 147004, Punjab, India
Email: gdhiman0001@gmail.com
*Corresponding Author: Gaurav Dhiman, Email: gdhiman0001@gmail.com

Abstract:
Defect Inspection of Textured Surfaces is a challenging problem which occurs during manufacturing in many processing phases. With arbitrary length, shape and orientation, these defects occur. Moreover, there are fewer and different photos of defective products. Deep Convolution Neural Network (CNN) has an impressive development in target detection, and better results have been obtained with the implementation of deep CNN design for texture detection. Nonetheless, with the growing detection accuracy of deep CNNs, there are the drawbacks of significantly increasing computational costs and processing resources, which seriously hinders CNN's use in resource-limited environments such as mobile or embedded phones. In this paper, a novel framework is proposed that uses raw image database patch statistics joint with two layers of neural network for surface defect detection. For defect detection, a convolution neural network (CNN) classifier is used. Imaging analysis of training samples using Deep Convolution Neural Network (CNN) is used to find the defect in an image's target area. In point of energy saving, the results of the experiment show that proposed method has numerous advantages in terms of reduction in time and cost. It also shows the high-performance contrast to conventional manual inspection process with less repetition and helps to build the object detection classifier with high generalization potential and high detection accuracy.

Keywords:
Deep Convolution neural network (DCNN); Convolution neural network (CNN); Machine Vision; Defect detection; Fabric Defect Classification

Govt. Bikram College of Commerce, Patiala-147001 IQAC Punjab

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal,
Govt. Bikram College of Commerce, Pat

Criterion Incharge

Co-ordinator
NAAC
Govt. Bikram College of Commerce, Patiala.

Principal,
Govt. Bikram College of Commerce, Patiala

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-9 Issue-1, November 2019

BOSA: Binary Orientation Search Algorithm

Mohammad Dehghani, Zeinab Montazeri, Om Parkash Malik, Gaurav Dhiman, Vijay Kumar

Abstract: Optimization algorithms have many applications in solve the optimization problems in various sciences. The Orientation Search Algorithm (OSA) is an optimizer that is simulated the rules of a game called orientation game. In OSA searcher agent are players of orientation game that moves on the playground depending on the direction of the referee. in this study, binary model of OSA which called Binary Orientation Search Algorithm (BOSA) is proposed. BOSA and eight other algorithms (BGA, BPSO, BGSA, BGOA, BBA, BMOA, and BDA) are tested on twenty-three Benchmark test function. Proposed BOSA has a high ability to solve optimization problems compared to other algorithms according to the evaluation results

Genetic Algorithm (GA) and Differential Evolution (DI are most popular of these methods. Some of evolutionar based algorithms are: Evolution Strategy (ES Biogeography-based Optimizer (BBO), and Genet Programming (GP).

Swarm-based algorithms are kind of optimizati algorithm that inspired from the foraging behaviors insects, natural processes of plants, and social behaviors animals. Particle Swarm Optimization (PSO), is inspired t the social movement of the birds. Ant Colony Optimizati (ACO) is designed based on moving ants in order to sele

ESA: a hybrid bio-inspired metaheuristic optimization approach for engineering problems

Springer

January 2021 Engineering with Computers 37(3)
DOI: 10.1007/s00366-019-00826-w

Authors:

Read publisher preview

Download citation

Gaurav Dhiman
Government Bikram College of Commerce Patiala

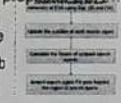
Citations (142) References (100) Figures (18)

Abstract and Figures

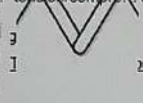
In this paper, a hybrid bio-inspired metaheuristic optimization approach namely emperor penguin and salp swarm algorithm (ESA) is proposed. This algorithm imitates the huddling and swarm behaviors of emperor penguin optimizer and salp swarm algorithm, respectively. The efficiency of the proposed ESA is evaluated using scalability analysis, convergence analysis, sensitivity analysis, and ANOVA test analysis on 53 benchmark test functions including classical and IEEE CEC-2017. The effectiveness of ESA is compared with well-known metaheuristics in terms of the optimal solution. The proposed ESA is also applied on six constrained and one unconstrained engineering problems to evaluate its robustness. The results reveal that ESA offers optimal solutions as compared to the other competitor algorithms.

Classification of population-bas...

Flowchart of the proposed ESA



Schematic view of exploration/compre...



Convergence analysis of ESA...

Schematic view of 25-bar truss...

Publisher Preview 1

Engineering with Computers (2021) 37:323–353
https://doi.org/10.1007/s00366-019-00826-w

ORIGINAL ARTICLE

ESA: a hybrid bio-inspired metaheuristic optimization approach for engineering problems

A hybrid fuzzy quantum time series and linear programming model: Special application on TAIEX index dataset

Pritpal Singh, Gaurav Dhiman, Sen Guo, Ritika Maini, Harsimran Kaur, Amandeep Kaur, Harmanpreet Kaur, Jaswinder Singh and Napinder Singh

https://doi.org/10.1142/S0217732319502018 | **Cited by:** 19

Previous Next

Abstract

The supremacy of quantum approach is able to provide the solutions which are not practically feasible on classical machines. This paper introduces a novel quantum model for time series data which depends on the appropriate length of intervals. In this study, the effects of these drawbacks are elaborately illustrated, and some significant measures to remove them are suggested, such as use of degree of membership along with mid-value of the interval. All these improvements signify the effective results in case of quantum time series, which are verified and validated with real-time datasets.

Keywords: Quantumtime serieslogical relationshipsintervals

PACS: 03.67.Ac

MOSHEPO: a hybrid multi-objective approach to solve economic load dispatch and micro grid problems

Gaurav Dhiman

Applied Intelligence **50**, 119–137 (2020)

8

DHIMAN: A novel algorithm for economic Dispatch problem based on optimization metHod usIng Monte Carlo simulation and Astrophysics coNcepts

Gaurav Dhiman, Pritpal Singh, Harsimran Kaur and Ritika Maini

https://doi.org/10.1142/S0217732319500329 | **Cited by:** 20

Previous Next

Abstract

This paper presents a new model using optimization approach for efficient prediction of load in real-life environment. Monte Carlo simulation and Schrödinger equations provide the effective number of solutions. This technique is useful in representation of relationships between different models. The proposed algorithm is verified and validated with various state-of-the-art approaches for solving economic load power dispatch problem to demonstrate its efficiency. Experimental results signify that the proposed algorithm is more precise than existing competing models.

Keywords: AstrophysicsQuantumSchrödingerMonte Carlo

PACS: 03.70.+k

KnRVEA: A hybrid evolutionary algorithm based on knee points and reference vector adaptation strategies for many-objective optimization

(6)

Gaurav Dhiman ✉ & Vijay Kumar

Applied Intelligence **49**, 2434–2460 (2019)

Engineering Applications of Artificial Intelligence
Volume 82, June 2019, Pages 148-174

5

STOA: A bio-inspired based optimization algorithm for industrial engineering problems ☆

Gaurav Dhiman, Amandeep Kaur

Show more

Share Cite

https://doi.org/10.1016/j.engappai.2019.03.021
Get rights and content

Abstract

This paper presents a bio-inspired algorithm called Sooty Tern Optimization Algorithm (STOA) for solving constrained industrial problems.The main inspiration of this algorithm is the migration and attacking behaviors of sea bird *sooty tern* in nature. These two steps are implemented and mathematically modeled to emphasize exploitation and exploration in a given search space. The proposed algorithm is compared with nine well-known bio-inspired algorithms over 44 benchmark test functions. The analysis of convergence behaviors and computational complexity of the proposed algorithm have been evaluated. Furthermore, to demonstrate its applicability it is then employed to solve six constrained industrial applications. The outcomes of experiment reveal that the proposed algorithm is able to solve challenging constrained problems and is very competitive compared with other optimization algorithms.

Introduction

Optimization is the process of defining the decision variables of a function to minimize or maximize its values (Dhiman and Kumar, 2018a). Most of the real world problems (Chandrawat et al., 2017, Singh and Dhiman, 2017, Kaur and Dhiman, 2019, Singh and Dhiman, 2018b, Singh et al., 2018b, Singh et al., 2018a, Kaur et al., 2018, Dhiman et al., 2018, Dhiman et al., 2019, Dhiman and Kumar, 2018) have high computational cost, non-linear constraints, non-convex, and huge amount of solution spaces and are complicated. Therefore, solving such problems with large number of variables and constraints is very tedious and complex (Spears et al., 2012). Secondly, there are many local optimum solutions that do not guarantee the best overall solution using classical numerical methods.

To overcome these problems, metaheuristic optimization algorithms (Dhiman and Kaur, 2019, Dhiman and Kumar, 2019b, Dhiman and Kaur, 2017) are introduced which are capable of solving such complex problems throughout course of iterations. Recently, researchers are gaining interest in developing metaheuristic algorithms (Dhiman and Kumar, 2018c, Singh and Dhiman, 2018a, Dhiman and Kaur, 2018, Dhiman and Kumar, 2018b, Dhiman and Kumar, 2019a) that are computationally inexpensive, flexible, and simple by nature. Metaheuristics are broadly classified into two categories namely single solution and population based algorithms. Algorithms based on a single solution are those in which a solution is generated randomly and improved until the best result is obtained. Population-based algorithms are those in which a set of solutions is randomly generated in a given search space and the solution values are updated during the iterations until the best solution is found.

However, algorithms based on a single solution can be trapped in local optima, thus not allowing the discovery of the global optimum. This is because, for a given problem, it reforms only one randomly generated solution. On the other hand, population based algorithms are able to find the global optimum. Due to this, researchers have been attracted towards population based algorithms nowadays.

The main motivation of population based algorithms is based on the theory of evolutionary algorithms, logical behavior of physics algorithms, swarm intelligence of particles, and biological behavior of bio-inspired algorithms. Evolutionary algorithms are inspired by the evolutionary processes such as reproduction, mutation, recombination, and selection. These algorithms are based on the survival fitness of candidate in a population (i.e., a set of solutions) for a given environment. The physics law based

Knowledge-Based Systems
Volume 165, 1 February 2019, Pages 169-

Online 1872 - 7409

Seagull optimization algorithm: Theory and its applications for large-scale industrial engineering problems

Gaurav Dhiman, Vijay Kumar

Show more

https://doi.org/10.1016/j.knosys.2018.11.024
Get rights and content

Abstract

This paper presents a novel bio-inspired algorithm called Seagull Optimization Algorithm (SOA) for solving computationally expensive problems. The main inspiration of this algorithm is the migration and attacking behaviors of a seagull in nature. These behaviors are mathematically modeled and implemented to emphasize exploration and exploitation in a given search space. The performance of SOA algorithm is compared with nine well-known metaheuristics on forty-four benchmark test functions. The analysis of computational complexity and convergence behaviors of the proposed algorithm have been evaluated. It is then employed to solve seven constrained real-life industrial applications to demonstrate its applicability. Experimental results reveal that the proposed algorithm is able to solve challenging large-scale constrained problems and is very competitive algorithm as compared with other optimization algorithms.

ISSN -

Volume 41 Issue : 1

ISSN : 0970-768

April 2019

PANCHBATI SANDESH

Interdisciplinary Research Journal

A BIANNUAL PUBLICATION

ਸਾਜਨ ਦੇਸਿ ਵਿਦੇਸੀਅੜੇ ਸਾਨੇਹੜੇ ਦੇਦੀ ॥

Dr. Balbir Singh Sahitya Kendra, Dehradun

PUNJABI UNIVERSITY, PATIALA (INDIA)

(Established under Punjab Act No. 35 of 1961)

CONTENTS

CONTENTS

Panchbati Sandesh (Interdisciplinary Research Journal)
Vol. 41 Issue I, April-2019 - 59-65

Farmer Suicides: Causes and Remedial Measures in Punjab

*Gazal Aggarwal** & *Dr. Narinder Kaur***
*Assistant Professor, Govt. Bikram College of Commerce, Patiala
**Professor, Govt. Bikram College of Commerce, Patiala.

Introduction

The state of Punjab located in North West India is surrounded by the Jammu & Kashmir in the North, the hilly state of Himachal Pradesh in the East and the State of Haryana and Rajasthan in the South. It covers geographical area of 50362 square kilometers.

The State of Punjab has been showcased as an Indian agricultural success story since the Green Revolution, which was the part of development initiatives undertaken by developed countries in the late 1960s & 1970s to aid developing countries in increasing their crop yield. Yet, since this time there has been a steady increase in the number of economically related suicides by Punjab farmers. During the Green Revolution, production was improved with the use of modified seeds that increased yield only when combined with expensive chemical, fertilizers & irrigation. Unable to afford sufficient amounts of these expensive inputs, small farmers found their holding becoming progressively less profitable. Meanwhile, grain prices remained comparatively low even as input costs increased. Now, three decades later, the small and marginal farmers of Punjab are trying to pursue environmentally and economically unsustainable agrarian practices, thus accumulating high debt while lacking alternative sources of income. Due to faulty agrarian policies, peasants of Punjab are reeling under heavy debt and are not in a position to repay the loans of commission agents, money lenders, land development banks, co-operative societies, commercial

Modern Physics Letters A
Vol. 34 (2019) 1950022 (24 pages)

DOI: 10.1142/S0217732319500226

Fuzzy-NN approach with statistical features for description and classification of efficient image retrieval

Meenakshi Garg*,‡, Harpal Singh† and Manisha Malhotra*
*University Institute of Computing, Chandigarh University, Mohali, Punjab, India
†Department of Electronics and Communication Engineering,
CEC Landran, Punjab, India
‡meenagarg82@gmail.com

Received 19 September 2018
Revised 3 November 2018
Accepted 12 November 2018
Published 11 January 2019

Image retrieval based on content not only relies heavily upon the type of descriptors, but on the steps taken further. This has been an extensively utilized methodology for finding and fetching out images from the big database of images. Nowadays, a number of methodologies have been organized to increase the CBIR performance. This has an ability to recover pictures relying upon their graphical information. In the proposed method, Neuro-Fuzzy classifier and Deep Neural Network classifier are used to classify the pictures from a given dataset. The proposed approach obtained the highest accuracy in terms of Precision, Recall, and F-measure. To show the efficiency and effectiveness of proposed approach, statistical testing is used in terms of standard deviation, skewness, and kurtosis. The results reveal that the proposed algorithm outperforms other approaches using low computational efforts.

Keywords: Image retrieval; fuzzy; Deep Neural Network; classifier.

PACS No.: 04.80.Cc

1. Introduction

Nowadays, everything is pooled on the web or social media platforms. Since Internet utilization is growing every day, also the databases size is increasing. Pictures have the ability to present data visually.[1] Thus, pictures are frequently distributed and saved on social-media platforms which results in a huge quantity of pictures' databases. Therefore, the databases of pictures must be maintained for effective retrieval, searching, and browsing.[2] For retrieving pictures, there should be a viable and powerful system. This is being given more attention to researchers nowadays.[3–20]

‡Corresponding author

International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 8 (2018) pp. 5766-5771

Statistical Feature Based Image Classification and Retrieval Using Trained Neural Classifiers

[1]Meenakshi Garg, [2]Manisha Malhotra and [3]Harpal Singh

[1]Research Scholar, [2]Associate Professor, [3]Professor
[1,2] University Institute of Computing, Chandigarh University, Mohali, India.
Electronics and Communication Engineering Department, CGC Landran, Punjab, India.
[1]meenagarg2000@yahoo.com

Abstract:

Content Based Image Retrieval (CBIR) has been one of the widely used approaches for sniffing & fetching out images from large image database. Nowadays, innumerous approaches have been staged to enhance the CBIR performance. The CBIR have a affinity to retrieve images depending on their graphical content. CBIR shuts down several issues which are linked with the existing ways of retrieving images by keywords. Most existing CBIR techniques are based on the images of color, text documents, informative charts, and shape. The work in this experiment have been performed using performance evaluation of the proposed method using COREL database with Deep Neural Network classifier for categorizing the images. The proposed approach here involves an efficient statistical feature extraction with 3 moments i.e. standard deviation, skewness & kurtosis and further classification of the images on the basis of these features using Deep Neural Network (DNN). The classifiers help categorize the images according to the data set. The precision values has been calculated and compared according to the retrieved images from the datasets and the results have been shown in graphical and tabular manner.

Keywords: Image retrieval, classifiers, ANN, feature extraction.

INTRODUCTION

In text-based retrieval, images are considered or indexed using keywords, subject titles or codes. The word "content" might refer to shapes, colors, textures, or some information which can be inherited from the picture itself. Thus, efforts are in the CBIR arena has started to involve manmade design which tried achieving the needs of consumer to perform the exact search. CBIR is important because founds that rely surely on metadata have dependent on fixed quality and completeness. These keywords become the norms to search and retrieve images. The space between the feature vector of the requested image and therefore the feature information is computed in terms of the distances. Future step is that the match exists. Text-based is not homogeneous system because different consumers use different keywords to search according to their awareness and understanding. The consumer can even offers the feedback whether or not the results are as expected and the mechanism is termed connectedness feedback. In off-line, the system extracts visual options like color, shape, texture, and abstraction info etc of every image within the info and stores them during a completely different info at intervals the system known as feature info. Kato to define the tests on image automatic retrieval from a database that centered on shapes and colors present. The word "content-based image retrieval" looks to have recognized in 1992, used by T. Finally, the system positions the images so returns the results that closely measure most, of like the requested image. In on-line retrieval, the consumer will submit a question example so as to retrieve the required pictures. A basic content-based image retrieval system is divided into off-line and on-line. The measure of the feature information is incredibly little as compared to the image data. This means the addition of these query methods are allow to queries, descriptive semantics, which may include consumer's feedback that can include systems or artificial learning that should be able to understand consumer's satisfaction level.

In a specific, picture regions are obtained by an object to be founded in an order to define the shape, and known segmentation methods combine with low-level color detection and region-growing of texture features or merge and split processes. texts or attributes in binary images or explicit margins of target objects in airborne or space images, etc.). CBIR uses two large clusters of contour or shape descriptors, namely, contour-based and region-based, signifying either an outer boundary (or contour) or an entire region. In the region based approaches, all pixels came with shape, which are achieved into account to attain the representation of shape. Color is that the feature that makes the thing identification method terribly straightforward and is stable in contrast to direction variations, dimension of image and background complexness. The common region techniques use the moment definer to define the shape. The color house is employed for the specification of the colors. The object's shape performs a critical role in retrieving for alike objects (e.g. To extract the color possibilities from the content of a picture, a correct color house and a good color descriptor need to be determined. It is seen in world that humans usually distinguish things supported their color. This can be the rationale that color is usually wont to differentiate pictures in content-based image retrieval. After dividing the objects, their contours have to be defined, indexed, and matched. There square measure numerous color areas developed like RGB, HSV, CIE L*a*b for completely various needs and different functions. Shape from an image is quite a powerful representation as it characterizes the geometry of the object.