The Second International Conference on Distributed Computing and High Performance Computing (DCHPC 2022), 2nd-3rd March 2022, Qom, Iran.

Abstract Book

DCHPC 2022

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2nd-3rd March 2022, Qom, Iran

Editors:

Shamsollah Ghanbari
Maryam Khosrokhani
Debasish Ghose

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The Second International Conference on Distributed Computing and High Performance Computing (DCHPC2022), 2nd-3rd March 2022, Qom, Iran.

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Qom, Iran.

Conference Program

Wednesday, March 2, 2022

Session Link:

Time (Tehran Time)*	Event	Venue
08:30-10:15	Opening	Main Hall
10:15-10:30	Break	■
10:30-12:00	Main Speaker Prof. Maciej Drozdowski	Main Hall
12:00-13:00	Lunch	■
13:00-14:40	Online Parallel Sessions	■
14:40-14:50	Break	■
14:50-16:10	Keynote Speaker Prof. Bharadwaj Veeravalli	Main Hall
16:10-16:20	Break	■
16:20- 17:20	Workshop: Dr. Hoshang Kolivand Current and Future of Directions of Augmented and Virtual Reality	Main Hall
17:20-18:20	Workshop: Eng. Niladri Mahapatra Agile Transformer, Training, and Coaching	Main Hall

Thursday, March 3, 2022

Session Link:

Time (Tehran Time)*	Event	Venue
08:30-10:30	Online Parallel Session	■
10:30-10:45	Break	■
10:45-12:00	Keynote Speaker Prof. Ali Emrouznejad	Main Hall
12:00-13:00	Lunch	■
13:00-14:00	Workshop: Dr. Abdalsamad Keramatfar Introduction to Graph Neural Networks and its applications	■
14:00-15:00	Workshop: Dr. Aamar Wali Cellular Automata Learning and Prediction Model for Handwritten Pattern Recognition	■
15:00-15:15	Break	■
15:15-16:05	Keynote Speaker Prof. Zuriati Ahmad Zukarnain	Main Hall
16:05-16:55	Workshop: Dr. Mahboobeh Shamsi Software Requirements and Testing	■
16:55-17:30	Closing	■

Note: Tehran, Iran time is 3:30 hours ahead Greenwich Mean Time (GMT).

About DCHPC2022

Conference Program & Scientific Chair : Shamsollah Ghanbari

The Second International Biennial Conference on Distributed Computing and High-Performance Computing (DCHPC 2022) was organized jointly by the Informatics Society of Iran (DCS scientific group) and Qom University of Technology. The DCHPC2022 conference was technically supported by IEEE Iran Section and Islamic World Science Citation Center (ISC). The organizing committee has gone a great length to plan the event.

One of the most important purposes of the DCHPC conference series is to bring together the researchers from industry, academia, and other institutes to share and discuss their latest scientific findings in high performance computing, distributed systems and applications.

In this conference, we received 115 submissions from 200 authors. Those submissions were from 11 countries including Iran, Iraq, Pakistan, India, Malaysia, Hungary, Poland, Russia, Kazakhstan, United States, and Tunisia. We assigned the papers to 50 expert committee members and about 20 sub-reviewers. In fact, for each paper we received 2-3 reviews. We directly selected and accepted a set of 19 papers for publication in IEEE and 15 other papers for ISC after discussion with the academic committee. We also accepted 8 Persian papers for oral presentation.

Therefore, in this conference 42 papers were presented in 9 parallel sessions. We also invited four distinguished keynote speakers and five workshop presenters.

I would like to strongly admire all participants of the conference. Special thanks go to the main speaker, keynote speakers, and workshop presenters for their warm cooperation. I would also like to appreciate the committee members and sub-reviewers, and the session chairs who helped us to review the papers, make the decision, and handle the parallel sessions.

I appreciate the great efforts that the authors have made to this conference and congratulate the authors of the accepted papers.

It is also my honor to sincerely appreciate the sponsors and the organizing committee including the general chair program committee co-chairs, executive chair, and publication chair. I would also like to appreciate my other colleagues and some of my students and friends that kindly helped me to organize this event.

Keynote Speakers

Prof. Maciej Drozdowski
Professor of Computer Science
The Poznan University of Technology, Poland

Maciej Drozdowski received MSc in control engineering in 1987, and a PhD in computer science in 1992. He was a post-doc in Memorial University of Newfoundland in Canada. Currently he is an associate professor in the Institute of Computing Science, Poznan university of Technology in Poland. His research interests include design and analysis of algorithms, combinatorial optimization, scheduling (esp. in parallel computer systems), computer performance evaluation, operations research, web engineering. He is a a senior member of IEEE.

Title: Divisible load theory – from basics to applications

Abstract
Divisible load theory (DLT) represents parallel computations which can be divided into parts of arbitrary sizes processed in parallel. These assumptions allowed to formulate a scheduling and performance model for data-parallel computations. In this presentation divisible load theory will be introduced. Application of DLT in MapReduce computations will be presented. DLT in modeling parallel computations by use of isoefficiency maps and in scheduling heterogeneous systems for minimum time and energy will be discussed.

Keynote speakers

Prof. Bharadwaj Veeravalli
Department of Electrical & Computer Engineering Faculty of Engineeing
National University of Singapore

Bharadwaj Veeravalli, Senior Member, IEEE & IEEE-CS, received the BSc degree in physics, from Madurai-Kamaraj University, India, in 1987, the Master's degree in Electrical Communication Engineering from the Indian Institute of Science(IISc), Bangalore, India in 1991, and the PhD degree from the Department of Aerospace Engineering, Indian Institute of Science, Bangalore, India, in 1994. He received gold medals for his bachelor degree overall performance and for an outstanding PhD thesis (IISc, Bangalore India) in the years 1987 and 1994, respectively. He is currently with the Department of Electrical and Computer Engineering, Communications and Information Engineering (CIE) division, at The National University of Singapore, Singapore, as a tenured Associate Professor. His main stream research interests include Cloud/Grid/Cluster computing (big data processing, analytics usign Deep Learing techniques and resource allocation), Scheduling in parallel and distributed systems, Cybersecurity (use fo machine learing and FHE techniques), and Multimedia computing. He is one of the earliest researchers in the field of Divisible Load Theory (DLT). He is currently serving the editorial board of IEEE Transactions on Parallel & Distributed Systems as an Associate Editor. He is a senior member of the IEEE and the IEEE-CS. He can be contacted via: elebv@nus.edu.sg

Title: HANDLING PARTITIONABLE WORKLOADS ON NETWORKED COMPUTE SYSTEMS: Is the future bleak or bright for Divisible Load Models?

Abstract
Rapid mounting of applications and data processing services on network-based compute platforms such as Clouds, HPC Clusters, etc, have gained considerable attention in recent years. Modern day design of smart application clients, be on mobile or stationary computing systems, attempt to fully leverage on virtualizaiton and auto-scaling with flexible resource management abilities on a Cloud platform. Support for scientific and non-scientific applications on such platforms already attempted to use off-the-shelf solutions for a variety of applications in the domain of scientific computations, financial, government data, and medical, to quote a few. To address large volume data handling, Divisible Load (scheduling) Theory (DLT) approaches have been in place over 3 decades since its inception in 1988. Although the theory offers immense advantage in eliciting several underlying limits of performances and valuable results on resource management, a key question at this juncture is to address if this theory would remain successful in the race amidst off-the-shelf solutions offered by current day compute platforms and also if it would remain competitive to the modern day solutions. I believe we are at a crucial phase of development of DLT to validate and examine its future and identify any new challenges it needs to confront. In this talk, I will attempt to highlight certain gaps and certain sparsely used or forgotten issues in this domain and address a key question on how well modern day compute platforms accommodate DLT. I will also point to two possible "spaces" where DLT could continue to live in and share my recent experiences in one of these domains. I will conclude this talk by addressing the key question in the title with a few imperative take-away points.

Keynote Speakers

Prof. Ali Emrouznejad
Professor and Chair in Business Analytics
Aston Business School, Aston University, United Kingdom
Email: a.emrouznejad@aston.ac.uk

Ali Emrouznejad is a Professor and Chair in Business Analytics, UK. His areas of research interest include performance measurement and management, efficiency and productivity analysis as well as data mining and big data. He holds an MSc in applied mathematics from Ferdowsi University of Mashhad, and received his PhD in operational research and systems from Warwick Business School, UK. Having got PhD in the area of Data Envelopment Analysis, in 1998, he has joined to the development team of Performance Indicators (PI) in Higher Education (HE) at HEFCE (Higher Education Funding Council for England). The PI in HE has been widely published and it is now an annual publication of HESA (Higher Education Statistical Agency). He has also collaborated on research project titled "assessing cost efficiencies in higher education" funded by the Department for Education and Skills (DfES). His most research project is on "Analysis of efficiencies and productivity evolution in manufacturing industries with CO2 emissions" funded by Royal Academy of Engineering.
Dr Emrouznejad is Editor, Associate Editor or Guest Editor in several journals including Annals of Operations Research, European Journal of Operational Research and Journal of Operational Research Society. He has published over 200 articles in top ranked journals, he is also author / editor of several books including:

- "Big Data and Blockchain for Service Operations Management" (Springer),
- "Big Data for the Greater Good" (Springer),
- "Big Data Optimization" (Springer),
- "Applied Operational Research with SAS" (CRC Taylor & Francis),
- "Performance Measurement with Fuzzy Data Envelopment Analysis" (Springer),
- "Managing Service Productivity" (Springer),
- "Fuzzy Analytics Hierarchy Process" (CRC Taylor & Francis), and
- "Handbook of Research on Strategic Performance Management and Measurement" (IGI Global).

Title: Big Data for Service Operations Management

Abstract
Big Data is a major source of change in today's world. It is without doubt a source of immense economic and social value with the potential to impact individuals, organizations, and society alike in ways that are yet to be fully explored. Organizations are constantly collecting a variety of data, such as standard tables, text, pictures, and videos, of unprecedented sizes (millions or billions of records / variables) and from various sources, with the aim to use such data to improve their operations / services and create competitive advantage. There is a collective assumption that if organizations can learn to harness Big Data, then their operational capabilities would be transformed to be more efficient. On the other hand, in the large and complex organizations, performance management includes activities which ensure that goals are consistently being met in an effective and efficient manner. Traditional performance management has proven to be insufficient to assess organizations as it focuses on one specific angle only. In the era of big data, organizations can be assessed from

different perspectives and so a more complicated performance measurement system is necessary. This talk aims introduce some novel applications of big data in service operations for both academics and interested practitioners, and to benefit society, industry, academia, and government.

Keynote speakers

Prof. Zuriati Ahmad Zukarnain
Department of Communication Technology and Network, Faculty of Computer Science and Information Technology, University Putra Malaysia, 43400 Seri Kembangan, Serdang, Selangor, Malaysia;
zuriati@upm.edu.my

Zuriati Ahmad Zukarnain has received her Doctor of Philosophy in the area of Quantum Computing from University of Bradford, UK in the year 2006. She has been appointed as the head of department for the department of Communication Technology and Networks from 2006 until 2011. She became an Associate Professor in 2011 and a full professor in the year 2017. She has been appointed as the deputy dean of the Faculty of Computer Science and Information Technology in the year 2017. Subsequently, she has been appointed as the deputy dean of School of Graduate Studies UPM in the year 2019.
Zuriati has pursued in depth research in the area of Quantum Communication and Wireless Networks. She has carried out her research work including the Authentication Multi photon over secured direct communication, Authentication of Single photon for multi party Quantum Key Distribution Protocols, Quantum Key Distribution for Quantum Cryptography and Quantum Communication, Cashless Payment System using Blockchain Technology, Quantum Processor Unit for Quantum Computers and Intra-domain Mobility Handling Scheme for Wireless Networks. Her research has been given recognition in its significance and impact with her publications in high impact journals. She has successfully completed 12 Phd students and 2 Master students by research encompassing both local and international students. Most of the research conducted are supported by Ministry of Higher Education(MOHE) and Ministry of Science, Technology and Innovation(MOSTI). She managed to extend her Science fund project into the Prototype Research Grant Project(PRGS). The research involved a basic setup Quantum experiment which aims to produce a software designing tool for Quantum Communications known as the Quantum Communication Simulator(QuCS). Apart from doing research, she has also involved as a member of the editorial board of several international peer-reviewed and cited journals.
At the international level, Zuriati has been awarded as the Distinguished Woman In Computer Science award at the 4th Venus International Women Awards(VIWA), 2019. More importantly the software, QuCS that she developed won a gold award and a special award at the 2016 International Invention Innovation, Canada. Zuriati also won the outstanding World Woman Scientist Grand Award at the 3rd World Scientist Awards (WSA) 2016 in Seoul, South Korea. She also won an 'Innovative Inventor Grand Award' for 'Order of Merit: Information Technology' at the 5th World Inventor Award Festival (WIAF) 2016. Recently, Zuriati has developed a blockchain-based cashless payment system, known as 'Zchain4U' that could be a solution to secure the online transactions in Malaysia. This new technology is in line with the Industrial Revolution 4.0 as the growing demand for cyptocurrencies such as Bitcoin has attracted many scammers who attempt to defraud users through e-wallet offerings or take advantage of them in other ways. Additionally, unsecured ewallets can also be easily hacked and blockchain technology can provide better security than that provided for traditional transactions. At the same time, Zuriati has produced a book entitled 'Bitcoin' that

was published on March 2018. It is kind of pleasure for her to get close to the society. She actively conducts various talks and workshops to educate people on cyber security threats and cyber security awareness in the society. She has been invited to be on broadcast life by TV3, TV9, Bernama TV and Astro Awani, the television broadcast stations in Malaysia. Zuriati believed that the significance findings of research may connect the researcher and the society to new knowledge in the field. Futhermore being as an inspired research scholars or academics will be able to expose the society to new ideas, discoveries and knowledge through first-hand experience.

Title: A State of Art Quantum Key Distribution for 5G Networks

Abstract

In recent years, 5G networks and services become progressively popular among telecommunication providers. Simultaneously, the growth in the usage and deployment of smartphone platforms and mobile applications has been seen as phenomenal. Thus, it is a must to explore the current state of the art of 5G technology in the merger of unconditional security requirements referred to as Quantum Cryptography. The various domain of Quantum Cryptography is including the protocols available, their functionality and previous implementation in real networks. Therefore it is important to identify the critical aspects of how Quantum Cryptography can be realized and effectively utilized in 5G networks. These include improving the current technique in Quantum Cryptography through efficient key distribution and message sharing between users in 5G networks.

Keywords: Quantum communication, QSDC, QKD, 5G

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Workshop Title	Presenter
1-Current and Future of Directions of Augmented and Virtual Reality	Hoshang Kolivand
2-Introduction to Graph Neural Networks and its Applications	Abdalsamad Keramatfar
3-Agile Transformer, Training and Coaching	Niladri Mahapatra
4-Cellular Automata Learning and Prediction Model for Handwritten Pattern Recognition	Aamar Wali
5-Software Requirements and Testing	Mahboubeh Shamsi

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Accepted Papers for IEEE

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Mining Frequent Spatial Patterns in Image Databases with 17D-SPA Representation

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Keywords
Frequent image patterns
Data mining
Image mining

Abstract
In this paper, we propose a new algorithm for mining frequent patterns in image databases. Our method mines patterns with more accuracy than a previously known algorithm and can be beneficial, where small differences in object locations can change the pattern. In this regard, we generate larger patterns from smaller ones and check whether the support for each candidate is less than a user-specified amount.

Conclusion

In this paper, we proposed a new algorithm to mine frequent spatial patterns found in image databases. We also introduced a new method for pruning impossible patters. This pruning phase gives the algorithm an advantage over Apriori since no longer is needed to search the database for most patterns. Our mining method processes more neighboring areas compared to 9D-SPA. This allows the algorithm to mine with more accuracy and to perform better when the patterns in images are more sensitive to object locations. Similar to other spatial mining algorithms, 17D-SPA can be used in real world applications where spatial relations can be helpful such as medical images, geographic information system (GIS) and architecture images.

Accepted Papers for IEEE

Stock Price Prediction using Intelligent Models, Ensemble Learning and Feature Selection

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Keywords
Ensemble Learning
Real Time Model
Prediction of Stock Price
Evolutionary Computing
Artificial Neural Networks

Abstract
The use of artificial intelligence-based models have shown that the stock market is predictable despite its uncertainty and unstable nature. The most important challenge of the proposed models in the stock market is the accuracy of the results and increasing the forecasting efficiency. To overcome this challenge, this paper employs ensemble learning (EL) model using intelligence-based learners and metaheuristic optimization methods to maximize the improvement of forecasting performance. The multiplicity of inputs in the prediction model reduces the speed of execution and increases complexity. The proposed model, with feature selection, increases the accuracy and use as a real-time model. Genetic algorithm (GA) and particle swarm optimization (PSO) technique are used to optimize the aggregation results of the base learners. The evaluation results of stock market dataset show that the proposed model can overcome the market fluctuations and can be used as a reliable model.

Conclusion

High-accuracy stock price prediction for trading is highly important in this market, which leads to the preservation and increase of capital. Considering the fact that some of the classic financial theories find market unpredictable, in this paper, despite fluctuating and unstable nature of the stock market, using artificial intelligence models, predicting the behavior of stock markets has shown that it is possible to predict the market. The proposed model employed ensemble learning (EL) to increase the accuracy of prediction and rendered higher evaluation in criteria. The proposed model can be applied in a real trading system and implemented on several datasets. The results showed that the proposed model, compared to other models, had more desirable performance. According to the results, the model proposed can be utilized as a backup system of certain decision-making in real trading in the stock market. It would be interesting to consider the following issues as future streams:
1. Employing other powerful meta-heuristic methods such as Ant Colony Optimization (ACO) to aggregate the results of the base models.
2. Simulating the results of the models in a practical way, considering transaction costs.

Accepted Papers for IEEE

Real Time Supply Chain Performance Management: An IoT-Based Framework for Continuous Improvement

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Keywords

IoT
Performance Management
SCOR
Real Time Decision Making
Continuous Improvement

Abstract

The aim of this paper is to develop a real-time decision alignment based on Internet of Things (IoT). This paper presents a dynamic framework for supply chain performance management (SCPM) by adaptive approach. First, improving the SCPM by aligning different levels of decision making in an integrated process of transform strategies into action plans. Second, improving the SCPM by using feedback-based decision making. The proposed framework is based on change detection, event-driven planning and dynamic decision alignment. In this study, decisions are categorized into two levels, namely, a decision-making based process and decision support system (DSS) based decisions due to their nature. By using supply chain operations reference (SCOR) model, all of the metrics would be integrated. To develop this framework, we employ the concepts of supply chain management, SCPM, strategic design approach, multi objective techniques and SCOR.

Conclusion

This study presents a comprehensive framework for continuous SC performance improvement using a dynamic alignment of strategic and operational decisions. As a result, the proposed framework provides the following features and capabilities.

- Considering qualitative and quantitative parameters of planning simultaneously.
- Being dynamic, adaptive, and acting based on the latest events, which lead to continuous improvement.
- Integrity and alignment of decisions with the below details.

For effective and efficient SC management, decisions must be aligned in three dimensions (Fig. 5): However, based on the capabilities of the proposed framework, the following future developments are encouraged.

- The proposed framework can be developed on the web as an online SC and a real time DSS. It accelerates the optimization process and provides facilities for optimizing. In addition, it improves the ability to share information that is the basis for an effective performance management. As a result, the inconsistency between decisions at different levels is reduced.
- How to predict the new trend of the manufacturing system according to the real-time production performance information?

Accepted Papers for IEEE

A Collocation Method for the Numerical Solution of a Class of Linear Stochastic Integral Equations Based on Legendre Polynomials

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Keywords
Stochastic Integral Equations
Collocation Method
Numerical Solution
Legendre Polynomials

Abstract
In this paper, a collocation method will introduce. This method is applied to obtain the numerical solution of a class of linear stochastic integral equations. For this purpose, the integrals of these equations are expressed in terms of Legendre polynomials. Then they are applied to the stochastic integral equation and calculate the obtained equations at the node points, where results in a linear system that will solve by conventional methods. Finally, to evaluate the effectiveness of the proposed method, an example is provided, and the numerical results are analyzed.

Conclusion

Because it is not possible or is difficult to obtain the analytical solution of stochastic integral equations, researchers are interested in finding an appropriate approximation of the analytical solution of these equations. So far, for this purpose, scientists have introduced various numerical methods. Some of these methods approximated the analytical solution of various stochastic integral equations with types of polynomials. In this paper, first, Legendre polynomials are introduced, then a method for solving stochastic integral equations based on these polynomials is introduced. Then the method was applied to an example, and the obtained results were recorded and compared in the tables. Analysis of the results shows that when the maximum degree of Legendre polynomial increases, the approximation of the solution is more accurate.

Accepted Papers for IEEE

Comparative Survey on the Ways of Access to Managerial Information

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Keywords
Managerial Information
Information Access
Academic Libraries
Library Management
Information-Seeking Behavior
Managers

Abstract
The main objective of the paper was a comparative investigation of acquiring management data by the managers of the Tehran Universities Central Library (TUCL). The comparative survey method is used in the current study and to collect data, researcher-made questionnaires were employed. The data were analyzed in two levels using Minitab software. Findings of the research suggested that middle managers mainly preferred to utilize the workers' reports and operational managers used the internet as their informational resources. Regarding applying the information both preferred planning most and authoring and research, least. Middle managers and operational managers' main priority to get information was to contact experts and surf on the internet, respectively and their last priority was using the personal library. Regarding communication methods, both groups mainly preferred phone most and attending conferences last. In addition to guiding information science experts, the results of the current study can give insights to the designers and experts of the management information systems (MISs) in designing user-friendly systems.

Conclusion

The findings showed that there are differences in middle and operational managers' perspectives of priorities. Middle managers mostly rely on inspecting divisions and getting reports from workers, whereas operational managers are interested in searching the internet and databases. Regarding the application of the information in different managerial levels, research findings suggest that there is no significant difference between these two groups, except for the two items of "monitoring and control" and "Carrying out current issues", and in both cases, middle managers' priority is significantly higher. Regarding using different methods to acquire information by the managers in middle and operational levels, findings indicate a significant difference among most of the items. Middle managers' main priority to acquire information is consulting with colleagues, whereas operational managers' main priority was to search on the internet. Regarding the usage of different communication methods, findings indicate a similarity between these two groups. Both groups' usage priority includes Phone calls, face-to-face communication, email, virtual networks, and finally attending conferences.

Accepted Papers for IEEE

A Light Weight Deep Learning Model for Real World Plant Identification

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Keywords
Deep Learning
Plant Classification
Convolutional Neural Network (CNN)
Resnet-50

Abstract
Automatic identification and classification of different real plant leaf species have become a common trend among researchers and scientists. In the present study for the classification of leaves, we have created a model for plant leaf classification based on a dataset we collected. We've used the Resnet-50 model, a well-known CNN architecture, which provided an efficient method to organize and analyze a deep classification to reduce the complexity so that there will be fewer parameters for training and low time consumption as well. The convolutional neural network is famous for its influential abilities in feature extraction and classification. And Resnet-50 being a residual network enabled us to train deep networks in our model. The average training accuracy reached 98.3%, while the average testing accuracy reached 92.5%. Data Availability : https://drive.google.com/file/d/1bD7B257l-6wqUCQHBWhle95xyrotUbwO/view?usp=sharing

Conclusion

In this paper, we proposed a method for the classification of plant leaves (Manually Prepared Dataset). The dataset contained 3 plant species i.e. Grapes, Mango, and potatoes. The experimental results pointed out the probability of the proposed method by obtaining the training accuracy of 98.3% and 92.5% of testing accuracy.
We will consider more species of plants in future study not just limited for identification, also we will consider disease of plants as well as identification.

Accepted Papers for IEEE

An Image Retrieval Approach Based on Feature Extraction and Self-Supervised Learning

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Keywords
Image Retrieval
Feature Extraction
Self-Supervised Learning
Frequent Pattern Mining

Abstract

Today, due to the development of technology and the advent of web 2.0 applications, different users prefer to do many of their personal tasks over the Internet. Due to the huge amount of information on the web, retrieving the appropriate information for each user has become a challenging task. Content-based image retrieval is one of the most important research fields in digital image processing domain, which searches the similar images to the target image by extracting visual content from the query image. In this regard, many studies have been conducted to increase the accuracy of image retrieval systems. However, due to the explosive growth of storage resources and the lack of a responsible system for image retrieval, it is still considered as one of the most attractive fields of research. In this paper, a method is proposed that extracts the appropriate features using a hybrid method, and then searches the images that are similar to the target image. In this way, self-supervised learning approach is utilized to provide the most similar images. Experimental results based on the Corel dataset show that the accuracy of the proposed method has increased compared to the other methods.

Conclusion

With the growth and development of the digital world and increasing storage of information and images in databases, access to information and images by users is became to the outstanding issues. In such situations, image retrieval systems were created to retrieve and provide proper images to users. CBIR methods are able to extract the similar and related images in terms of content of an image database by using a set of features that are automatically extracted from images. Recent studies in the field of CBIR have been conducted in order to reduce the semantic gap between low-level visual features of images and high-level semantics of the images. To deal with this problem in this paper, the combination of wavelet transform and color histogram was used to extract the features. The purpose of this paper is the use of data mining methods to provide a system to recommend the similar and accurate images with the target image. For this aim, clustering, frequent pattern mining, association rules and classification as data mining methods were used. The test results showed that although using the classification of multilayer perceptron neural network relatively spends high time to construct a classification model compared to other methods in image recommender and in online phase, it has the highest precision and recall compared with other algorithms. Compared to other image recommender systems, precision rate has improved 0.13% in the proposed system as well.

Accepted Papers for IEEE

Detecting IoT Attacks using Multi-Layer Data Through Machine Learning

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Keywords
IoT
Internet
Artificial Intelligence
Machine Learning
pcap
Datagram
Network Traffic
Packet
Malware
Malicious
Benign

Abstract
Internet of Things (IoT) devices is being used in countless network applications. However, due to their insecure nature, the wide adoption of these devices has also increased the possibility of cyber-attacks. There is a need for a robust security mechanism to detect and safeguard against numerous threats. Machine Learning (ML) techniques have been used to detect attacks on different networking layers but training only the network, transport, or link-layer data has proven to be inadequate. Thus, opening paths for attackers to take control and penetrate the networks. Leveraging from this inadequacy, we have employed Machine Learning technology to detect attacks on IoT devices using the application, transport, and network layer data. In particular, we have focused on feature extraction of Application layer data to identify nefariousness in packets. Furthermore, for packet classification, we are also extracting features from the network layer and transport layer. Our simulation results have promised accuracy of 88% and 92% using different ML algorithms. We have also identified possible future work that can be used to validate the solution.

Conclusion

Malicious attacks that target IoT devices are very challenging issues. The existing security mechanisms are not able to properly understand attacks due to the encapsulation of attack data at different network layers. The research presented in this paper makes use of machine learning to learn features of application, transport and network-level data to identify attacks on IoT end-systems. Although it may not be feasible to implement this detection system on individual IoT nodes, our simulation proves that an intermediate node in the network is able to execute all required functionalities for a smooth traffic flow.

Accepted Papers for IEEE

A Hybrid Collaborative Filtering Technique for Web Service Recommendation using Contextual Attributes of Web Services

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Keywords
Quality of Service
Collaborative Filtering
Service Oriented Architecture

Abstract
Quality of Service (QoS) Aware recommender system considers the quality of service to recommend personalized web services to the user. Quality of Service parameters also includes response time and throughput that a user receives when invoking a web service. There exist numerous collaborative filtering techniques that tend to predict Quality of Service value; however, existing techniques only use the client-side information of QoS and neglect the service's contextual attributes. This paper proposes a new Web Service Recommendation System that will consider the contextual attributes of Web services. The proposed method collects the contextual properties from WSDL files to cluster Web services based on their attribute similarities. Thus, more accurate neighbor selection takes place and prediction value is determined using QoS record; in addition to this, a user-influenced prediction value is also determined. To map both, service, and user influence on QoS prediction, a hybrid memory based CF model is developed. The effectiveness and reliability of the proposed system is verified by the results of experiments.

Conclusion

A new hybrid Web services recommendation system using memory-based CF methods is proposed in this paper. The contextual attributes of Web services are incorporated in existing approaches to obtain better accuracy. To show the effectiveness and reliability of the system proposed, adequate experiments on real-world datasets were performed. In the proposed approach, users neighborhood is identified using PCC, which may not be accurate enough in case of the sparse matrix. Hence in the future users' geographical and network location for neighborhood identification will be considered. Web service's contextual attributes are not just limited to content, type, and name. It is believed that other contextual attributes will also shed some more light on Web services neighborhood identification. The identification of more contextual information is currently under research.

Accepted Papers for IEEE

Impact of Artificial Intelligence in COVID-19 Pandemic: A Comprehensive Review

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Keywords

Novel Coronavirus (COVID-19)
Computer Science (CS)
Machine Learning (ML)
Data Science (DS)
Artificial Intelligence (AI)
Deep Learning (DL)
Pandemic

Abstract

The goals of a health-care system are, to provide effective treatment with minimum cost and risk factors, delivery of medical services on time, and be ready to counter any emergency situation. To achieve these goals, a health-care system must be well prepared. The preparation is depending upon data, and the data scientists to analyze that data. Artificial Intelligence (AI) introduced a novelty in health-care, with its different tools which are built upon Machine Learning (ML) and Deep Learning (DL) algorithms. Besides clinical procedures and treatments, these algorithms are used for analyzing data and provides help in decision making. Similarly, to tackle this pandemic Novel Coronavirus disease 2019 (COVID-19) the computer scientists played their role individually and with the help of biological scientists to provide the solutions related to risk management (How much this pandemic can spread and affect the people), diagnosis of this disease with minimum time and cost, making vaccine and, suggesting that which medical treatment should adopt.

Conclusion

COVID-19 is a pandemic and affected the whole word in very little time. Due to the rapid increment of the patients of COVID-19, the hospitals become overcrowded. It would be worse if the computer scientist did not play their role. Risk management is a key point to tackle such a situation, and for managing the risk and risk assessment is an important factor. Subfields of computer science are helping to not only risk management but also disease detection as well as vaccine development. The purpose of this study is to, gather the efforts made my computer scientist yet, for providing the solution to handle this pandemic. We have discussed what are the shortcomings, reasons for that, and what are the new challenges for those researchers who want to put their efforts into this area of research. This study motivates those who want to utilize their skills related to any subfield of computer science to address such a situation. The situation in which data is not complete, and too much dynamic in nature.

Accepted Papers for IEEE

Optimized Power Consumption Formula for Designing IoT-Based Systems

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Keywords
IoT
Power Consumption
Low-power
Sleep Mode
Smart Home

Abstract
Smart homes are currently being empowered by Internet of Things (IoT) innovations and applications. IoT-based systems are designed to achieve low power consumption and optimal performance. In many situations, IoT devices are powered by batteries, and power efficiency is the most crucial need for them to operate reliably for long periods of time. Low power consumption and increasing system lifetime are two important problems of IoT. This paper describes a formula for designing IoT systems depending on the available power of the resource. This paper presents an effective technique to reduce power consumption. The proposed method is based on the available power in the resources of an IoT system. First, the power consumption is calculated to meet the system's requirements, and then the system is developed appropriately. Furthermore, by constructing a smart home system, the quantity of power storage in a specific situation is investigated, and a formula for designing IoT systems based on the available power has been presented.

Conclusion

In this paper, by designing an IoT system (smart home) and measuring power consumption of the system, a method and formula were obtained to design IoT systems based on available power consumption. In other work, most of the attempts are made to optimize power consumption, and in most methods, power consumption optimization is associated with fundamental changes in the system, and these techniques can be very costly. Most of these techniques are designed for specific applications, and their implementation in other projects may not be cost-effective. A method that can provide a way to design a system based on our available power can be used in all projects and is cost-effective, and this method is described in this paper. In this paper, a formula is proposed, which the system can be designed based on the required power consumption.

Accepted Papers for IEEE

Optimization of Modified Adaptive Neuro-Fuzzy Inference System (MANFIS) with Artificial Bee Colony (ABC) Algorithm for Classification of Bone Cancer

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Keywords

Bone Cancer
Fuzzy C-mean Clustering
Feature Extraction
MRI
ANFIS
Artificial Bee Colony Algorithm
Meta-Heuristic Algorithms

Abstract

Bone cancer is the uneven progress of tissue in the bone. This illness can be primary or secondary. Primary bone sarcoma grows from the cells of the bone, while secondary bone cancer begins from different body organs and then extends to the bone cells. The cure of fillet cancer depends on tumor localization, size, and other factors. Therefore, initial recognition and category of bone cancer have become required to therapy the patient. In this procedure, a technique proposed for the glory of bone cancer employing fuzzy C-mean clustering also uses Modified Adaptive Neuro-Fuzzy Inference System (MANFIS) with Artificial Bee Colony algorithm to classify benign and malignant bone cancer. The experiments illustrate that the suggested method has a high accuracy of 96.67% and offers enhanced productivity than the systems in bone MR images.

Conclusion

Bone cancer is often misdiagnosed because radiologists have difficulty interpreting skeletal pictures. Image processing procedures can provide precise mechanisms for skeletal imaging and support radiology sets in diagnosing bone cancer. There are various classification methods used for classification problems. MANFIS is a fuzzy neural-based classifier that means the collection of fuzzy logic and neural networks so that the parameters of fuzzy systems can be detected with the help of neural networks. This article is a designed system that can diagnose and classify tumors in MRI images. An adaptive neural and fuzzy inference system based on the Renborn honey colony has been assumed to analyze and categorize bone cancer. The investigational results show that the category scheme is 96.67% more effective and offers enhanced presentation than the procedures in bone MR imaging.

In the future, this scheme can be used not only to classify benign and malignant tumors but again for diverse forms of bone tumors such as Crodoma, Enchondroma, and Ewing sarcoma. Other optimization algorithms can also be used for the proposed method.

Accepted Papers for IEEE

Hybrid Genetic-Environmental Adaptation Algorithm to Improve Parameters of COCOMO for Software Cost Estimation

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Keywords

Software Cost Estimation(SCE)
Genetic Algorithm (GA)
Environment Adaptation (EA) Algorithm
Constructive Cost Model (COCOMO)

Abstract

I The software cost estimation (SCE) problem is one of the major challenges in software engineering. Inaccurate cost and time estimation in a software project may lead to devastating damage to software companies. To deal with this issue, software researchers have made significant efforts during recent years to improve and modify the available SCE models, one widely-used model of which is the Constructive Cost Model (COCOMO). This research aims to optimize the coefficients of a standard COCOMO model for SCE by combining genetic algorithm (GA) and environmental adaptation (EA) methods. The results indicate that the EA algorithm can solve the divergence issue of the genetic algorithm and optimize the coefficients of the COCOMO model as well. Moreover, the accuracy of the SCE in the case of combining GA and EA algorithms is 8% higher than when these algorithms are separately adopted.

Conclusion

Achieving higher accuracy in SCE problems is a challenge in Software Engineering. Despite numerous efforts, software researchers are style trying to improve the accuracy of the software effort estimation. Focusing on COCOMO model, this study combined GA and EA algorithms to improve the coefficients of this model to improve the prediction of software effort estimation. Using this hybrid model, the convergence problem of the GA was resolved. The results demonstrate that the hybrid algorithm produces satisfactory results compared to the standard COCOMO model and the EA method, reducing the mean error up to 12% and optimizing the PRED (25) by 8%.

Accepted Papers for IEEE

A Mutual One-Time Password for Online Application

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Keywords
One-Time Password
Security
Mutual
Web
Authentication

Abstract
One-time password is a kind of authentication that helps to increase the security through identification. Common methods in this area use extra devices such as smart card, token, and cell phone. However, these devices enforce users to carry hardware, to pay money, and to maintain. In this article, we propose a mutual one-time password which employs a formula to generate password for user, and every time user must use previous password and formula to compute new password. The communication line during authentication phase is supposed insecure; and a mutual authentication helps to increase the level of security. Security analysis shows how this method is secure; and comparison with some models shows its positive points.

Conclusion

In this research, we proposed a mutual one-time password that user registers a formula in the system and according to prior password, new password is calculated. This method assists to reduce the worries that coupled with old version of OTP. In addition, mutual authentication makes sure whether two parts are accurate or not. To increase the data communication all data during authentication are encrypted to impede man-in-the-middle, replay, and password guessing attacks, and it disables adversary to accomplish sever verifier attack. In part IV we explained that how proposed method could meet password security concerns, namely: password guessing attack, replay attack, masquerading server attacks, mutual authentication, hardware token loss, man-in-the-middle attack, using in public place. The focus of this research is on login phase than registration, and the reliability of this data is influenced by the fact that registration phase is secure. The secure registration phase and how user should memorize formula is not explained in this paper because it is beyond the scope of this study, and it is open for future research. It is better to conduct a survey on a group of users to determine how this kind of authentication is practical for society.

Accepted Papers for IEEE

Development of an Ethernet-Based Patient Remote Monitoring Device

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Keywords
Telemedicine
Signal Recording System
ECG
Blood Pressure
Serial Port
Ethernet

Abstract

Information can now be transferred more easily and rapidly than in the past because of technological developments. The network or Ethernet platform is one of the safest and fastest methods for receiving and transmitting data across long distances. Vital body signs, such as heart rate (HR) and blood pressure (BP), are examples of important information that may be transmitted via the network between the patient and the medical staff, allowing the medical team to monitor the patient's health status remotely. In this study, a system was designed that records the Electrocardiogram (ECG) and BP, then sends the data through a network connection via a serial to Ethernet converter (WIZNET). In LabVIEW software, an interface was created to display signals. In this way, the ECG and BP are presented online and at regular intervals, respectively. This system's performance was evaluated on 15 healthy persons for 45 minutes. This system may effectively handle the demand for medical staff to remotely access patients' vital signs in hospitals or medical centers. As a result, promoting such systems can effectively reduce treatment time and costs, therefore increasing the treatment process's efficiency.

Conclusion

In this study, a telemedicine system was designed and developed with the aim of being used in the hospital or clinical center for monitoring of ECG and blood pressure. As a result, single-channel hardware device for recording ECG and piezoelectric sensors for measuring blood pressure was developed. Then, a serial to Ethernet converter was used to send data over the Ethernet (network) platform. Data transmissions by Ethernet have significant advantages in transmission of patient information. The main advantages of this system include speed, security and reliability. In this system, after the ECG and blood pressure data were recorded from the subject and transferred to the computer via Ethernet, the data were displayed on the computer. The control panel and display of signals on the computer were designed by LabVIEW software. This device can also help the medical staff to reduce the workload for them to be more efficient in medical services. This system can be developed to record more vital signals. Advanced cardiac signal processing algorithms, such as arrhythmia detectors, can be used in this device. Also, by upgrading the software of this system, the data can be received on the Internet and made it possible for a specialist doctor to monitor and store patient data from anywhere in the world.

Accepted Papers for IEEE

Numerical Solution of a Class of Fuzzy Quadratic Programming Problems

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Keywords
Fuzzy
Quadratic
Piecewise Linearization
Linear Programming
A-Cuts

Abstract
Deal with the real world practical optimization problems, usually we face to fuzzy nonlinear programming problems (FNLPPs). This paper focus on a class of fuzzy quadratic programming problems (FQPPs). In this class, all of technical coefficients and constraint inequalities are fuzzy ones. Firstly, some definitions of fuzzy mathematics are introduced. Then, we discuss on fuzzy quadratic programming problems and introduce a new approach to solve approximately these problems. Finally, numerical examples are given to show the efficiency of the proposed approach.

Conclusion

In this paper, we focus on a class of fuzzy quadratic programming problems. In this class, technical coefficients (a_{ij}) and resources (b_i) are triangular fuzzy numbers. In research works that have been done in fuzzy quadratic programming problems, some conditions have been considered. In some studies, the objective function must be a convex function, also in other works, the matrix H must be a positive definite, positive semi definite or symmetric matrix. But the proposed approach in this paper can achieve numerical solution of a fuzzy quadratic problem without any precondition on objective function. As you can see, we have solved two examples that in example 2, we do not have considered any limited condition on matrix H.

Accepted Papers for IEEE

The AHP-TOPSIS Based DSS for Selecting Suppliers of Information Resources

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Keywords

Library Information Resources
Information Resources Suppliers
Library Acquisition
Library Management
Decision Support System (DSS)
Multi-Criteria Decision Methods (MCDM)
AHP
TOPSIS
Voyager
Victoria University of Wellington (VUW)

Abstract

The study's main aim was to determine the possible attach a DSS as a sub-system to Voyager, based on MCDM techniques for selecting suppliers of information resources as a part of the acquisition library system. Notably, Voyager is a library management system. The host organization in this study was the Victoria University of Wellington (VUW), Wellington, NZ. The population of the study included the system developers, subject librarians, managers, and decision-makers in the acquisition section in the libraries of VUW. Data collection tools included a review of literature, government documents and reports, questionnaires, evaluation forms, and interviews. For analyzing data used AHP and TOPSIS techniques and Inferential and descriptive statistics. Mind mapper, Excel, Expert Choice, TOPSIS, and other software employed in this research. The results of the study show which criteria are the best criteria for selecting information resources suppliers for the libraries. Also, it is shown that Voyager can use the recommended DSS as a sub-system to the main system.

Conclusion

Each library has a policy for collection development and selection of information resources, according to the survey results, all libraries can define the criteria for the selection of suppliers and analyze these criteria by MCDM techniques through a fuzzy approach. These steps can be defined in an analytical database that is part of a DSS, as a sub-system of the library management system. It is concluded that the priority for information resource selection criteria in VUW, is "End-Price". It also concluded that the first grade for suppliers in VUW belongs to Oxford. According to the results, attaching this system for supplier selection is possible for Voyager's integrated library systems. Some recommended DSS specifications are as the following: Recommended DSS is a web-based software that all decision-makers are logged in with User ID and Password, the system can implement not only for collection development (acquisition) but also for all sections, and the system has several forms, and the forms will fill by the decision-makers.

Accepted Papers for IEEE

Structure and Criteria Defining Business Value in Agile Software Development Based on Hierarchical Analysis

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Keywords

Agile Software Development
Business Value
Hierarchical Analysis
Evaluation Criteria
Agile Methods

Abstract

In recent years, agile software development as the most popular development approach has been considered by software teams and companies. In this approach, the business value is one of the concepts that achieving it especially has been emphasized in the agile software project. Despite this emphasis, a formal and appropriate definition of this concept has not been provided. In this study, to solve this challenge, we present a formal structure including necessary values and criteria for defining business value. Using hierarchical analysis, these criteria were weighted. The results of the analysis show what is called business value is often from the customer's point of view that improving competitive position, operational income, and return on investment are the most important components. Data analysis also shows that the customer perspective, financial perspective, and user perspective have a great effect on the definition of business value.

Conclusion

Knowing the value that agile can provide and measure, is very important in the development process. Introducing the business value as a unique and unified criterion is a very difficult job, because there is no specified and unit structure for determining the business value of a project and software, so far. This research was conducted to recognize the components of business value and weight each of them by the AHP method. Data analysis demonstrated that the "customer perspective" with a value of 54% is the most dominants and it has the most impact on determining the business value, compared to other viewpoints. After the customer perspective, "financial", "user", "product", and "development team" perspectives are effective in creating the business value in agile software development. In fact, in agile projects, what is called business value, is more definable from the customer, financial, and user viewpoints. Also, the weight analysis of each of these items and their subsets shows that the effect of the developing product in determining competitive situation, earning more money, and return on investment are important criteria for creating business value.

Accepted Papers for ISC

A Review on the Development of GAN Techniques in Convolutional Neural Networks and its Implementation on FPGA Accelerator

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Keywords

Generative Adversarial Network (GAN)
Convolution Neural Networks
FPGA
Accelerator Resources

Abstract

Recently, the growth of convolutional neural networks in various scientific fields can be seen dramatically. One of the important techniques in the field of neural networks is the Generative Adversarial Networks (GAN) and its implementation on FPGA accelerators. In this paper, we will provide an overview of the growth process of convolutional neural networks with using GAN technique and its implementation on FPGA accelerator over two years. In this work, we review five papers, the first of which is presented in 2017 and the other four in 2018. The method of comparing these articles is characterized by four distinct perspectives: Optimal utilization of accelerator resources, application of specific techniques, analysis of generated data, and finally the speed of execution in FPGA-based systems is a requirement.

Conclusion

By examining these five articles from four different perspectives, significant gains can be made that Each of these research Achievements helps researchers to develop neural networks, especially GANs. What was ultimately highlighted in the paper [13] is the beginning of the route and the initial rollout to enhance the implementation of the GAN technique on the FPGA. The paper [14] is an introduction to FPGA accelerator acceleration as well as a way to prevent inefficiency and optimal utilization of resources in accelerators as well as reduce chip memory utilization by Presentation a time-multiplexed design template and implementation of them. In [15], a model with binary weights and activation functions using integer-valued operations is presented. In this article, [16] also employs two models of MIMD and SIMD implementation for optimal utilization of resource. [17] Proposes a zero-free Data Reshaping scheme called LerGAN for ReRAM-based PIM, which eliminates zero-related computation. Speedup of learning and testing in accelerators, especially on FPGA- based accelerators, Because of the properties of parallelization, is of paramount importance.

Accepted Papers for ISC

Applying HP Counters for Hardware Trust Enhancement in IoT Platforms

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Keywords
Internet of Things (IoT)
Hardware Trojan (HT)
Hardware Performance Counter (HPC)
Hardware Trust

Abstract
Hardware Trojans (HTs) are malicious modifications pintroduced into hardware by attackers. Still an open problem at the device level, HT is even more challenging in the ground-breaking realm of internet of things (IoT). Online test methods proposed in the literature for Trojan monitoring in devices, are too costly for IoT processing nodes, where performance and power consumption are serious limitations. This paper presents a server-based HT detection method for IoT, based on remote monitoring of hardware performance counters (HPC). An HPC monitoring method is implemented on an MIPS32 microAptive UP, mapped on Cyclone V FPGA board, DE0-CV. The remote monitoring method is simulated in COOJA. The result shows the effectiveness of the proposed method to detect Trojans with system-level payloads.

Conclusion

A remote HPC monitoring is proposed in this paper for the purpose of hardware Trojan detection in IoT nodes. The approach is implemented on a MIPS32 microAptive UP microprocessor, mapped on the Cyclone V FPGA board, DE0-CV. The remote monitoring is then simulated by COOJA on a basic IoT network to prove the concept. The result shows the effectiveness of the proposed approach for detecting a large family of HTs with system-level payloads. Our future work includes evaluating the quality parameters and trustworthiness of grand-scale real-world IoT applications enhanced by the proposed approach.

Accepted Papers for ISC

Evaluate Digital Products using Emotion Analysis in Web-Based Content

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Keywords
Emotion Analysis
Deep Neural Network
Short-Long Memory
Platchik Emotional Model
Support Vector Machine

Abstract

Nowadays, the opinion of users, consumers and customers, in addition to business owners, is very necessary, important and useful for manufacturers, suppliers, marketers and, most importantly, to attract new customers. But analyzing all the opinions and understanding the feelings of previous experts to judge, evaluate, choose the right product by a customer is a very time consuming and difficult task. On the other hand, business owners need tools to understand the feelings of their customers. Therefore, in this study, the analysis of consumers' emotions based on the Platchik emotional model has been considered. Among the methods available in the world of information technology and past research, the use of text mining, machine learning and neural network-based models, including deep learning, has provided better results. In this research, a machine-based method has been used. This data set has been prepared by designing the site and emotion analysis by volunteers, and the generated data has entered the machine learning phase using a neural network after the pre-processing stages. The results, has been able to make accurate predictions with more than 75% accuracy

Conclusion

After analyzing the emotions and aggregating the opinions using machine learning methods, a comprehensive and sufficient report of the aggregated opinions of the users for a product is presented. More than 75% of the algorithm predictions were true. Also, after reviewing experienced and successful algorithms and models in related research, the deep neural network algorithm with a value of 50 for the embedding parameter has been performed as the best successful and acceptable result of storage and validation of this model.

Accepted Papers for ISC

Providing the Mechanism for Detecting the Level of Stress in Individuals Based on Signal Processing Electromyogram

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Keywords
Stress
EMG
Discrete Wavelet Transform
Feature Extraction

Abstract
Stress is one of the problems of today's societies that is rapidly developing in all aspects of life and can be the root of many psychological and physical problems. Stress occurs when a person exerts more pressure than he or she is accustomed to. Since stress is a factor that can severely affect the performance of individuals. Therefore, the diagnosis and evaluation of stress in professionals has become an important category. Early detection can prevent serious harm to people. One of the ways to diagnose stress is to use vital signals. In this study, vital nerve and muscle signal or electromyography was used to diagnose stress. For this purpose, the biceps muscle signal of 5 people in two positions before stress and during stress are analyzed by using mathematical parameters according to the values of the criteria and their evaluation in different people. The proposed method shows the signal correlation rate of 0.0970.

Conclusion

In the proposed algorithm, using several mathematical methods, a small measure of stress for very short intervals due to signal classification using wavelet transform is given. In fact, it can be said that the amount of stress is an inaccurate parameter that has different categories in each detection algorithms. In the present study, in addition to using data noise algorithms and evaluating the results based on data received from the database and use from the quantitative criterion of the correlation between the two stress signals and the rest signal as we implemented the number of people in the previous chapter using the proposed algorithm. Indicates the effectiveness of the proposed method in increasing the accuracy of stress detection.

Accepted Papers for ISC

New Approach for Solving Discrete Problems with Huge Amount of Variables Through Optimizing Current Genetic Algorithm Crossover Techniques

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Keywords
Genetic Algorithm
Uniform Crossover
Discrete
Problems
Iteration
Function Evaluation

Abstract
A genetic algorithm has been used to search for artificial intelligence and computing discipline. It assists researchers in finding the most optimized solutions to search problems based on the theory of natural selection and evolutionary biology. Genetic algorithms are robust search algorithm which is appropriate for search in large and complex data sets. There are many ways to reduce the individuals in GA through using the crossover and mutation techniques. The final vision of any GA is to maximize fitness function. This paper has proposed a new technique for genetic algorithm uniform crossover by optimizing previous methods. Proposed techniques are developed and tested in the MATLAB platform to see and evaluate the gained result with current crossover techniques. The result shows meaningful improvement in terms of reducing the number of iterations and function evaluations.

Conclusion

This proposed method can solve different discrete problems such as Knapsack problems and be integrated with further optimization for genetic algorithm crossover techniques. Besides, the proposed model can be combined with previous models using the Roulette Wheel and tournament selection algorithms to use all different method advantages and compare them to see the final results.

Accepted Papers for ISC

Increasing the Accuracy of Web Suggestion System using Fuzzy Neural Network and Heuristic Algorithms

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Keywords
Data Mining
Web Mining
User Behavior Patterns
Neural Network
Fuzzy System
MFO Algorithm

Abstract
The growing number of information on the web and the addition of different web pages, has made users face problems. In the current research, a profile is first created based on the behavioral characteristics of users at different sessions that result from web server logs. We then group them using the clustering method, then fuzzy inference system, extract the fuzzy rules according to the interests of the users and their clusters, and after obtaining the users' movement patterns, they Insert neural network into vector format. The evaluation criteria in this study is accuracy.

Conclusion

The information on the web is growing day by day. By identifying the behavior of users, their interests can be discovered and using the obtained results, desirable information can be provided to users. The purpose of the proposed method is to create a user profile, find their common movement patterns and provide a list of pages that the user is interested in viewing. In this proposed method, it has improved 7.56% compared to "KNN" algorithm and 4.41the results of the experiment show that the proposed algorithm has high accuracy in the number of pages proposed to users.

Accepted Papers for ISC

How Faculty Members Share Scientific Information Via Social Media: Factors and Barriers

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Keywords
Information Sharing
Social Media
Scientific Information
Faculty Members

Abstract

This study aimed at identifying the most important factors and barriers to sharing scientific information via social media among Iranian faculty members. The mixed methodology was used in this study combining qualitative and quantitative methods. The data were collected using online questionnaires. In general, three factors affecting information sharing in the academic environment were identified: organizational culture (including favorable environment for debating, kind of valued information, communication, mutual responsibilities, power distribution and recognition and reward), individual characteristics (including mutual trust, common language, individual time management) and organizational structure (including hierarchy, relationship network, knowledge storage, the transmission of knowledge and type of training for the task). Moreover, four information-sharing barriers were identified and classified in the following categories: individual differences, individual perception of sharing costs, lack of time, lack of recognition and reward, the vision of others, preference for explicit knowledge and resource and infrastructure.

Conclusion

It can be concluded that indicators such as relationship network, type of training for the task, transmission of knowledge and recognition and reward could also be related to two out of the three identified factors. Individual differences, individual perception of sharing costs, lack of time, lack of recognition and reward, the vision of others and preference for explicit knowledge, were regarded as personal barriers.

Accepted Papers for ISC

Infrasound Signal Classification Based on Combining Spectral and Sound Features

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Keywords
Infrasound
Feature Extraction
Spectral Features
Sound Features
Wavelet Transform
Spectral Entropy

Abstract
The speed and accuracy of data classification are essential factors in the online monitoring of infrasound waves. The available techniques for classifying these data are relatively high accuracy but not high-speed online. In this paper, using the combination of sound and spectral features, the speed of runtime and accuracy of classification have been improved. This method uses spectral entropy, a spectral feature, and the Linear Predictive Coding (LPC) sound features. The proposed approach classifies the infrasound waves generated from the three classes of the rocket launcher, volcano, and shuttle re-entry with a precision of 97% and a runtime of 1.0 seconds that are accurate to the existing methods. The obtained results show that this method has better speed and accuracy rather than existing methods.

Conclusion

This research proposes a method for classifying sub-sound data using spectral and audio properties to have high speed and accuracy. To do this, preprocessing was performed on sub-audio data to highlight these features. Then the spectral properties of the violent domain, including the entropy of the special values of the wavelet transformation matrix, the energy entropy of the wavelet transform, and the entropy of the signal strength of the wavelet transform plus the sound characteristics, including the linear prediction coefficients, were extracted, which ultimately yielded a grading accuracy of over 97Future work can be better for noise reduction Hilbert-Huang transformation algorithms, Wien filter, Wolf-Gaddel filter, etc. In the block for better categorisation of the Viterbi and Hidden Markov algorithms. Which uses (non-stationary signals such as sub-audio and voice signals to detect better).

Accepted Papers for ISC

An Accurate Approach for Solving a Class of Fuzzy Optimal Control Problems with Nonlinear Constraints

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Keywords

Nonlinear Optimal Control
A-Cuts
Fuzzy Control
Piecewise Linearization.

Abstract

Using fuzzy optimal control is gaining more interests in several fields including electrical engineering, medicine, economics and environments. This is because of its more coincidence on the nature of majority of systems and not-crisp form of their modeling equations. In this paper, a class of fuzzy optimal control problems containing a nonlinear system and linear objective function is studied and a more accurate procedure is proposed. $\alpha - cuts$ and a new piecewise linearization approach are used to solve the optimization problem. At first, the fuzzy nonlinear optimal control problem is obtained and converted to a crisp nonlinear problem by applying defined $\alpha - cuts$ sets of fuzzy system. Then, the problem is converted to an equivalent linear system using piecewise linearization method. Finally, the accuracy and effectiveness of the proposed approach is confirmed by several numerical examples.

Conclusion

In this paper, a class of fuzzy nonlinear optimal control problems is studied and a new approach is proposed based on α-cut sets and using a novel piecewise linearization approach to reduce this typical fuzzy nonlinear optimal control problem to an approximated linear programing problem. The optimal solution of the later linear programing problem is the best approximated solution of the original fuzzy nonlinear optimal control problem. The class that has been considered in this paper contains crisp control variable and the presented approach has to be improved to the class of fuzzy nonlinear optimal control problems that contains fuzzy control parameter.

Accepted Papers for ISC

General and Technique-Independent Challenges of Search-Based Software Testing

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Keywords

SBST
Search-Based Software Test
Test Case Generation
Security
Challenges
Problems

Abstract

In the development of a software system, different factors are involved. Due to the complexity of the work, the occurrence of human errors is inevitable. These errors cause the software to behave unpredictably and destructively in the real execution environment. For example, in some programming languages, there is an error called buffer overflow. It may cause unauthorized grants or access to the system in the network and security applications and even endanger user's privacy or can cause different problems in embedded systems. So software testing is required to increase the reliability and security of the developed software. There are several techniques for testing, among which, the search-based software test (SBST) and the automatic test case generation have a special place. The search-based software test is trying to convert the test problem into an optimization problem and achieve a better solution by searching the problem space. In addition to the benefits of a search-based test, there are challenges. This article provides a comprehensive overview of SBST problems. Understanding challenges is important because it helps scholars find solutions to these challenges or prepare new ideas that will ultimately help improve the quality of future tests and can bring greater security and confidence to the users.

Conclusion

SBST is a way of automating software testing which has attracted a lot of attention in recent years and a lot of progress has been made in this field. The main effort in this paper is to investigate some of the challenges and important issues in this field. It is hoped that this paper and proposed classification will provide a better insight into the search-based testing and help in future research.

Accepted Papers for ISC

Local Sequence Alignment with a Parallel Hash Based Model

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Keywords
Indexing
Sequence Alignment
Mapping
OpenMP

Abstract

The two main problems of alignment in genetic sequencing mapping are mapping speed and storage space. This study was conducted to provide a hash-based search algorithm to reduce data storage space, in addition to increased accuracy and speed. Like hash-based algorithms, the proposed method uses a hash table to store data, but changes the basis of its work to them, especially the Blast family, and uses a method other than Seed-and-Extend. This increases the speed several times. This method uses the compression technique to reduce the storage space so that the data is stored compressed in the hash table and used during the alignment process. there is no need to decrypt the data in the search and mapping steps, and the memory saved is preserved until the end of the process. Besides, unlike most hash methods, this method does not include all possible subsequences of the required length in the hash table when creating the table, and the table is created by passing and recording the position of the existing subsequences of the reference sequence. Another feature of the algorithm is the use of the multiprocessor technique to increase the algorithm execution speed so that the two main and time-consuming steps of the alignment process, one is creating a hash table and the other mapping, are done concurrently.

Conclusion

The number of DNA sequences is constantly increasing, and storing and searching for them within databases is time-consuming and requires a lot of memory. So, it seems necessary to use an efficient algorithm to search in a shorter time and optimal memory consumption. The purpose of this study, in addition to multiplying the algorithm execution speed and searching large databases faster than the Blast method and other methods based on Seed-and-Extend, can provide solutions to manage memory consumption, increase accuracy and speed. This Algorithm performs the indexing and mapping process using multiple processors with OpenMP library parallelization technique to take advantage of features such as simple implementation, portability, and ease of programming. One of the techniques used to increase the accuracy of the algorithm is the overlap of K-mers with a window of one length so that all K-mers of the sequences are extracted and entered in the alignment.

Accepted Papers for ISC

Improved Grey Wolf Optimization with Variable Weights for VANETs Clustering

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Keywords
Clustering
Gray Wolf Optimizer
Improved Gray Wolf Optimizer VANETs
Artificial Neural Networks

Abstract
Vehicular ad hoc networks (VANETs) are wireless communications networks that use low-tech wireless technologies to create unstable networks among road users. These networks are designed to make the connection between vehicle control and road traffic control. Congestion-based collection optimization is used to discovery near-optimal solutions since network clustering has a difficult NP problem. In this paper, the optimization of improved gray wolf with variable weight-based clustering algorithm for VANETs is presented, which mimics the social behaviors and hunting mechanisms of gray wolves to create efficient clusters. The simulation results show that the proposed framework performs better than the previous works compared to the number of group heads with different communication amplitudes, amount of bulges and network size. Minimizes the cost of routing for the entire network connection by efficiently reducing the number of clusters required. Fewer clusters also reduce the need for resources in the vehicle network.

Conclusion

Improved Gray Wolf Clustering Algorithm Proposed for Temporary Vehicle Networks Inspired by the Gray Wolf Daily Schedule, which uses four diverse situations illustrated by α, ۲, ۲ and ۲ to occurrence quarry. In the planned technique, the number of optimized bunches is occupied by converging the α-wolf value, because α-wolfs reach their best value. In this study, an improved gray wolf optimization for a variable weight-based bunching procedure for VANETs is presented, which mimics the communal behaviors and stalking apparatus of gray wolves to create efficient clusters. The results show that the proposed framework performs better than the related article compared to the amount of bunch bonces with different broadcast amplitudes, amount of bulges and network size. By efficiently reducing the amount of clusters essential, the cost of routing for the complete system connection is minimized. Fewer clusters also reduce the need for resources in the vehicle network. Regarding the upcoming course of this exertion, the VANET clustering procedure can be extra studied by executing various bio-inspired procedures such as candlestick and butterfly optimizer, dragonfly optimizer, ant milk optimizer and wall optimization procedure. . In addition, the planned task can be improved by modifying the dispassionate task based on user needs, and can also be used for multi-objective utilities. The planned procedure can also be used for active broadcast domains to vehicle bulges in the upcoming.

Accepted Papers for ISC

Machine Learning for High Risk Cardiovascular Patient Identification

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Keywords
Heart Failure
Machine Learning
Principal Component Analysis Classification

Abstract

According to the WHO (World Health Organization) Cardiovascular (Heart Failure) is a fatal disease that cause estimated 17.9 million people death every year. Heart Disease risk increase due to cholesterol, overweight and hypertension in short due to harmful behavior, heart disease risk increase [1]. Further according to the American Heart Association [2] symptoms(complement) are leg swelling, sleep problem, high heart rate and cough. Diagnosis is difficult due to the common symptoms because these symptoms associate with other diseases. The collection of medical data help physician to diagnosis the disease. Machine learning playing an important role in medical field as diagnosis of disease. Machine learning is used where data is large and difficult to extract useful information from data. In this study, we have used machine learning approach with rapid miner tool for heart disease classification. The experiment results show that performance of Logistic Regression is effective with accuracy of 85.22% than other considered machine learning models.

Conclusion

Machine Learning playing an important role for disease diagnosis e.g., breast cancer disease, Lungs Failure Diagnosis, Heart Failure Diagnosis and many more. In this work, Logistic Regression classifier performance is effective than other machine learning classifiers in terms of evaluation scores for Cardiovascular/Heart failure diagnosis. Further in this study, comparison of machine learning models is presented for the robustness of logistic regression model. The study has worth in terms of human life as early prediction of heart failure can save a life. The effective score of logistic regression can help medical staff Logistic Regression Navie Bayes Extra Tree Classifier Ridge Classifier Linear Discriminant Analysis to diagnose the heart failure with symptoms of heart failure. In the future, we have decided to work with CT-Scans images of heart for heart failure identification.

Accepted Papers for ISC

Improve the Automatic Detection of Welding Defects in Steel Structures Using Fuzzy Clustering Algorithm

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Keywords
Control System
Matlab
Welding Defects
Fuzzy Clustering Algorithm

Abstract
The metal-to-metal connection uses a special welding process, the quality control of which is so important that today the visual control method of destructive analysis has almost replaced the automatic non-destructive detection of welding defects. Among non-destructive methods, this particular method is more comprehensive due to the cheapness of radiography compared to other non-destructive methods and the simplicity of radiographic image analysis. However, the diagnosis of human welding defects may be related to errors due to the low quality of radiographic images. Therefore, today's radiographic images are analyzed by computer and automated image processing methods. In this work, a clustering method has been used to detect welding defects. The process is to first remove the negative effects such as noise in the image through preprocessing, improve the image quality, and then implement the fuzzy C-means (FCM) algorithm to identify welding defects. In this work, the independent variable is the number of clusters in the fuzzy clustering, and it has been shown that the accuracy of detecting defects in welding images increases as the number of clusters increases. Furthermore, based on the obtained results, the average accuracy of the method for small cracks, large cracks, and void defects is 92.01%, 94.67%, and 99.92%, respectively.

Conclusion

Automated methods are widely used to interpret and determine weld quality in radiographic images because of their simplicity, speed, and low cost. Numerous algorithms have been proposed to automatically detect welding defects, which are implemented with the help of machine vision techniques and digital image processing. In this work, an automatic method based on fuzzy clustering is used to detect regions related to welding defects. The FCM algorithm is a very effective method in digital image processing, and the algorithm also achieves high precision in the segmentation and detection of welding defects.

Accepted Papers for ISC

Credit Card Fraud Detection by Combining Neural Network and Grasshopper Optimization Algorithm

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Keywords
Fraud Detection
Grasshopper Optimization Algorithm
Neural Network

Abstract
With the accelerated development of internet finance, electronic funds transmission and the fast growth in credit card activities, credit card in today's life plays a very important role in various fields. There are several risks in this regard that are considered a serious threat to both issuing cards and cardholders. Along with the growing number of credit card fraud transactions, ways such as the forgery of credit cards, the usage of obsolete credit card fraud etc. lead to increased losses. So finding techniques for fraud detection accurately and quickly has developed an important topic in the current investigation. In this study, after data normalization and dimensions reduction with the PCA algorithm, we classified the data using the improved perceptron neural network with the grasshopper algorithm. In this study, we used the grasshopper algorithm to regulate the weights and biases of the neural network. Finally, we were able to achieve 99.20% accuracy.

Conclusion

In this paper, the perceptron neural network method was used to increase the accuracy of classification and detection of credit card fraud. To double the classification power, the weights and bias of the network were obtained by the grasshopper algorithm, so that the weights and the bias of the network were considered as grasshopper and the objective function of classification accuracy was used to evaluate the obtained values. Finally, we were able to achieve 99.2% accuracy.

Accepted Papers for ISC

مقالات پذیرفته شده فارسی

بهینه سازی هزینه ارتباطات آگاه از افرازبندی اولیه در محاسبات کوانتومی توزیع شده

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چکیده

به دلیل پیچیدگی های ساخت کامپیوترهای کوانتومی، برای داشتن یک کامپیوتر کوانتومی بزرگ، یک راه حل مناسب، ساختن شبکه ای از کامپیوترهای کوانتومی با اندازه محدود است که از طریق یک کانال کوانتومی یا کلاسیک به هم پیوند شده اند و می توانند رفتار کل سیستم کوانتومی را اجرا کنند. به عبارتی مدل مدار محاسبات کوانتومی می تواند به صورت محاسبات کوانتومی توزیع شده گسترش یابد که در آن هر زیرسیستم داده های خود را به صورت تقاضا از طریق کانال ارتباطی به قسمت های دیگر ارسال می کند. یک مکانیسم قابل اعتماد برای چنین ارتباطی با استفاده از مفهوم مخابره از راه دور کوانتومی بین گره های یک سیستم کوانتومی توزیع شده است. به حداقل رساندن تعداد مخابرات از راه دور کوانتومی بین گره های یک کامپیوتر کوانتومی توزیع شده به عنوان معیاری برای سنجش بهره وری آن در نظر گرفته شده است. در کار مشابه قبلی، یک روش برای بهینه سازی تعداد مخابرات کوانتومی بین دو بخش یک سیستم کوانتومی توزیع شده ارائه شده است و با استفاده از یک الگوریتم پیشنهادی، هزینه ارتباطات (تعداد مخابره از راه دورهای کوانتومی) را در بین دو بخش این مدار کوانتومی توزیع شده بهینه می کند. مشخص است که با تغییر افرازبندی اولیه، می توان به جواب های دیگری رسید. در این مقاله، مدار کوانتومی به یک گراف وزندار نگاشت می شود و به سه روش افراز بندی گراف، یعنی KL ، FM و مبتنی بر الگوریتم‌های ژنتیک، به دو بخش افراز می شود. روی هر افرازبندی، ادامه الگوریتم روش قبلی برای بهینه‌سازی هزینه ارتباطات اجرا شده و در نهایت خروجی با کمینه تعداد هزینه ارتباطات گزارش می شود. نتایج اجرا بر روی مدارهای محک نشان می دهد روش پیشنهادی نسبت به روش قبلی هزینه ارتباطات را به طور متوسط٪ ۱۲/۵۱ کاهش می دهد.

کلمات کلیدی

محاسبات کوانتومی توزیع شده
مخابره از راه دور کوانتومی
بهینه سازی
هزینه ارتباطات
الگوریتم افرازبندی گراف

نتیجه گیری

در این مقاله روشی جدید برای بهینه سازی هزینه ارتباطات دریک سیستم توزیع شده کوانتومی اجرا شده و در نهایت خروجی با کمینه تعداد هزینه ارتباطات گزارش می شود. به عنوان کارهای آینده پیشنهاد می شود ساختاری برای مدارات کوانتومی استخراج شود که به صورت ساخت یافته روش افراز بندی اولیه را انتخاب کنیم. هم چنین پیشنهاد می شود روش-های افرازبندی دیگر و جدیدتری نیز مورد بررسی قرار بگیرند. از همه مهمتر اینکه فاز افرازبندی اولیه و بهینه سازی هزینه ارتباطات در مدارکوانتومی توزیع شده باهم دیده شود نه به صورت بخش جداگانه که در این صورت می توان به جواب بهتری رسید.

مقالات پذیرفته شده فارسی

هماهنگی در یک زنجیره ی تأمین سه سطحی با محدودیت های مالی

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چکیده

هماهنگی در زنجیره‌ی تأمین به عنوان ابزاری برای حفظ مزیت رقابتی و افزایش سودآوری شرکت‌ها به طور وسیعی مورد استفاده قرار گرفته است. با این حال، این راه حل نیز تا زمانی که مشکلات مالی شرکت‌ها در هنگام برنامه ریزی عملیاتی نادیده گرفته شوند ممکن است با شکست مواجه شود. برای حل این مشکل، در این پژوهش یک ساز و کار هماهنگی برای یک زنجیره‌ی تأمین سه سطحی با استفاده از تأمین مالی داخلی در شرایط وجود محدودیت‌های مالی توسعه داده شده است. این مسأله به صورت یک مسأله‌ی برنامه ریزی دوهدفه که همزمان هزینه‌های کل سیستم اعم از هزینه‌های عملیاتی و مالی و همچنین سطح سرویس را بهینه می‌کند، مدل شده است. مدل پیشنهادی توسط روش $\varepsilon - constraint$ حل شده است. نتایج حل مدل حاکی از آن است که ساز و کار هماهنگی پیشنهادی قادر به برقراری سطح سرویس کامل (۱۰۰٪) به مشتری نهایی می‌باشد، در حالی که در حالت غیر هماهنگ دستیابی به بیشتر از ۵۰٪ سطح سرویس غیر ممکن است. علاوه بر آن، هزینه‌های عملیاتی و مالی زنجیره‌ی تأمین مذکور با اعمال هماهنگی کاهش می‌یابند.

کلمات کلیدی

هماهنگی زنجیره‌ی تأمین
محدودیت مالی
اعتبار تجاری
پیش پرداخت
بهینه سازی دو هدفه

نتیجه گیری

در این پژوهش برای پیشگیری از اختلالات عملیاتی حاصل از مشکلات مالی در زنجیره‌ی تأمین، دو نوع هماهنگی به یک زنجیره‌ی تأمین سه سطحی که با کمبود بودجه مواجه است، اعمال شد: هماهنگی بین اعضای زنجیره‌ی تأمین و همچنین هماهنگی بین جریان‌های مواد و جریان‌های مالیِ زنجیره تأمین. مدل هماهنگی مسأله، تحت تأمین مالی داخلی از طریق اعتبار تجاری و پیش پرداخت به صورت یک مدل بهینه‌سازی دوهدفه، با اهداف حداقل سازی هزینه و حداکثرسازی سطح سرویس فرموله شد. سپس مدل‌های توسعه داده شده، توسط روش $\varepsilon - constraint$ و با استفاده از نرم افزار GAMS حل شده است و نتایج حاصل تحلیل شد. نتایج، حاکی از آن بود که در حالت غیر هماهنگ، تولیدکننده‌ی محصولات واسطه در سطح دوم قادر به پاسخگویی به حداکثر ۵۰٪ از تقاضای سطح سوم زنجیره‌ی تأمین می‌باشد. این عدم توانایی و خدمت رسانی ضعیف، در حالت غیر هماهنگ، نتیجه‌ی کمبود بودجه و محدودیت در تأمین مالی می‌باشد. اما در مدل هماهنگ، این کاستی، جبران شده و تمامی تقاضای سطح سوم زنجیره‌ی تأمین پاسخ داده می‌شود. علاوه بر این، با اعمال مکانیسم هماهنگی، هزینههای کل سیستم کاهش می‌یابد. در این پژوهش، فرض بر این است که تأمین‌کنندگان با مشکلات مالی مواجه نیستند، بنابراین، در نظر گرفتن محدودیت سرمایه برای تأمین‌کنندگان و همچنین ریسک نکول برای تولیدکننده در سطح دوم می‌تواند به عنوان چشم انداز توسعه‌ی این پژوهش مطرح شود.

مقالات پذیرفته شده فارسی

حل مسأله رنگ آمیزی جمعی گراف با استفاده از الگوریتم ابتکاری

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چکیده

رنگ آمیزی جمعی گراف، اختصاص اعداد طبیعی به رئوس یگ گراف ساده می باشد، طوری که مجموع اعداد اختصاص داده شده به رئوس گراف، کمینه گردد. مهمترین کاربرد آن در حوزه زمانبندی می باشد. برای این مسأله که جزو مسائل $NP-Hard$[1] می باشد، تاکنون حل دقیقی ارائه نشده است. لذا در این پژوهش، یک الگوریتم ابتکاری مرکب، بر مبنای ایده شناسایی مجموعه های مستقل رئوس گراف و اختصاص کوچکترین عدد طبیعی در دسترس، برای بزرگترین مجموعه مستقل، توسعه داده شده است. الگوریتم پیشنهادی، بر روی گراف های موجود در کتابخانه های معروف گراف هایی که به صورت تصادفی تولید شده اند، آزمایش شده است. نتایج، نشان دهنده کارایی الگوریتم ارائه شده می باشد.

کلمات کلیدی

رنگ آمیزی جمعی گراف
مجموعه مستقل رئوس گرافی
الگوریتم فراابتکاری
پیش پرداخت

نتیجه گیری

در این تحقیق یک الگوریتم ابتکاری برای مسئله رنگ آمیزی جمعی گراف ارائه شد. ورودی این الگوریتم یک گراف دلخواه و خروجی آن نیز یک رنگ آمیزی رأسی گراف است که در آن، مجموع رنگی تا حد ممکن کمینه شده است. عملکرد این الگوریتم ابتکاری، روی گراف های تصادفی کتابخانه DIMACS و COLOR02 آزمایش شد و نتایج آن با الگوریتم های ادبیات موضوع مقایسه شد. با توجه به نتایج عددی، نشان داده شد که الگوریتم ارائه شده دارای کارایی بسیار خوبی است و در اکثر موارد به نتایج خوبی رسیده است. با توجه به پیچیدگی فضای جواب مسئله، بعید به نظر می رسد که بتوان با استفاده از الگوریتم های فراابتکاری به نتایج بسیار بهتری دست یافت. پیشنهاد می شود که برای کارهای آینده، از الگوریتم های ترکیبی استفاده شود که عناصر زیر را شامل شود:

- شناسایی و استفاده از یک ویژگی کارای مربوط به ساختار جواب بهینه. شناسایی و استفاده از بزرگترین مجموعه مستقل رئوس گراف، کاری در این راستا بود که در این تحقیق انجام شد. ممکن است ویژگی های دیگری در ساختار جواب های بهینه یا زیر بهینه وجود داشته باشد. بایستی این ویژگی ها شناسایی شده و الگوریتم به سمت جواب هایی هدایت شود که دارای این ویژگی ها هستند. این امر، باعث افزایش کارایی و هدفمندی جستجو می شود.
-از یک یا دو الگوریتم فراابتکاری به عنوان هسته اصلی الگوریتم استفاده شود.
- در صورت امکان، از تکنیک های برنامه ریزی ریاضی از جمله برنامه ریزی عدد صحیح یا برنامه ریزی محدودیت برای افزایش عمق جستجو استفاده شود.

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[1] Non-deterministic Polynomial Hard problems.

مقالات پذیرفته شده فارسی

مقایسه شبکه های عصبی YOLOv3 ، YOLOv5s و MobileNet-SSD V2 برای تشخیص ماسک صورت در زمان واقعی

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چکیده

امروزه، یادگیری عمیق با استفاده از موارد متعدد پتانسیل واقعی خود را نشان می‌دهد و در حوزه‌های مختلف تکنولوژیکی اهمیت دارد. یکی از پرطرفدارترین کاربردهای یادگیری عمیق، تشخیص و ردیابی اشیا است. محصولات اخیر نتایج امیدوارکننده ای را در همین رابطه نشان داده است. این مقاله رویکردهای سیستماتیک مختلفی را مورد بحث و مقایسه قرار می‌دهد که تصاویر را تجزیه و تحلیل نموده و مشخص می‌کند که آیا فرد ماسک صورت را به درستی، نادرست و یا اصلاً استفاده نموده است یا خیر. تشخیص ماسک بر روی تصاویر، ویدئوها و سیستمهای نظارتی در زمان واقعی، با استفاده از سه الگوریتم یادگیری ماشینی پرکاربرد انجام می‌شود YOLOv3 ، YOLOv5 و MobileNet-SSDv2 هرمدل وجود ماسک را روی صورت افراد تشخیص می‌دهد که بر اساس دقت آن‌ها و میزان سرعت پردازش ویدیو قضاوت می‌شود. نتایج عملکرد سه الگوریتم برای تشخیص وجود ماسک صورت بر روی یک فرد در زمان واقعی بر حسب FPS تعیین میگردد.

کلمات کلیدی

YOLOv3
YOLOv5
MobileNet-SSD
mAP
FPS

نتیجه گیری

دراین مقاله، سه مدل مقایسه شده است و هر یک از آنها ویژگی های منحصر به فرد خود را نشان می دهند. هر یک از مدل ها در کاربرد مورد نیاز تشخیص ماسک موفق بودند، با YOLOv5s به دلیل ترکیب سرعت و دقت، بهینه ترین مدل برای استقرار در زمان واقعی است. دو مدل دیگر نیز مدل های بسیار مناسبی هستند که سناریوهای مورد استفاده متفاوتی دارند. می‌توان نتیجه گرفت که استفاده از برنامه‌های بینایی کامپیوتری در زمان واقعی امکان‌پذیر است و همه این مدل‌ها برای تبدیل به محصولات قابل فروش مناسب هستند.

مقالات پذیرفته شده فارسی

شبکه های عصبی پیچشی حساس به هزینه برای طبقه بندی زیر گروه های سرطان

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چکیده

طبقه‌بندی زیرگروه‌های سرطان وظیفه بسیار مهمی برای تشخیص و پیش آگهی سرطان است. تعداد بالای ژن‌ها در پایگاه داده بیان ژن و عدم تعادل داده‌ها بین طبقات مختلف، تأثیر مستقیمی بر پیچیدگی و عملکرد مدل‌های طبقه‌بندی زیرگروه سرطان دارد. از سوی دیگر، یک مدل شبکه عصبی کانولوشن (CNN) به همراه یک تابع هزینه اصلاح شده به کمک استراتژی حساس به هزینه برای افزایش دقت مدل در شناسایی کلاس‌های اقلیت پیشنهادشده است. نتایج نشان می‌دهد که انتخاب ژن‌های مناسب برای طبقه‌بندی به همراه استفاده از یادگیری حساس به هزینه، نسبت به مدل CNN بدون انتخاب ویژگی و یادگیری حساس به هزینه سه معیار دقت، فراخوانی و صحت را به ترتیب حدود۱۱٪، ۱۰٪ و ۱۸٪ افزایش می دهد.

کلمات کلیدی

دسته‌بندی
داده‌های نامتوازن
زیرگروه‌های سرطان
داده‌های بیان ژن
یادگیری عمیق CNN

نتیجه گیری

یادگیری عمیق (DL) یک تکنیک پرکاربرد در ناحیه بیان ژن است. بااین‌حال، این الگوریتم‌ها در مورد داده‌های با ابعاد بالا و همچنین داده‌های نامتعادل با چالش‌های زیادی روبرو هستند. تعداد زیاد ویژگی‌ها، پیچیدگی مدل‌های یادگیری عمیق را افزایش می‌دهد و همچنین عدم تعادل بین کلاس‌های سرطان، عملکرد مدل طبقه‌بندی را کاهش می‌دهد. برای رسیدگی به این چالش‌ها، یک رویکرد CNN پیشنهاد شد که با تکنیک انتخاب ژن ادغام شد. یک استراتژی حساس به هزینه نیز برای مقابله با داده‌های نامتعادل استفاده شد. در این استراتژی، طبقه‌بندی‌های اشتباه مختلف دارای هزینه‌های مشخصی هستند که در هنگام محاسبه میزان خطا اعمال می‌شود و برای بهینه‌سازی پارامترهای شبکه استفاده می‌شود. در روش پیشنهادی، ماتریس هزینه با استفاده از یک تابع فرمول‌بندی شده تعیین می‌شود. برای ارزیابی روش پیشنهادی از مجموعه داده استفاده شد. معیارهای دقت، فراخوانی، صحت و F1-Score برای مقایسه روش پیشنهادی با مدل‌های مشابه استفاده شد. اجرای حساس به هزینه CNN با نسخه‌های غیر حساس مقایسه شد. نتایج نشان داد که روش پیشنهادی توانایی تشخیص بالاتری برای طبقات اقلیت دارد. به‌طور متوسط، مدل پیشنهادی عملکرد تشخیص سرطان زیرگروه را حدود ۳٪ افزایش داده است.

مقالات پذیرفته شده فارسی

آنتولوژی معتبر برای جنبه های مختلف تیم های خودسازمانده در توسعه نرم افزار چابک

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چکیده

توسعه نرم افزار چابک به عنوان یک پارادیم مهندسی، به دلیل مزایای متعددی که به همراه دارد، مورد توجه شرکتها و تیمهای نرم افزاری قرار گرفته است. مفهوم خودسازمان دهی تیمی به عنوان یکی از الزامات کلیدی در توسعه نرم افزار مورد تاکید تحقیقات پیشین بوده است. اگرچه تحقیقات اندکی در مورد تعریف مستند و رسمی از این مفهوم دیده می شود. فقدان چنین خلا تحقیقاتی در عمل موجب بروز دو چالش جدی شده است. اولین چالش این است که رویکرد یا ابزاری برای اندازه گیری و مقایسه خودسازمان دهی بین تیمها وجود ندارد و چالش دوم اینکه تصورات و ذهنیات متفاوتی در مورد خودسازمان دهی و پذیرش آن در متدولوژیهای چابک وجود دارد که گاها با آنچه در برخی از مطالعات ذکر شده است، فاصله دارند. در این میان، دستیابی به خودسازمان دهی تیمی به شکلی که در توسعه چابک مورد توجه است نیز ساده نبوده و مشکلات و چالشهای متعددی به همراه دارد. در این مطالعه، آنتولوژی تیمهای خودسازمان ده در توسعه چابک با محوریت مزایا، چالشها، ابعاد و ارکان این مفهوم ارائه شده است. به منظور درک بهتر این ابعاد، آنتولوژی مزبور در چهار بخش اهداف، موانع، چالشها و پروژه تقسیم شده است. به منظور اعتبارسنجی آنتولوژی ارائه شده، این آنتولوژی با کمک افزونه Evaluator OOPS! و بر اساس معیارهای ثبات، تکامل، اختصار، ساختار، عملکرد و قابلیت استفاده و با استفاده از روش معیارمحور مورد ارزیابی قرار گرفت و پس از کشف نواقص و رفع آنها اعتبار آن مورد تائید قرار گرفت.

کلمات کلیدی

توسعه نرم افزار چابک
آنتولوژی
تیم های خودسازمان ده

نتیجه گیری

خودسازمان دهی تیمی در توسعه نرم افزار چابک به عنوان یک مفهوم بنیادین در همه متدولوژی ها و تمرینات چابکی نقشی کلیدی دارد. با اینحال، ابعاد این مفهوم به دلیل ماهیت آن چندان شفاف و روشن نیست. این تحقیق با تمرکز بر این چالش، اقدام به ارائه آنتولوژی تائید شده ای از این مفهوم نموده است. در این آنتولوژی چهار محور کلیدی اهداف، پروژه، چالشها و موانع به عنوان بخشهای کلیدی چنین آنتولوژی شناسایی و شفاف سازی شده است. این آنتولوژی بر اساس معیارهای شناخته شده اعتبارسنجی یک آنتولوژی مورد آزمون قرار گرفته و تائید گردیده است.

مقالات پذیرفته شده فارسی

بهبود تخمین هزینه توسعه نرم افزار مبتنی بر تشابه با استفاده از مدل تکاملی یادگیر

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چکیده

یکی از مهمترین و بحرانی ترین عوامل در توسعه پروژه های نرم افزاری تخمین مناسب هزینه ها است. این فعالیت که پیش از آغاز پروژه و در مراحل اولیه باید انجام گیرد به دلیل درگیر بودن عوامل متعدد انسانی، فنی و سازمانی همواره با چالش‌ها و مشکلات متعددی روبرو است. با این حال اهمیت تخمین چنان است که یکی از مهمترین عوامل شکست یا توفیق پروژه ها نیز می باشد. دیدگاه ها و روش های متعددی در خصوص نحوه انجام تخمین ارائه شده است که یکی از مهمترین آنها دیدگاه مبتنی بر تشابه می باشد. در سالهای اخیر تلاش های زیادی صورت گرفته است که در این دیدگاه از تکنیک ها و روش های مناسبی در جهت افزایش دقت تخمین استفاده گردد. بهره گیری از ویژگی های مناسب و وزن دهی ویژگی ها نمونه ای از این تلاش است. با این حال اگرچه تاکنون روش های مختلفی برای بهینه‌سازی وزن ویژگی ها در تابع شباهت مبتنی بر تشابه پیشنهاد شده است اما هنوز هم دستیابی به افزایش دقت تخمین در این تکنیک ها یک حوزه تحقیق مناسب است. این مطالعه در جهت بهبود تخمین هزینه توسعه نرم افزار، میزان تاثیر الگوریتم LEM بر بهینه سازی وزن ویژگی ها را مورد بررسی قرار داده است و اقدام به ارائه راهکاری نوین در این خصوص نموده است. در این تحقیق میزان اثربخشی الگوریتم بر روی دو مجموعه داده Desharnais و Maxwell بررسی شده است و از معیارهای MMRE ، PRED(0.25) و MdMRE برای ارزیابی و مقایسه روش پیشنهادی با دیگر الگوریتم های تکاملی از جمله ژنتیک، تکامل تفاضلی و ازدحام ذرات استفاده شده است. نتایج نشان می‌دهد این الگوریتم توانسته است بهبود قابل توجهی را به دست آورد.

کلمات کلیدی

تخمین هزینه نرم افزار
مدل تکاملی یادگیر
تخمین مبتنی بر تشابه
بهینه سازی وزن ویژگی ها

نتیجه گیری

در این مقاله ما یک تکنیک بهینه سازی وزن بر اساس مدل تکاملی یادگیر در تخمین مبتنی بر تشابه پیشنهاد کردیم. مدل پیشنهادی بر روی دیتاست های مختلف و در حالت های متفاوت مورد آزمایش قرار گرفت. مطالعات تجربی در این مقاله نشان می دهد که در بیشتر موارد نتایج حاصل از مدل پیشنهادی در معیارهای ارزیابی متفاوت رضایت بخش بوده است. در ادامه تحقیق چارچوب پیشنهادی با دیگر الگوریتم های تکاملی از جمله ژنتیک، تکامل تفاضلی و الگوریتم ازدحام ذرات مورد مقایسه قرار گرفت که در این موارد نیز نتیجه مطلوب تری ارائه شده است. به دلیل اینکه مدل تکاملی یادگیر اعضای جمعیت جدید را توسط یک سری فرآیند تولید و ایجاد فرضیه می سازد، می تواند مشکل تصادفی بودن تولید جمعیت در الگوریتم های مبتنی بر مدل داروین را تا حدودی مرتفع سازد و همچنین سرعت همگرایی را بالا برد. این امر می تواند باعث جذب شدن بسیاری از محققین حوزه تخمین هزینه به این الگوریتم شود.

مقالات پذیرفته شده فارسی

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