

DR. A. H. S. BUKHARI
POSTGRADUATE CENTER

ICT

UNIVERSITY OF SINDH JAMSHORO



ICETIET-2022

1ST INTERNATIONAL CONFERENCE ON EMERGING TRENDS IN INFORMATION AND ENGINEERING TECHNOLOGIES

at

DR. A. H. S. BUKHARI POSTGRADUATE CENTER OF
INFORMATION & COMMUNICATION TECHNOLOGY,
FACULTY OF ENGINEERING AND TECHNOLOGY
UNIVERSITY OF SINDH, JAMSHORO, PAKISTAN

on

24TH & 25TH MARCH, 2022

ABSTRACT BOOKLET

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**1st International Conference on Emerging Trends in
Information and Engineering Technologies**

at

**Dr. A. H. S. Bukhari Postgraduate Center of
Information & Communication Technology,
Faculty of Engineering and Technology,
University of Sindh, Jamshoro**

24th & 25th March 2022

Abstract Booklet



Conference Brief

The 1st International Conference on Emerging Trends in Information and Engineering Technologies (ICETIET 2022) is a unique and premier platform which will provide exciting opportunities for research scholars, academicians, and students to publish, share and discuss the latest research results, knowledge, ideas, current trends and future directions in information and engineering technologies. The conference will host leading scientists, prominent researchers from the academia and the industry, who will give several keynote speeches, and will participate actively and provide valuable feedback through interactive sessions.

The conference aims to cover all areas of Information Technology, Computer Science, Software Engineering, Electronic Engineering, Telecommunication Engineering, Data Sciences, Artificial Intelligence, Internet of Things, Information Systems and Business Information Technology. The main goal of this event is to promote and strengthen research culture across the country in general, and the province of Sindh in particular. It is hoped that scientific and intellectual activity generated through this conference may help to address some of the major societal challenges through innovative ideas and solutions. Furthermore, it is also hoped that the industry will benefit in that the mechanisms, tools, solutions proposed (or developed) could be used as a foundation that industry can capitalize on for their further development.



Conference Chairman Message



Prof. Dr. Lachhman Das Dhomeja

Director A. H. S. Bukhari Postgraduate Center of ICT and Conference Chairman

I am extremely happy that we have got together at this memorable academic event – the 1st International Conference on Emerging Trends in Information and Engineering Technologies 2022 (ICETIET 2022) being hosted by Dr. A. H. S. Bukhari Postgraduate Center of Information and Communication Technology, Faculty of Engineering and Technology, University of Sindh, Jamshoro. I welcome you all at this event.

There has been a significant role of technology in any country's economic growth and well-being of the society, and advancements in technology have always played a key role in increased economic growth and improved well-being of the society. Like many countries across the world, Pakistan 2025 vision, among other targets, includes initiatives to transform urban cities into smart cities, which may well include smart homes, smart health systems, smart education systems, smart offices, smart airports, etc. While emerging technologies including Sensing, Cloud Computing, Artificial Intelligence, Data Science, etc. have played a vital role towards realizing smart spaces, successful realization of the smart spaces is yet to be achieved. This requires researching into these emerging technologies for their potential use in bringing the realization of smart spaces close to reality.

The purpose of holding this conference is to provide a platform to the research community and MPhil and PhD students to discuss and share latest research ideas, research challenges, and propose solutions and future directions in aforementioned emerging technologies. Knowledge learned from this conference in terms of proposition of research ideas, solutions and future directions in such interesting emerging research fields may well serve as significant contribution towards transformation of physical spaces into smart spaces as well as digitization of various manual processes involved in government and private organizations.

I am thankful to the chief guest of the conference, Ms. Tanzilla Umi Habiba for sparing some time out of her busy schedule to grace this academic occasion. I would also like to thank all the sponsors for their continued support over the years and the conference committees for spending their time and energies in organizing this important conference

Last but not the least, I am highly thankful to all the researchers and authors for their academic contribution at the conference and I am sure the participants will have a good time academically & socially.

Dean's Message



Prof. Dr. Khalil-UR- Rehman Khoubati

**Dean, Faculty of Engineering & Technology and
General Chair**

I am pleased to welcome you all in the First International Conference on Emerging Trends in Information and Engineering Technologies (ICETIET 2022), being organized by Dr. A.H.S. Bukhari Postgraduate Center of Information and Communication Technology, Faculty of Engineering and Technology, University of Sindh, Jamshoro.

I believe that this international conference will provide tremendous opportunities for sharing and exchanging of original research ideas and foster scientific discussion, thereby providing the much-needed inspiration for future research, broadening knowledge about the various fields Engineering and Technology.

The Government of Pakistan, and the Government of Sindh's Department of Information, Science and Technologies, in particular, are constantly striving to improve the citizens' quality of life and economic well-being by ensuring the availability of accessible, affordable, reliable and high-quality information and communication technology services in various sectors, including, health, e-governance, education and commerce. There is great potential for further growth in both the scope and quality of these services, and the prospects look bright with continued efforts and commitment.

It is our strong belief that the adoption of emerging digital technologies and innovative applications will provide the support for socio-economic development and transformation of economic activities, good governance, healthy social interaction, achievement of sustainable development goals and the emerging dynamics of a knowledge-based society and knowledge-based economy.

I am thankful to all the researchers and authors for their valuable research contributions, and for presenting their papers at this conference. The success of this conference cannot be achieved without the contribution from everyone, and it is truly hoped that the participants will find the discussions productive and fruitful and will enjoy the opportunity for setting up future collaborations.

Last but not the least, we are sincerely thankful for all the contributions and support provided by the various individuals and organizations.

I take this opportunity to thank you all once again for joining us. I am confident that all the participants will have highly fruitful and rewarding exchanges during the conference and will have an enjoyable experience.

Vice Chancellor Message



Prof. (Meritorious) Dr. Muhammad Siddiqui Kalhoro

Vice Chancellor and Conference Patron

It gives me great pleasure to welcome you at the **First International Conference on Emerging Trends in Information and Engineering Technologies (ICETIET) 2022**, being organized by Dr. A. H. S. Bukhari Postgraduate Center of Information and Communication Technology, Faculty of Engineering and Technology, University of Sindh, Jamshoro.

It is the need of the time to arrange such academic events to provide a platform to the research community in the fields of Engineering and Technology, to highlight their remarkable contributions and to realize the still untapped potential of the various applications in so many areas of our lives. It is hoped that the research contributions to this conference and the presentations planned in the two days will further highlight the importance of these applications. This international conference will also serve as a great opportunity to achieve our vision of becoming a leading academic and research institution having strong connections with bright-minded academicians and researchers.

At University of Sindh, we are constantly striving to provide quality education, while at the same time working on addressing the issues like gender equality, climate change and poverty elimination, by connecting the Academia and the Industry to provide our highly skilled graduates sustainable market-oriented jobs, so that they can play their proper role in the progress and growth of the country. As has been evident over the last few years, after the boom of term Digital Pakistan many of the scientists and engineers, like the participants of this conference, have gone on to play key roles in building capacity in information and communication technologies. University of Sindh has already taken such steps to digitize its system and has established fully IT-equipped departments like, IT Services Centre, Student Financial Aid Office, Skills and Career Development Centre, National Incubation Centre, Industrial Liaison Desk, to name a few.

Conferences like these provide a valuable opportunity for research scientists, industry specialists and decision-makers to share their experiences with the experts and relevant audience. I am thankful to all the researchers and experts for being a part of this conference and sharing their knowledge at this event.

I am also thankful to the representatives of the government, industry sponsors and other organizations who have supported us in one way or other. Their continued support will prove invaluable in making this event a success.

I am sure that the participants will have intellectually stimulating discussions and exchange of ideas during this two-day event. I wish you an enjoyable stay in Jamshoro and a successful conference.

Chief Guest Message



Ms. Tanzila Umi Habiba

Special Assistant to the Chief Minister
Information Science and Technology Department
Government of Sindh

It is a matter of great pride and pleasure to know that the **First International Conference on Emerging Trends in Information and Engineering Technologies (ICETIET 2022)** is being organized by Dr AHS Bukhari Postgraduate Centre of Information and Communication Technology, at the Faculty of Engineering and Technology, University of Sindh, Jamshoro.

It is heartening to note that University of Sindh has been consistently making great progress at providing high-quality academic and research environment to its students. The importance of good quality education based on skill-based learning and research cannot be overestimated in this information age. It is also of paramount importance that there should be a culture of constant scientific inquiry and research to tackle the constant challenges posed by the ever-advancing fields of information and communication technologies.

I am hopeful that this conference will prove to be an attractive platform for academicians, researchers, practitioners, and technical experts as well as students in the fields of engineering, information and communication technologies, to share innovative ideas, engage in fruitful scientific discussion.

I would like to congratulate the organizers for expending their time and energies in organizing this important conference and to express my best wishes for its success. I also wish that the present conference will prove to be highly fruitful for the participants, as well as lay the groundwork for similar such events in the future.

Thank You

Keynote Speakers



Dr. Branson Belle

Senior Research Scientist
Department of Sustainable Energy Technology,
SINTEF, Norway

Dr. Branson Belle is a Senior Scientist at SINTEF, Norway's largest research institute. He is a graduate of The University of Manchester U.K. where he completed both his undergraduate and PhD degrees. His PhD focused on magnetism in nanopatterned ferromagnets, specifically domain formation and switching field distributions. He is also a previous member of the condensed matter research group at Manchester, working under Sir Prof Andre Geim and Sir Prof Konstya Novoselov, 2010 Nobel laureates for their work on graphene. He has also spent time in industry, co-founding 2-DTech Ltd, a 2D material and device spin out and working as Director, Research and Technology insourcing for Thinfilm Electronics (Ensurge Micropower) ASA, a printed electronics company which developed printed temperature smart labels. His current research focuses on 2D material devices for sensing applications as well as multi physics Atomic Force Microscopy.



Prof. Dr. Zongyin Yang

Professor, College of Information Science and
Electronic Engineering, Zhejiang University, China

Zongyin Yang completed his B.S. in Mechanical Engineering at Zhejiang University, where he created many inventions and had been awarded first prizes in national mechanical and robotic design competitions. He moved to Cambridge in 2014 after completing his MSc and fellowship in Optical Engineering at Zhejiang University. Zongyin was among the 80 honourees to win a full scholarship for doctoral students at the University of Cambridge. He received his PhD degree in Electrical Engineering from the University of Cambridge in 2019. He was a postdoctoral researcher at the Engineering Department, University of Cambridge from 2019 to 2020. He was selected as a Research Associate (non-stipend fellow) at King's College, University of Cambridge in 2019. Zongyin is one of ten

individuals to be awarded the Extraordinary Potential Prize of the Chinese Government Award for Outstanding Self-Financed Students Abroad in 2019. He was the first extraordinary prize winner in the UK's engineering field in the past several years.

Zongyin joined Zhejiang University as Hundred-Talent Program Professor in September 2020. On account of Zongyin's outstanding contributions in the field of optoelectronics, he won Qizhen Outstanding Young Scholar Award and was also selected as 'Innovators Under 35, China' by MIT Technology Review in 2021. He got the National Science Fund for Excellent Young Scholars

Zongyin is dedicated to the miniaturization of full-spectrum light emitting and detecting devices. He has made valuable advancements in the field, including being the first to propose synthesis methods for bandgap graded semiconductors and developing the world's smallest spectrometer and widest wavelength-tunable nanolaser. Since 2010, he has systematically published 33 papers in the following top journals: Science, Nature Communication, Science Advances, Advanced Materials, and Nano Letters. Twenty of these publications have had an impact factor greater than 10. As the first author, Zongyin has published five papers: one research and one review paper for Science, two papers for Nano Letters and one for Journal of the American Chemical Society. Additionally, Zongyin co-published a book with Springer Publishing Company. He has authorized eight patents in China, applied for one patent in the UK, one PCT patent, and a number of patents for technologies under development. Furthermore, Zongyin has been invited to serve as a regular reviewer for major publications in the field of materials and optoelectronics, including Nature Nanotechnology, Nature Communications, and Science Advances, and as a guest editor for Frontiers in Chemistry and Journal of Physics D.



Dr. Atif Farid Mohammad

Chief Scientist Onriva Inc.

Artificial Intelligence Professor, Adjunct UNC
Charlotte @ University of Cumberland, KY

Dr. Atif Farid Mohammad PhD is an avid Artificial Intelligence researcher with a background in Cyber Security as well as Scientific Computing with a PhD degree in each aforementioned area from University of Quebec Canada and University of North Dakota in United States.

Dr. Atif teaches Artificial Intelligence and Machine Learning at UNC Charlotte and also associated with Squirrel Valley Observatory as NASA Research Scientist to study Near Earth Objects, such as asteroids and more.



Dr. Khurram Shehzad

Associate Professor
College of Information Science and Electronic
Engineering, Zhejiang University, China

Dr. Khurram Shehzad obtained his PhD in Materials Science and Engineering in 2011 from Beijing University of Chemical Technology. From 2011-2013, he was a postdoctoral fellow at centre for nano and micro mechanics, Tsinghua University. He Joined Zhejiang University as a postdoctoral fellow in 2014. Currently, he is working as an Associate Professor of Research at College of Information Science and Electronic Engineering. He is also adjunct faculty at Zhejiang University-University of Illinois at Urbana-Champaign Joint Institute and associated faculty at Zhejiang University-Hangzhou Global Scientific and Technological Innovation Centre.

Currently, he is also serving as President of Materials Science Society of Pakistan, Editor-in-Chief of the journal Materials Innovations, and the Associate Editor of the journal Applied Nanoscience (IF=3.6). He is the recipient of several awards including the International Young Scientist Fellowship from NSF China, Nanchang University Fellowship, CAS President Fellowship, and the Cultural Exchange Fellowship. His current research interests include 2D materials/Si hybrids for applications in energy, healthcare, and electronics.



Prof. Dr. Ghaus Bakhsh Narejo

Professor, Department of Electronic Engineering,
NED University of Engineering & Technology

Prof. Dr. Ghaus Bakhsh is currently serving as Professor at NED University, Pakistan's oldest Engineering University. He is a graduate of The Michigan Technological University, U.S. where he completed both his Masters and PhD degrees. His PhD is focused on magnetism in perovskite nanomaterials, specifically the structure-property behaviors. He is also serving as secretary of the Emerging Technologies Research Group at NED University, working under Prof. Dr. S.M. Usman Ali for their work on R.E. Microgrids. He has also spent time in WAPDA. His current research focuses on A.I based Microgrid optimization.



Prof. Dr. M. Mubashir Khan

Professor and Chairman
Department of Computer Science & IT,
NED University of Engineering & Technology

Dr. Muhammad Mubashir Khan is a professor of Computer Science and IT at NED University of Engineering & Technology, Karachi. He is currently serving as the Chairman of the Computer Science & IT department. He is a Co-Principal Investigator of the National Centre for Cyber Security at NED University. During his postdoctoral research in Leeds Quantum Information Group in 2015-16, he served as the Visiting Associate Professor at the University of Leeds, UK. He is proud to be a graduate of the Institute of Information Technology, University of Sindh Jamshoro, from where he received a MSc. Telecommunications degree with 2nd Position in 2001. He received an MS Computer Science & IT degree from NED University of Engineering & Technology in 2005. He received his Ph.D. degree from the University of Leeds UK in 2011 in which he investigated higher-dimensional quantum key distribution protocols. He has published several book chapters and research articles in renowned international journals and conferences. He has been awarded the Best Researcher Award in 2020 and 2021 from NED University. He was also awarded the Best Teacher Award in 2015 and 2017 by the NED Alumni Association of Southern California (NEDAASC). He is an HEC Approved Supervisor and currently leading several research projects with international collaboration in the areas of Quantum Key Distribution, Intrusion Detection, 5G Security, and, the Blockchain.



Shamim Rajhani

Managing Director and COO at Genetech Solutions

Shamim Rajani is the Managing Director and COO at Genetech Solutions, a technology company dedicated to providing End to End IT solutions and services to its Global audience. She is currently serving as Chair for P@SHA's Skill Development Committee. Shamim passionately works on projects related to Women Empowerment and some of her initiatives include CodeGirls, WomenInTechPK and Prowomen.



Dr. Rehan Ali Shah


Associate Professor,
Department of Computer Systems Engineering,
Faculty of Engineering & Technology,
The Islamia University Bahawalpur

Dr. Rehan Ali Shah have been associated with Department of Computer Systems Engineering, Faculty of Engineering & Technology, The Islamia University of Bahawalpur since 2009. He received a Doctor of philosophy (PhD) degree in Computer Science & Technology from the Zhejiang University, P. R. China in 2019. He did Master of Engineering (Information Technology) from Mehran University of Engineering & Technology as well as Bachelor of Engineering (Computer Systems Engineering) from the Same University. He is Associate Professor of Computer Systems Engineering at The Islamia University of Bahawalpur, Pakistan. He has one PhD candidate and Six MS students under his supervision. He has published more than 16 local and international research papers. He is also a regular reviewer of the renowned research journals. His research interests include Machine learning, Computer Communication & Networks, and Network security.

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Transition Metal Dichalcogenides based Heterostructures for Ultra-sensitive Environmental Gas Sensors

Branson Belle^{1,2}

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Abstract

The isolation of graphene has heralded a new class of material research in 2D materials. Due to their high mobilities, tuneable bandgaps and surface to volume ratios, 2D materials have shown promising performance as gas sensors. Moreover, heterostructures can further enhance sensitivity and other device properties. Details of heterostructure gas sensor assembly and adhesion between 2D materials will be discussed. Additionally, the performance of these gas sensors and their sensing mechanism will be presented.

Full-Spectrum Light Emitting and Detecting Based on Bandgap-Graded Materials

Zongyin Yang¹

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Abstract

Bandgap is one of the most critical parameters of semiconductor materials with regards to optoelectronic applications such as solid-state lighting, detectors, solar cells, displays and lasers, as it determines the spectral characteristics of the optical absorption, detection and emission. The limited available bandgaps of natural semiconductors has presented a major hurdle for optoelectronic applications. Alloying of semiconductors with different bandgaps, such as ternary and quaternary compounds, goes some way to addressing this. However, the synthesis of alloyed semiconductors is typically carried out such that an individual batch will only produce material of uniform composition. Bandgap-graded structures have recently emerged and attracted significant interest. Continuously variable bandgaps provide perfect ways to realize optoelectronic device with tunable spectral features. In this talk, I will present our studies on the synthesis and applications of bandgap-graded semiconductor materials. We invented two methods for the growth of bandgap-graded nanowires, where continuously variable bandgaps can be achieved along single nanowire in a single growth run. We developed the world's smallest optical spectrometers, as well as the smallest broadband tunable lasers based on these bandgap-graded nanomaterials.



Artificial Intelligent (AI) Enabled Modern Power System Designs for 21st Century Era: New Optimization Paradigms

Ghous Bakhsh Narejo¹

¹Department of Electronic Engineering, NED University of Engineering & Technology
Email: ghousnarejo@gmail.com

Abstract

The power system has evolved owing to its own dynamics and evolutionary needs arising from the modernization of the Generation, transmission and load anatomies. The development of the computational resources namely the hardware and the software, have contributed to the modernization of power system further. Nevertheless, the state of the art and the futuristic power design will be converging to the ongoing optimization using the traditional proprietary and the open source codes and the techniques of the computation. The open source software have been transformed in a major owing to the power system dynamics during the process of the optimization. The optimization techniques and the power system as well as the computational resources have to stand up to the challenges of the big data, real;-time changes in the power network as well. New techniques and the codes are necessity of time to attain the computational efficiency for achieving the reliability of the R.E. resources as well as the evolving loads.

A Taxonomy of Text Mining

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Abstract

With a rapid increase in the volume of textual data on the Internet, extracting useful information through innovative text mining techniques has become crucial. In this context, terminology jargon in the literature related to text-mining creates ambiguity and has made it very difficult for researchers to focus on a specific direction and bring innovation. For example, review mining and opinion mining may have different applications, however, from a technical perspective, they are very similar. In this paper, we propose a classification of the text mining terminologies from the perspectives of technical and text-mining processes. The classification is based on a comprehensive literature survey and analysis. This research study presents a clear classification of text mining terminologies based on technical and text mining processes to resolve the issue of terminology jargon. By utilizing the proposed classification, researchers will be able to easily choose a specific direction instead of diverging amongst similar research problems, thereby, driving innovation. Further, the proposed classification will help advance and improve the overall research progress in all text-mining related fields.

Comparative Simulink Analysis of Control Techniques for AC Voltage Controller In Terms of Harmonic Content

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Abstract

AC voltage controller is a power converter that can change fixed root mean square (RMS) AC voltage into variable root mean square (RMS) AC voltage with no change in frequency. AC voltage controllers can be fabricated by using the pair of antiparallel power electronic devices such as Thyristors, MOSFETs, IGBTs, TRIACs. In AC voltage controllers because of frequent switching of power electronic devices harmonics are generated which not only influences the performance of ac voltage controllers but also the quality of power gets affected when linked with the electrical system. The RMS value of ac output voltage is controlled by various controlling techniques. This work presents a comparative analysis of various controlling techniques for AC voltage controllers in terms of harmonic content. Various possible controlling techniques were simulated in MATLAB/Simulink and the harmonic content in output waveform results was compared. In most of the analysis performed on AC Voltage controllers, thyristors were used as power switches, while in this work MOSFETs have been considered as power switches due to their self commutation capabilities. The novelty of the work is developing best controlling technique for minimizing harmonic content.

Analytical Approach of Designing Passive Filter For SMPS Load

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Abstract

The use of switch mode power supply (SMPS) load such as computer, laptop, etc in residential as well as commercial areas give rise to harmonics pollution in the electrical power distribution system which causes the quality of power poor and the function of equipment connected to electrical system are affected. Many electrical appliances have SMPS design that characteristically draws a distorted current which flow back to input supply cause distortion in voltage waveform. To ensure the safe functioning of various electrical devices, there is need of the implementation of effective harmonics mitigating techniques. This paper proposed an analytical approach of designing the passive filter instead of trial and error or complex approach for harmonics mitigation. Simulation results show the attractive findings of proposed approach for harmonic mitigation with the improvement of power factor.



Stacked Auto-encoder and Meta-Learning based Heterogeneous Domain Adaptation for Human Activity Recognition

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Abstract

The field of human activity recognition (HAR) using machine-learning approaches have gained a lot of interest in the research community due to its empowerment of automation and autonomous systems in industries and homes with respect to the given context and due to the increasing number of smart wearable devices. However, it is challenging to achieve a considerable accuracy for recognizing actions with diverse set of wearable devices due to their variance in feature spaces, sampling rate, units, sensor modalities, and so forth. Furthermore, collecting annotated data has always been a serious issue in the machine learning community. Domain adaptation is a field that helps to cope with the issue by training on the source domain and labeling the samples in the target domain, however, due to the aforementioned variances (heterogeneity) in wearable sensor data, the action recognition accuracy remains on the lower side. Existing studies try to make the target domain feature space compliant with the source domain to improve the results but it assumes that the system has prior knowledge of the feature space of the target domain, which does not reflect real-world implication. In this regard, we propose stacked autoencoder and meta-learning based heterogeneous domain adaptation (SAMHDD) network. The stacked autoencoder part is trained on the source domain feature space to extract the latent representation and train the employed classifiers, accordingly. The classification probabilities from the classifiers are trained with meta-learner to further, improve the recognition performance. The data from the target domain undergoes the encoding layers of the trained stacked autoencoders to extract the latent representations, followed by the classification of labels from the trained classifiers and meta learners. The results show that the proposed approach is efficient in terms of accuracy score and achieves best results among the existing works, respectively.



Analysis of Online Engineering Education Under The COVID-19 Pandemic Jamshoro Sindh: A Case Study

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Abstract

This paper is a survey analysis based on Descriptive analyses techniques. The survey done by questionnaire on making use of online engineering education to express the extent. These samples are collected from 104 students of faculty of engineering and faculty of engineering technology, Mehran UET, university of Sindh Jamshoro Sindh respectively. This study performed a pilot experiment, using IBM SPSS- 22. Aim of this study to estimate the inspiration and feelings of students online learning. Pakistan has approximately 1.7 million students are enrolled every year in Higher Education Institutions (HEIs) across the country. Among many students have been selected in engineering field. a distant-learning environment rapidly accepted in worldwide because of the abrupt commencing of the COVID-19 pandemic. Indeed, the harmful mark has an impact on the worth learning of engineering student. The results are technically classified and interpreted to match the ground reality. Hence, conferring the opinions of engineering students faced hurdles during online-learning argued in this research. It is observed in this experiment low degree of association in all variables. The authors expectation in this paper, PEC, teachers, and students will be better well-skilled. Therefore, it will be usefulness in severe environment. Some significant factors measured such as technology awareness, learning space, pedagogical method, new theory, and laboratory courses should redesign for distant engineering learning. Thus, more study required reasons to build a strategic planning for the successful implementation of online learning and technology in education system as an optimistic step towards evolution and transformation. Conclusively, the PEC must formulate our education policy and program along the lines of our national interests and our history and culture.

Soft Robotic Actuator with Free Sliding Shape Memory Allow Wire

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Abstract

Shape Memory Alloy (SMA) materials are often used as an activation source for bending actuators as they belong to the class of high power density materials. SMA based soft grippers have good performances in grabbing objects with non-uniform shapes in contrast to their counterpart rigid grippers but their performance is restricted by the small stroke of the SMA wire

inside the polymeric matrix and it has also been described as having a low actuation speed, which is considered as a fundamental restriction to its use in a broader variety of applications. The heating and cooling time is the primary limiting cause for its low actuation speed[1]. In this research two types of actuators were developed, one of them was made in such a way that the cotton thread was inserted into the soft polymer and further connected to the SMA wire externally, and in the second type SMA wire, itself inserted into the soft polymer. After performance analysis of both actuators, a two-finger gripper was developed. The maximum bending angle of 44 ° at 4 sec recovery time was achieved using 160 mm SMA wire embedded in polymer matrix as free sliding wire and the gripper was demonstrated to be fit for grasping different types of objects weighing up to 5-grams.

Analysis of Hydrodynamic Loads on Offshore Structure Using Computational Fluid Dynamics

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Abstract

Offshore structures are very essential for the economy of any country. Many shallow-water jacket structures are utilized in oil exploration and production. Dominant loads in the shallow water depth are associated with offshore waves and currents. The numerical analysis of hydrodynamic loads under actual environment is carried out in this study. To account forces acting on the structure, a model of jacket platform close to actual one was used. Met ocean record of 10 years (Normal) and 100 Years (Extreme) for the south china sea offshore peninsular Malaysia was taken for numerical simulations. Flow analysis was carried out in numerical wave tank (NWT) with the help of commercial Computational Fluid Dynamics (CFD) software. Continuity equation and Naiver Stokes equations were used as the governing equations for fluid flow modelling. Special attention was focused for the geometry, meshing, solution setup, boundary conditions, convergence criteria, spatial and time discretization. Result of fluid flow is discussed for velocity vectors, forces, and pressure but they need to be verified from available literature and experimental work to validate the simulation outcomes.



Development of Piston Type Shape Memory Alloy Actuated Pump for Drug Delivery

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Abstract

The supply of drugs is of great importance for healing the disease. The blood sugar level of diabetic personal is required to be repeatedly observed, in accordance with level of sugar insulin be injected to wipe out surplus glucose. Treatment with injections is linked with soreness, contamination, injurious to body ornaments, training of a person to inject required level of drug is not possible. Miniature-pump is finding their rising application in the field of biomedical in particular drug delivery system based on various proposed techniques. Every actuation system for micro pump has their own advantages and disadvantages in terms of voltage applied and rate of flow of drug and algorithm effectiveness and complexity for controlled drug supply. SMA based actuator find their novelty as they required less voltage and provide better flow rate. This research proposes SMA wire actuator based pump for drug delivery system, a novel syringe shaped pump is developed with integration of SMA wires in loop configuration at edges of the syringe. The presented system will be able to discharge prefilled water upon actuation of SMA wire actuators with relatively simple mechanism and can be employed for delivering numerous type of drugs into human body.

Control System Design for Automatic Solar Panel Orientation for Optimal Energy Efficiency

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Abstract

In this highly revolutionized era of technology and automation, the power production is quite a challenge to meet. Today fossil fuels, petroleum, natural gas, and many other non-renewable sources are highly contributing to run the industries. As a result, declining rate for non-renewable sources is very fast, moreover non-renewable sources are primary sources of pollution and ozone layer depletion. For all these reasons, renewable sources are spotlight as a solution. One of the primary sources of which is "Solar energy." A clean way to produce electricity and also widely available all over the globe. To utilize solar energy more efficiently it is required to maximize its absorption. For this purpose, dualaxis solar tracking system has been developed that is capable of changing its orientation by following sun trajectory. It comprises of Sensor; which detects the solar radiations incident on photovoltaic cells and a

controller which is mainly responsible for the motion of the system to keep it perpendicular to sun. PV cells produce more energy in abundance during the daytime than required. Our approach is to develop a cost-effective design that will efficiently increase the performance with the additional benefit of a tracking system requiring low maintenance cost. Another focus is to design as simple as possible because complexities in design may ultimately result in reduced life of the system. Mathematical modelling for the system is performed at Matlab, developing the P and PID controller design to achieve stable system response. Finally a lab mock up is fabricated with LDR as sensors to test the calculations. This research paper includes a comprehensive study on Geographic data of location where a system needs to be installed, type of solar panel based on solar cell structure, and axis tracked. It also comprises of analysis of the efficiency of solar panels and includes a study on the different components for the construction of the system.

Impact of Software Metrics on Software Quality using McCall Quality Model: In-Depth Analysis

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Abstract

Software metrics plays a very vital role in life cycle of software development. Rapid software development techniques and tools have made it very complex to fully control the quality of a software. Software metrics are required to make sure that the quality of software is fully under control. Many software metrics have already been developed and applied to control the quality of software products. Software metrics is the measurement of quality in which performance is measured against quality standards to check whether they are according to the expectations. Quality metrics are also used to determine customer requirements into acceptable performance measures. This paper summarizes the concepts of software quality, quality factor model, mapping according to McCall Quality Model & the quality metrics. The act of applying software quality measurements to functional components and to keep up with factors is a mind boggling task. Effective software quality affirmation is exceptionally reliant upon quality methods. Future examination is needed to expand out and work on the approach to widen measurements that have been accepted on one venture, utilizing our rules, legitimate proportions of value on future software project. This paper also dives deep into the impacts of the various software metrics over different quality factors and explains the relationship between them.



Minimization of Power Losses of Distribution Network Considering Network Reconfiguration

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Abstract

Distribution system, which is dedicated to delivering power to an end-consumer, is a very complex section of the power system between transmission and utilization. The delivery of power from sources to end-consumers is always inherited by power losses due to unbalanced loads and growing demands. In this paper, distribution network reconfiguration (DNR) technique is used to minimize the active power losses. DNR is defined as shifting the position of sectionalizing and tie switches. During DNR, all nodes are energized in order to maintain radiality constraint (no loop). In addition to it, both voltage limit at bus and power flow constraints are considered. Moreover, a metaheuristic composite differential evolution (CoDE) algorithm along with a feasibility rule constraint handling technique is anticipated to obtain the best position of tie and sectionalizing switches. In order to find the superiority of proposed approach, various standard radial distribution test systems are modified to light, Nominal, and Heavy load levels. Furthermore, simulation results of CoDE are compared with current other optimization approaches and better performance of proposed algorithm is observed.

Economic Load Dispatch of IEEE-3 Units Power System Using Genetic Algorithm Optimization

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Abstract

Optimization techniques have been emerged as a powerful tool in solving real life engineering problems of the modern world. Economic Load Dispatch (ELD) is a well-known electrical engineering problem of running the power system economically. In a unified power generation system, the objective is to select the optimum values of power units within the specific ranges provided to achieve the desired solution of the minimization of the total cost by satisfying the system constraints. In this paper, optimization technique of Genetic algorithm (GA) is suggested to solve the ELD problem of 3-units power system. A study of three generating units having a maximum demand of load to be 850 MW along with valve-point loading effects is considered. GA



technique efficiently computed the optimum value of the power units and the minimum cost function of the three generating units along with satisfying all the constraints. The value of minimum cost acquired is compared with the minimum values acquired through the previous techniques. The results show the superiority of the proposed technique.

Systematic Review and Usability Evaluation Covid-19 Mobile Applications in a Developing Nation

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Abstract

Mobile phone technology made tremendous progress today. In this current ongoing Coronavirus disease (COVID-19) pandemic situation worldwide, mobile phones have an essential role due to its number of applications. To save lives through proper guidelines and information, it is necessary to retain the people up to date. That's why well-needed applications are required that aim to decline the rampant increase of COVID-19 cases country-wide. Today with the increasing pandemic Covid-19, several applications have been developed to inform people about safety measures and keep them updated with the public health measures. COVID-19 applications relate to large public, hence, usability of these applications has far larger impact than any other type of applications which generally have a specific user group. Therefore, in this article, a systematic review is taken by considering their range of functions, target user groups, name, languages, size, user ratings, available interfaces, response time, release date, up-dating date and up to date cases. There exist several methods for evaluating usability. In this work, we use user-based usability evaluation methods to explore usability issues in COVID-19 apps. By performing analysis on the extracted data, we examine some facts like the impact of gender on usability, impact of age, usability dimensions, and the effect of app functions on usability to see whether they affect usability positively or negatively.



Parental Engagement in University Student's Online Learning During Covid-19

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Abstract

In this paper, we have focused on the students learning behaviors during COVID-19 and assessed the parent's contribution in uplifting their children learning attitude. A data from 400 respondents from different educational institutes have been collected and processed for data analysis using SPSS. Initially, we assessed the consistency of the questionnaire and found it better. Later on we computed some summary statistics and observed that most of the questions showed normality. On the basis of results of chi-square, it has been observed that the parents with high qualification facilitated their children during the online learning. Provision of high speed internet. Educated parents assisted their children in time management to show positive attitude in online learning. They motivated their children in changing the behavior towards online learning and supported financially in purchasing the online learning equipment's.

Investigating Wing Rock Phenomenon at Low Reynolds Number for Micro-Aerial Vehicle Applications

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Abstract

This research is based on the investigation of wing rock phenomenon in micro aerial vehicles and aircraft. Wing rock is a nonlinear phenomenon which affects flight control and stability. Many methods for the suppression of wing rock have been developed by researchers over the past years. In the present study, a detailed overview about wing rock has been presented followed by causes of wing rock and its effects in flight control and stability. Also, various methods are presented and analyzed from previous studies, which can easily suppress wing rock phenomenon effectively. Some of these methods require modifications in wings and use of vortex flaps to eliminate limit cycle oscillations, whereas other methods use controllers for suppression. A detailed analysis has been done and best methods have been selected which can eliminate wing rock based on their



results and accuracy. Such proposed methods if employed on modern day micro air vehicles, will be able to effectively reduce wing rock oscillations at high angle of attacks at low Reynolds number flight regimes.

Exploring and Assessing the Trivial Compiler Equivalence

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Abstract

Mutation testing is the state-of-the-art technique to assess the fault-detection capability of a test suite. However, its adoption in industry is deterred by few of its inherent limitations including the equivalent mutants. Since the equivalent mutants are functionally similar to the original program, the test suite can not kill them, hence they produce false alarms for the developers and reduce the mutation score. Although to automatically verify whether or not the mutant is equivalent to the original program is undecidable, yet there exist heuristics such as trivial compiler equivalence to automatically eliminate sufficient equivalent mutants. In this paper, we explore the use of compiler optimizations at assembly level code to detect equivalent mutants and find that it can indeed detect equivalent mutants.

Improved Aerodynamic Design of Passenger Car for Low Power Consumption

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Abstract

In this research, we intend to provide an innovative and ingenious aerodynamic design for a fuel-efficient passenger car that consumes low power and provides greater efficiency and performance. Fuel used by cars mostly is petrol, diesel, and electricity etc. Almost 80 % of the world's cars and automobiles are running on fuel obtained from natural resources. According to research, natural resources are depleting at a very high pace and by the year 2050, we might run out of natural fuels altogether. To reduce the usage of fuel, the efficiency of a car can be increased by improving the design of the car. When we talk about passenger car aerodynamics, drag is a critical factor that cannot be ignored, which is a significant component contributing to the consumption of fuel. Drag is a force that acts in the direction opposite to the motion of the car. At high speeds, about



50% of the car's fuel is consumed to overcome the drag. By reducing drag, we can not only reduce fuel consumption, but also can improve stability, achieve high speed, and indirectly reduce global warming. The skin friction as well as the pressure difference that exists due to the flow separation at the rear end of the car, both generate drag in the passenger car in low subsonic incompressible regime. In the last three decades, significant research has been done to reduce the drag of passenger cars. Drag coefficient (CD) can be decreased by reducing the weight of the car but this technique is not an effective approach, as 0.003 of CD reduction can be achieved by reducing 10-15 kg of a car. Therefore, 'Passive' (add-on devices and topology modification) and 'Active' (steady jet flow) control techniques are mostly used to minimize drag. Some common techniques are hence the use of spoilers and diffuser plates. In our proposed work, Solid works was used for CAD followed by computational fluid dynamics (CFD) analysis using ANSYS. Results of drag coefficients were thus obtained, which were compared with the original clean design. It was found that vortex generator and diffuser were useful add-on devices, that resulted in a 3.6 % reduction in coefficient of drag and 1.8 % reduction in fuel consumption.

Innovative Application for Monitoring Child Behavior Using Play Therapy

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Abstract

Devices such as cell phones, tablets, laptops, etc., have become children's material support when parents neglect them. Without emotional support, and little parental guidance children will eventually suffer from insecurity, depression, and anxiety. Thus, to bridge this gap called emotional detachment between parents and their children, this research will introduce an android-based application called Child Psychology Monitoring and Learning System (CPMLS), which is designed to assist parents in monitoring their child's psychological state. It is designed for children between the ages of 3-9 years and is grouped into three categories, i.e., 3-5, 6-7, and 8-9, respectively. Within this application, various digital games will test the child's emotional and social intelligence using play therapy. As a result, parents can keep track of what their child is experiencing on a psychological level.



Smart Surveillance and Detection Framework Using YOLOv3 Algorithm

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Abstract

In this paper we proposed a method for locating, identify and admit the activities of intrigued, in nearly actual time from outlines gotten by a ceaseless tide of video information from an observation camera. This article prescribes the path to trace, identify, and notice the activities of intrigued, in nearly real time from outlines gotten by a nonstop stream of video information from a reconnaissance camera. The show takes input outlines after an indicated time slot and can provide an activity name based on a single outline. We illustrate that YOLO is a viable strategy and comparatively quick for localization within the custom dataset. The findings and analysis of the model will be presented in the sections that follow. The model collects input frames after a predetermined interval and can assign an action label based on a single frame. We projected the action label for the video stream by combining the findings over a period. Because of its benefits, this YOLO method is used to identify activity. This method may be used in a variety of settings to tackle real-world problems, such as shopping malls, ATM machines, banks, offices, homes, and societies. We've developed a model that detects some ideal human actions.

Framework of Car Price Prediction and Damage Detection Technique

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Abstract

In this paper, the research area has always been car price forecasting, we demonstrate that by using the proposed object detection method, the type of damage can be categorized into 2 classes with good accuracy damage and undamaged. So, when we discovered these issues, we decided to develop a mobile application called Car Price Prediction, which allows users to simply anticipate the price of a used car. So, we trained the damage identification model using our data using a state-of-the-art image detection method convolutional neural, and evaluated the accuracy on GPU server and a smartphone.

Significance and Challenges of Big Data in Healthcare: A Review

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Abstract

The last decade has witnessed a boom in the broadening of data in the sector of healthcare. The rampant digitization of data is piquing interest of researchers in healthcare. In this paper, we have reviewed the significance and the challenges of big data in health care sector. We have discussed the characteristics of Big data i.e, Volume, Veracity, Velocity, Variety and Value. Big data has impacted the healthcare in almost all dimensions. The significant effects are left on diagnosis, telemedicine, medical research and improving the healthcare of patients. This significance bring various challenges such as accuracy, security and privacy, storage and processing, skills and expertise and big data analytics. This paper aims to explore more applications of big data in healthcare and highlight the challenges faced in this sector.

Advancement in Internet of Things (IoT) & Its Notable Influence in the Health Sector

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Abstract

Healthcare expert systems need assistance in attaining quality and time-efficient results with the help of latest technological advancements. This is possible by implementing effective modern techniques and procedures capable enough to reduce cost and time This study focuses on finding ways that imply best hardware and software tools for providing healthcare solutions. Attaining quality of healthcare services while developing an autonomous system marks tremendous importance in health sector as it contributes in improving the performance of a product and making a medical gadget as smart as possible. This is achieved when we have some idea similar to ubiquitous computing. The outcomes from the background study reveal that numerous IoT based applications are available for enhancing the efficiency, performance, interoperability, reliability, security and much more with the implementation of e smart gateways, fog assistants unobstrucious sensors software testing attributes. It proposes a solution for handling large data, security implications and resource usage in an efficient manner using key features of IoT.



A combined analysis on evolution of IOT in healthcare sector provided by some related review papers is presented. It is concluded that IOT based devices serve bigger and better as an aid to patients in medical treatments with large variety of devices for their comfort as compared to normal hospital appliances. The study suggests some points for future research as well.

Electric Vehicle Mechanical Brake System Control

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Abstract

The limitation of driving range is the key restriction for the development of electric vehicle, and regenerative braking is an effective approach in order to extend the driving range of an electric vehicle. Regenerative braking is an approach for electric vehicles to increase their operating range. Regenerative braking is essential for maintaining the vehicle's strength and obtaining more energy. For deceleration, electric vehicles employ a mechanical brake to increase the wheel's roughness. However, in terms of energy conservation, the mechanical brake wastes a lot of energy, whereas the kinetic energy of the electric vehicle is recycled into thermal energy. Typical braking methodology wastes a lot of energy by producing unneeded heat while braking. The development of regenerative braking has overcome these drawbacks, as well as saving energy and increasing vehicle's economy. During this process, large charging current results in breaking of batteries and in order to overcome this issue and to make the charging current as a control object, a control strategy has been proposed in this paper. To ensure the robustness of the closed-loop system under the presence of uncertainties like parameter perturbation and unknown model dynamics, and to minimize the effect of disturbances such as the variation of the voltage of battery, state of the road and the driving profile of vehicle etc., controllers have been designed with maximum efficiency in order to overcome all the disturbances. The use of PID controllers and hence reducing the system characteristics including settling time, peak time and percentage overshoot ensures the maximum output of the braking system used. This proposal approach will help to achieve a higher efficiency of the electric vehicle system and provide a low-cost driving experience. It will impact on designing better electric cars to be used more often. As the electric vehicles are a step towards an emissions free world so if they are adopted by more people, and get replaced by the fossil fuels consuming, they will make a mark on the sustainability of the environment.



Automatic Control of Molten Steel During Continuous Casting

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Abstract

In continuous casting desired shapes are created by introducing molten metal into an existing horizontal or vertical mold that has the ability to rapidly cool molten metal to a point where it solidifies. By this process a fine, uniform grain structure in metal is produced, the structure produced by using this method has higher physical properties as compared to sand casting. As we know that in continuous casting we achieve very fine quality of product as compared to sand casting but during the actual process we sometimes face defects in the final product when we are doing continuous casting. Defects in the continuous casting products are identified by their visual inspection when they are on cooling beds or by checking the chemical composition of test sample in laboratories. We can come across many defects in our final product such as (1) surface defects, (2) internal defects, (3) shape defects, (4) mechanical defects and (5) deviations from the prescribed chemical composition of steel. In this paper our main focus will be the study about continuous casting in steel production and figure out some ways to avoid the defects in our final product. Every industry tends to achieve better quality products and to make a product that is more precise and have minimum defects in it. The significance of this study is to make improvements in continuous casting products by using controls system thus avoiding as many defects as possible in order to produce much accurate and cheaper product.

Digital InEqualities in E-Learning towards University Students of Hyderabad amidst COVID-19

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Abstract

Due to the COVID-19 Pandemic, university campuses all over Pakistan were forced to shut down by March 2020 and students were obliged to continue their studies online via remote learning. This study focuses on examining the remote learning experiences of the students of Hyderabad, which being a city of Pakistan's second largest populated province, has students coming from multiple rural areas for the purpose of education. It focuses on whether the students of Hyderabad universities have been able to cope with remote learning or suffer from digital inequality due to unfamiliarity with computer usage and lack of technology access. An anonymous online survey was used to gather 124 samples all over Hyderabad during May 2021. The survey focused on various online learning factors and if the students suffered digital inequality due to them. The data



was analyzed using Structural Equation Model with standardized errors and significance values. A Multiple Regression model was also applied for Hypothesis testing. Pie charts and Bar charts helped clarify the structure of the responses. The findings of the Analysis revealed that while students had been able to cope with digital unawareness by self-learning, the Remote Learning Proficiency of the students suffered due to infrastructure expenses. It was found that students with computer training in the past did not necessarily perform well in remote learning. Students also suffered due to the continuous change in online learning policies via their universities. Multiple social factors such as situations with studying from home affected the study of the students as a study-life balance was not established. Students preferred their universities to have their own Online Learning Software that could cater to their specific needs. They also preferred Physical classes over online classes with the exception of assessments to be conducted online, which suggested that students prefer open book examinations and interactive classes. This report considers it significant to ensure a study-life balance, self-learning, free extra sessions, relaxed-time periods by institutes for assessments and maintaining a single policy for all institute's assessments to be key for affectivity in online classes to ensure equality among the learning process of the students, so that if the students lacks in something, they might be able to cope up with relaxed time periods and extra classes.

An Expert System for Weapon Identification and Categorization Using Deep Learning Technique to Retrieve Appropriate Response

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Abstract

In response to any terrorist attack on hospitals, airports, shopping malls, schools, universities, colleges, railway stations, passport offices, bus stands, dry ports and the other important private and public places, a proper plan will need to be developed effective response. In normal moments, security guards are deployed to prevent criminals from doing anything wrong. For example, someone is moving around with a weapon, and security guards are watching its movement through closed circuit television (CCTV). Meanwhile, they are trying to identify his weapon in order to plan an appropriate response to the weapon he has. The process of manually identifying weapons is man-made and slow, while the security situation is critical and needs to be accelerated. Therefore, an automated system is needed to detect and classify the weapon so that appropriate response can be planned quickly to ensure minimal damage. Subject to previous concerns, this study is based on the Convoluted Neural Network (CNN) model using datasets that are assembled on the YOLO and you only see once. Focusing on real-time weapons identification, we created a data collection of images of multiple local weapons from surveillance camera systems and YouTube videos. The solution uses parameters that describe the rules for data generation and problem interpretation. Then, using deep convolutional neural network models, an accuracy of 97.01% is achieved.

Evaluation Similarity of Attack Intention (SAI) of Cyber Crimes for Network Forensics using Dempster–Shafer (D-S) - Artificial Intelligence (AI) Algorithm and Management System

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Abstract

Network forensics is an important aspect that helps in the collection, analysis, categorization, and the presentation of digital or cyber evidence. Modern cyber offenders are using sophisticated tools and technologies, which makes it difficult for cyber forensics professionals to detect the attacks. Network forensic analysis is an essential concept that makes it possible to identify the intention of attackers. Performing attack intention analysis plays a significant role that helps to accelerate the pace and improve the accuracy of network forensic process. Considering the large amount of data in the cyberspace, the existing tools for performing attack intention are faced with various challenges. They are not only error-prone but also do not guarantee a high degree of efficiency. It is thus essential to consider the implementation of an intrusion detection system that can guarantee a high degree of efficiency in relation to attack intention analysis. In this paper, a novel approach for estimating similarities in attack intention analysis is proposed. The new algorithm, DS-AIA will be based on the functional principles Dempster–Shafer (D-S) and the AI algorithm. DS-AI is expected to use evident fusion for enhancing the ability to detect attack intentions from the collected evidence. The analysis of the performance behavior of an intrusion detection system implemented using the new algorithm. The performance evaluation is assessed using four different network traffic analysis benchmarks (TP, FP, DR, and AR). The training data is obtained from KDD CUP 199 data set with four classifications based on URL, email, cookies, and browser cache. The performance of the new algorithm is evaluated and assessed against AIA and SIA. The experimental results indicate that DS-AIA performs well in terms of AR accuracy when compared to the other algorithms. The results indicate that the proposed algorithm is provided a higher accuracy in terms of identifying the similarities in attack intentions and thus should be utilized in network forensic processes.



Software Quality Optimization of Coordinated Continuous Integration Tools And Techniques Using Agile Development Environment For Mobile Applications

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Abstract

Software Quality Assurance (SQA) upgrade its arrangement of specialized reports on the estimation of the quality of software products (ISO/IEC 9126), in an agile development environment, the ISO/IEC 9126 standard has been made to address software quality issues. The Continuous Integration (CI) is an agile software development practice which focuses on code integration and automation of the development process. Continuous integration combines the work of multiple developers at most of mobile companies and is usually done at least daily to help detect any bugs early and to reduce the effort and cost, automated continuous integration tools for mobile Application plays vital role in software industry. To many automated continuous integration tools are available hence selecting the appropriate tool is difficult in this research, we proposed a quality framework to select an appropriate continuous tool. A case study has been chosen two automated tools Jenkins and JIRA to evaluate the differences between the metrics of each quality factor are provided, first, theoretically, and then the measured results of the software quality attributes in the framework are presented. Finally, we comparison of the software quality between the results before and after applying the continuous integration practices is provided by the Agile development and ISO/IEC 9126 quality model is Usability, Testability, and Portability which are highly effected quality attributes of both models.



Experimental Implementation of Robust ANFIS-PI Based Hybrid Controller for DC Motor Drive System

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Abstract

This paper presents experimental implementation of a robust Adaptive Neuro-Fuzzy Inference System-Proportional Integral (ANFIS-PI) based Hybrid Controller (HC) for dc motor drive system. Conventionally, PI controllers are extensively used for control of dc motor drive system. However, because of inherent working mechanism of PI controllers they suffer from significant overshoot and settling time. Some industrial applications require accurate, fast and stable response of the dc motor drive system. To completely eliminate the overshoot, concurrently, to improve settling time the HC (combination of ANFIS and PI) is presented in this paper. The proposed control scheme is simulated in MATLAB/Simulink. Also, it is experimentally implemented using DS1104 R&D Controller Board from dSPACE. For fair comparison, PI controllers are properly tuned using ControlSystem Designer tool available in MATLAB to get best possible response. Obtained experimental results show that, PI controllers have significant overshoot, i.e., 25.5% and settling time 1.80 sec. Whereas, proposed ANFIS-PI based HC outperforms PI controllers by giving 0% overshoot with 0.08 sec settling time, with identical operating conditions, thus making it suitable for industrial applications.

Intelligent Outdoor UAV Surveillance

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Abstract

The Unmanned Aerial Vehicles (UAVs) nowadays have vast applications for both civilian and military purposes. The ability of UAV to carry multiple sensing equipments makes it suitable for many fields in which surveillance is important. UAVs allow for a quick and inexpensive operation when compared to traditional methods used for surveillance applications. The present research is based on building a quadcopter and using onboard Arduino Mega 2560 micro- controller along with multiple HC-SR04 ultrasonic sensors for obstacle avoidance by implementing Sense and Avoid algorithm, equipping it with an analog FPV camera for obtaining live video feed with minimal latency, providing headcount at a specified location and to track a particular person, automating the quadcopter and collaborating it with the Unmanned Ground Vehicle (UGV) in order to make surveillance and security efficient. The research also encompasses the development of a Ground Control Station (GCS) with a map. The communication between quadcopter and the GCS is established through MAVLink (communication protocol for drones).

A Review on Cryptography Techniques and Algorithms and Secure Communication

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Abstract

The rapid increase of the sharing of the various types of the data in digital era is a common and emerging trend. The sharing of information is vulnerable to various active attacks as well as passive attacks. In these conditions, the information security is a concern and top at the priority of any organization. The well-established standards and the solutions provided to share information in secure manner by using cryptography techniques especially in the field of communication. The evolution of the encryption methods and algorithms have seen a drastic change from the easy to difficult and complex methods based on the mathematical and statistical calculations. The mathematical analysis, probability and statistical calculations ensure that the communication must be secure and free from stealing, hacking and other theft or alteration of the data. However, cryptography has long way to perfection as many of the attacks and vulnerabilities are still on way. This paper discusses on the various aspects of the attacks, handling algorithms, classification of algorithms and other aspects of the cryptography and related terms.

Analysis Quality of Malicious URL Using Machine Learning Techniques with Cyber Security

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Abstract

Nowadays, the Web is a basic and most impotent part of the common reality of various entities. Malicious URL is the most common security problem in cyber security. Malicious URLs host unwanted content which may lead to phishing, spam, and virus and can affect the computer system. It is basic to distinguish and follow up on such dangers in an opportune way. Generally, this location is done for the most part using a blacklist. Machine learning techniques are frequently has been used to solve this problem in this research paper. So, there is a need for researchers to compare different machine learning techniques to analyze quality and accuracy performances and reliability of different rules and techniques to facilitate different researchers and organizations to know about their performances and prediction accuracy result. According to this research compared different machine learning techniques analyzed quality and accuracy performance and reliability of different techniques.



Towards the Optimal Use of Machine Learning Algorithms in Text Mining: A Quick Review

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Abstract

This paper aims to provide a quick review to jump-start the research in the field of text mining where Machine Learning (ML) algorithms have been used and several accomplishments have been reported by the research community. There are different categories of text mining, and the implementation of ML algorithms and techniques have been supported in the literature to give promising results. However, in this area of study, most of the research activities in terms of time and efforts are consumed during the initial stages where implementations and experiments are carried out to evaluate various combinations. The accomplishments in this field can be further advanced by presenting early investigations concisely and analytically. Thus, the benefits of this paper are threefold: first, it will provide a platform for the new researchers to start quickly with a shorter literature review and knowing more precisely about the combinations of text mining and ML; secondly, clear analysis has been presented about the text mining categories where the performance of ML algorithms have been reported successful; and lastly, the problems have been identified for which the algorithms were used in various studies. This will enable the new researchers to directly target the problem instead of implementing the existing techniques. With the help of well-structured questions, the results are more analytical and present multidimensional views to this research issue. Main findings include that ML has been widely used in document classification and Support Vector Machine (SVM) is the most successful algorithm reported.

Information Retrieval Model for Semantic Search from Holy Quran Text Interpretation – A Proposed Model

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Abstract

Semantic Search is a data-mining technology in which a query-based method intends to obtain appropriate results from a dataset by assessing and analyzing the search words. Semantic search is based on the semantics of language. Information retrieval is the study of obtaining retrieved data in form of text or file from such a related database relying on a query string. This research

concentrates on how to use Information Retrieval (IR) with Semantic Searching (SS) strategies to retrieve relevant information from the Holy Quran and Hadith through cognitive theories, with Hadith, Tafseer (Quranic Exegesis), and multilingual interpretations. Further for keyword research, the method of obtaining a retrieval profile model for each query requested by the user. A proposed method for a web application will be developed based on the semantic search methodology of the IR technology, which is used to find relevant information from the Holy Quran text and Hadith in correlated semantics.

Network Analysis Of 500 Flights of USA Air Transportation System

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Abstract

People's interest in network analysis has grown considerably in last decade. The air transportation network is considered to be a complex network, full of vitality and ramification. The main purpose of this research is to model and analyze, from a network perspective, the US air transportation network, which is one of the unique in its nature in the world. We find several features of complex network of air transportation including local and global such as degree distribution, weighted degree, clustering coefficient and betweenness and closeness centralities. The USA air transportation network has shown small-world behavior and due to non-homogenous distribution of applied network analysis metrics the network is inclined to power-law distribution.


Analysis of the factors affecting online teaching during Covid-19

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Abstract

The current study aimed to analyze the effect of student participation, teachers' skills and strategies, teacher training, teaching domain, and teaching perception on the effectiveness of online teaching while considering the challenges of online teaching in the context of the Covid-19 pandemic. To evaluate the suggested model of the study, primary data was obtained via emails from academic staff in Pakistan using a questionnaire survey. SmartPLS (v.3.3.3) was utilized to examine the model in this study using structural equation modeling. Students' engagement, teachers' abilities and techniques, teachers' training, teaching domain, and teaching perspective all have a considerable beneficial effect on the success of online teaching, according to the current study's findings. As a result, this study suggests that institutions should concentrate on the needs of academic staff in order to improve online teaching effectiveness.



1D, 2D and 3D Displacement Sensor's Design Techniques using Polymer Fiber and Applications

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Abstract

In early ages, Fiber-optic is used for communication purpose but with the passage of time it is also being used for sensor. A lot of new sensor design techniques are being reported every year having some merit and demerit. Based on Fiber-optics, a wide range displacement sensor with cost effective is still a challenging task. We have developed several design techniques for displacement sensor relaying on polymer optical fiber. The sensors technique is based on side-coupling method in which light is being coupled from one fiber to another fiber. The developed displacement sensor contains simplicity in design, low-cost and wide range, and the range is achieved up to 1000 mm. Beside enlarging the range, two-dimensional and three-dimensional (2-D & 3-D) are also developed as the dimensional sensors. Our design sensor used in geotechnical application to measure the water displacement in sandstone. In the laboratory condition, the water displacement is based on the surface detection as water rises. In the experiment, the water was displaced up to 12 cm in the sandstone. The designed sensors are simple, easy to fabricate, flexible and low-cost in comparison with the other methods.

Solving Food Wastage issues through BYOD application

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Abstract

Food Wastage is a rising challenge at the global level as 1.4B hectare of land is occupied by wasted food. If annual 1/3rd of wasted food is donated to undernourishment areas, it will result in overcoming food shortage issues. Findings of previous researchers have identified that 49% of food is wasted in households and 20% of food wastage is due to mishandling of best before date. This research fills the gaps by a BYOD (bring your own device) application named ConFood, that can help reduce or eliminate the food wastage by reminding the user about best before date. It also includes a customized alert system, adding family members, BYOD support, recipe suggestions and similar others. The complete framework has been provided to develop the application.



Genetic and XOR Algorithms for Data Encryption & Decryption for Cloud Computing

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Abstract

Now a day the cloud computing is a large space for storage which can be accessed and used through the internet form anywhere. The concept of cloud computing to facilitate the peoples for their personal usage or corporate usage which is easily sharing data from one machine to another machine, there are four types in cloud computing Public, Private, Community and Hybrid computing. According to researchers and developers developed methods and algorithms to protect data from the hackers but they failed to stop them from the stealing data. In our research we developed a technique which encrypt the important data and protect it from the hackers we are using two methods XOR and Genetic algorithms to generate the key and encrypt the file process and protect it. We have also other encrypted algorithms that are used for data security like AES, DES and 3DES which are symmetric algorithms but we developed XOR and Genetic algorithms for encryption the data on a cloud.



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