1st International Conference on Recent Advances in Computing, AI and Data Science

(CAIDS-2023)

November 23-24, 2023
Riphah International University, Islamabad.

BOOK OF ABSTRACTS

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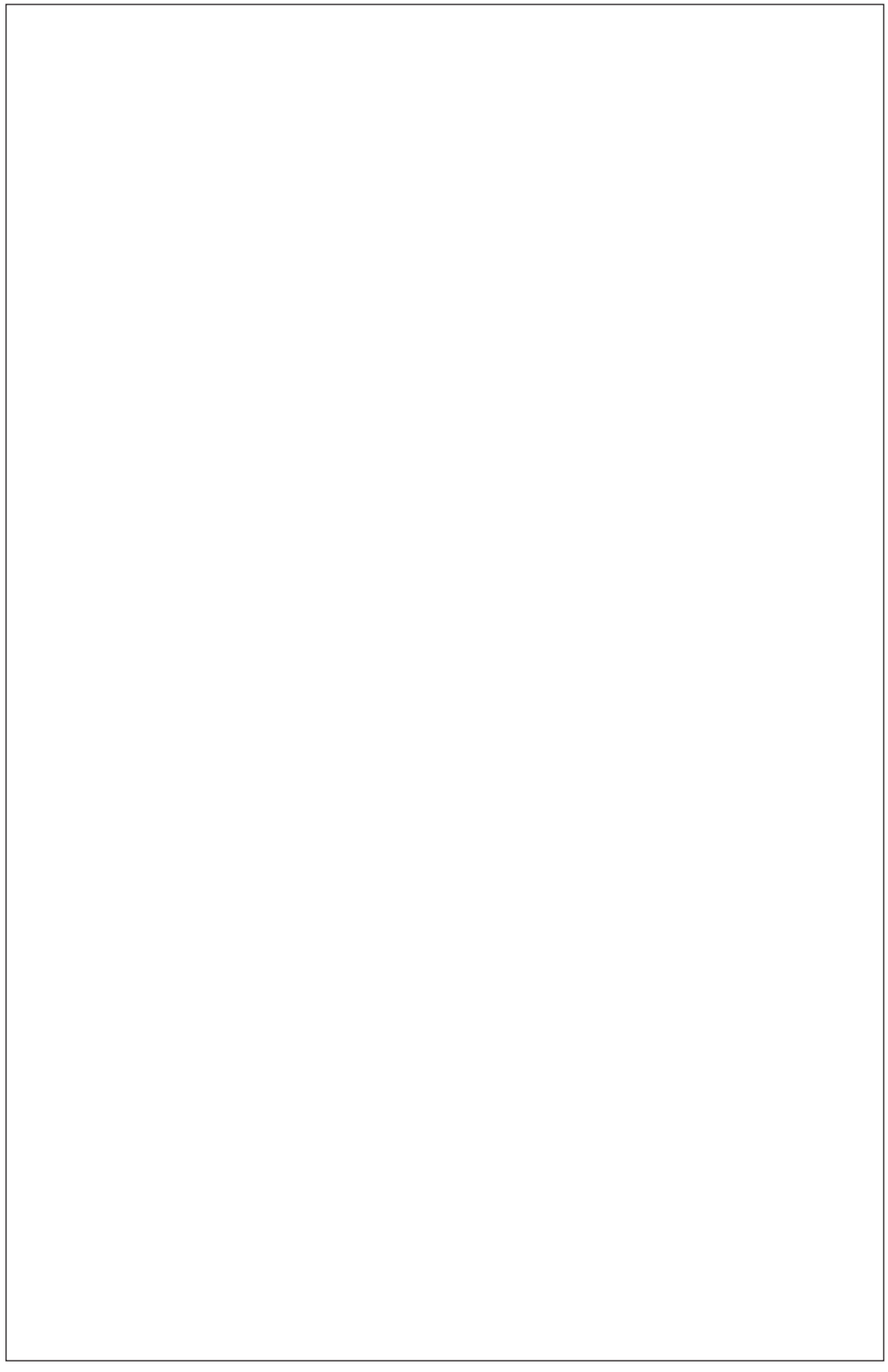

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INTRODUCTION

The Institute of Computer Science and Information Technology (ICS&IT), University of Science and Technology Bannu (UST Bannu), Faculty of Computing (FC), Riphah International University Islamabad (RIU Islamabad) and Multimedia University Malaysia (MMU Malaysia) are hosting a two-day International Conference on Recent Advances in Computing, AI and Data Science (CAIDS - 2023) at Riphah International University Islamabad on November 23-24, 2023. CAIDS-2023 provides an excellent platform for researchers and scholars from all around the world to share their research findings on recent advances in the fileds' of Computing, AI and Data Science. This joint venture by UST Bannu, RIU Islamabad, MMU Malaysia, Gomal University DI Khan and Brains Institute Peshawar will help promote communication and collaboration among the academia, industry and government. This conference is financially supported by the Higher Education Commission of Pakistan.

This conference aims to provide an excellent platform for scholars who are interested in the most recent advancements in Computing, AI and Data Science to share their discoveries and achievements. This initiative aims to promote improved communication and collaboration among researchers. It provides a platform for academia, industry and government to explore different dimensions of these exciting concepts with an emphasis on practical steps taken in Pakistan.

We welcome you and hope that you enjoy this two-day conference fruitful and entertaining at Islamabad.

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UST Bannu.

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ABSTRACTS

Mitigating Challenges in Data Science Projects

Prof. Dr. Choo-Yee Ting
Multimedia University Malaysia

This talk highlights some of the crucial challenges faced by industries when running, deploying and maintaining data science projects. The presentation begins with some of the dilemma in managing data science projects, particularly looking at the ROI. Subsequently, the talk highlights the differences between data analytics and data science, from which it proceeds to detail out the different types of intelligence when deploying a data science project. The talk then presents how performance could be evaluated and measured, objectively. Finally, the presentation ends with recommendation what role can a university play in collaborating with an industry when running a data science project.

Potential Impact of Digital Twins in Pakistan

Prof. Dr. Muhammad Tariq
FAST NUCES, Islamabad Pakistan

This talk will outline the transformative impact of digital twin technology in Pakistan across urban planning, industrial optimization, agriculture, healthcare, infrastructure, education, energy, and water resource management. Digital twins facilitate the creation of smart cities, optimize manufacturing processes, enable precision agriculture, improve healthcare delivery, enhance infrastructure resilience, support education and training, and contribute to a more efficient energy sector. However, successful implementation necessitates a strong technological infrastructure, data security, and skilled professionals. Collaboration between public and private sectors, academia, and technology providers is essential for harnessing the full potential of digital twins in Pakistan.

Software Engineering Landscape in the last Decade

Prof. Dr. Sajid Anwar
IMSciences, Peshawar Pakistan

Emergence of Machine Learning (ML) as the epic center of computational research in last decade has now widened to all phases of system development life cycle from requirements to maintenance and from planning to continuous improvement. This widening of scope for ML has led to extended and improved development and application of intelligent tools for automatic extraction of information from different documents, identification of functional and non-functional requirements, and test suites etc. With the swift progressions in ML and artificial intelligence, use of ML-based techniques and methodologies for software engineering are introduced and further optimized for greater efficiency of software engineers, processes and the product. From requirements to test cases, and from architecture to documentation, the ML artifacts and tools are now being employed. Therefore this talk will provide a brief overview of how Software Enignering Landscape has changed as a result of emergence of Machine Learning.

Beyond Traditional Learning: How AI is Reshaping Resilient Educational Practices

Dr. Rehman Ullah Khan,
Universiti of Malaysia Sarawak, Malaysia

This topic conducts a comprehensive analysis of the profound alterations brought about by artificial intelligence in the landscape of education, surpassing traditional learning methodologies. Through an intricate examination of advanced AI applications, we meticulously explore and elucidate their pivotal role in the restructuring of educational practices. Emphasis is placed on how these AI-driven transformations contribute to the cultivation of resilience within academic frameworks, marking a significant departure from conventional educational paradigms.

Vision Horizon - A Voyage from Computer Vision to Robot Vision

Saima Sultana[1,2], Sadia Nazim[1,3], Hira Beenish[4] and Mazliham Mohd Su'ud[5]

[1]Malaysian Institute of Information Technology,
University of Kuala Lumpur, Malaysia

[2]SZABIST University, Gharo Campus, Pakistan

[3]Bahria University, Karachi, Pakistan

[4]Karachi Institute of Economics and Technology, Kar achi, Pakistan

[5]Multimedia University, Malaysia

saima.sultana@s.unikl.edu.my, sadia.nazim@s.unikl.edu.my,
hira@kiet.edu.pk, mazliham@mmu.edu.my

The current study finds and sufficiently presents initiatives to curtail the computer and robotics vision gap. In recent times, computer vision has made great leaps towards understanding of visual learning of the world. This study presents efforts towards bridging this gap between computer vision and robotics vision. The current study brings out the technological advancement for processing intelligent visual perception with their limitations of vision together. It describes the transformation of perception and action essentially covered with their applications. A perfect combo of chronological transformation among techniques about vision and applications together can lead to more effective novel solutions for the classical problem of visual navigation. The current study provides some early efforts by considering complex tasks simultaneously to expose the shortcomings of existing vision methodologies, while encourages the study of perception and action in tandem. Research has advancement towards objectives over the ensuing years. Finally, the research progresses the visual perception current challenges or difficulties owing to improvements where a natural compliance has been used, outlines the projects for future growth patterns.

Olive Leaves Disease Detection and Classification Using Deep Learning

Sohail Akhtar, Muhammad Munwar Iqbal and Muhammad Altaf
University of Engineering and Technology Taxila Pakistan
sohail.akhtar@students.uettaxila.edu.pk, munwar.iq@uettaxila.edu.pk,
i.m.muhammad41@gmail.com

Olive trees, well-known for their importance in global agriculture, supply vital nutrition to millions of people globally. They grow well in Mediterranean areas, however, but still, there are several kinds of challenges, such as olive peacock spot and aculeus olearius disease. The efficient detection and classification of these diseases have implications for the sustainability of olive production. This study utilizes advanced deep-learning methodology to facilitate the detection of these diseases. The dataset consists of three distinct categories, namely healthy leaves, leaves harmed by aculeus olearius, and leaves affected by olive peacock spot we used in our study. Our proposed model Inceptionv3, achieves an outstanding accuracy rate of 90%, indicating the significant potential of modern deep learning techniques in transforming the identification of agricultural diseases. The timely identification of such diseases has paramount significance in protecting the quality of crops and the dietary requirements of olives. This study signifies important advancement in the application of technology for effective disease diagnosis, thereby helping the sustainability of olive farming and, subsequently, global agricultural vitality.

Emotion predictions through EEG using spectrogram

Umar Sultan[1], Shahbaz Hassan[2] and Musharraf Ahmed[1]
[1]Riphah International University Islamabad, Pakistan
[2]FAST-National University of Computer and Emerging Sciences,
Islamabad, Pakistan
umarsultan.k94@gmail.com, shahbaz.hassan@isb.nu.edu.pk,
musharraf.ahmed@riphah.edu.pk

This research investigates methods for classifying emotions within the context of human-computer integration, with a specific focus on the utilization of Electroencephalogram (EEG) signals as a superior approach

compared to facial expressions and speech recognition, primarily due to their potential to enhance ecological validity. Utilizing EEG signals for emotion recognition provides a non-intrusive, portable, and cost-effective alternative to techniques like functional magnetic resonance imaging (fMRI). The study's primary objective is to classify nine distinct emotions found in the DEAP Dataset: Happy, Relaxed, Pleased, Neutral, Calm, Excited, Miserable, Distressed, and Depressed. The transformation of EEG data into visual representations is accomplished through an encoding methodology called Spectrogram. Subsequently, the study delves into the examination of the utilization of Convolutional Neural Networks (CNN) in tandem with Support Vector Machines (SVM) for the classification of emotions. This classification process is conducted on the visual representations that are generated from the previously transformed EEG data. The experimental outcomes reveal that the spectrogram image encoding method performed significantly well when compared with handcrafted features and a higher number of distinct emotions, achieving a rate of 73.01% when applied with CNN.

Mind Care Solution through Human Facial Expression

Ali Asghar[1], Muhammad Awais[1], Syed Hassan Raza Naqvi[1], Muhammad Umar Mehboob[1], Reqad Ali[1] and Jawaid Iqbal[2]

[1] Capital University of Science and Technology Islamabad, Pakistan.

[2] Riphah International University Islamabad, Pakistan.

Using proposed system psychologists can use technology to make decisions which can provide ease for both patients and psychologists. Psychologists can check the progress of patients by analyzing emotions reports of patient over time. Using historical data and emotion detection technology psychologists can make more accurate decisions. Using proposed system patient and psychologists don't have to go to anywhere they only need a device and internet. Based on the characteristics of patient emotion psychologist only need report generated by system and prescribe medicine in emergency situation. Proposed system improves consultancy method by using machine learning emotion detection algorithm. Proposed system detects facial emotion of patient by using CNN with HAAR cascade classifier. We use FER 2013 dataset to train our

model. We use VGG 19 architecture to train our model for optimization function to enhance the accuracy of model. We use RELU. We use DJANGO framework for integration with frontend. Result of our mo del on dataset 82.3% after find tuning the accuracy goes to 82.3% to 92%. We use recall and F1 method to check the performance of model. We trained model on the testing dataset which have gray scale images and 48*48pixel images to achieve his performance. To achieve our accuracy goal, we split dataset into trainee validation and testing dataset. We use CNN and achieve 93% accuracy in our system which help patient to get feedback only selected question and psychologist. Patient select psychologist to answer questions of psychologist system stores emotions of patient against every question to generate emotion report. Psychologist can analyze emotion report to provide better prescription to patient.

Hybrid Crow Search and RBFNN: A Novel Approach to Medical Data Classification

Maria Ali, Faisal Khan, Muhammad Nouman Atta, Abdullah Khan and Asfandyar Khan

Institute of Computer Science and Information Technology,

The University of Agriculture Peshawar, Pakistan

The Radial Basis Function Neural Network (RBFNN) is a commonly utilized artificial neural network for various classification tasks, but it has some limitations, such as issues with network latency and local minima. To address these challenges, researchers have explored different algorithms to improve learning performance and mitigate local minima problems. This study presents a new approach that combines the Crow Search Algorithm (CSA) with RBFNN to enhance the learning process and overcome the local minima issue associated with RBFNN. The study assesses the performance of this new model by comparing it to state-of-the-art models like Flower-pollination-RBNN (FP-NN,), Artificial Neural Network (ANN), and the traditional RBFNN. To evaluate the effectiveness of the proposed model, the study uses specific datasets, including the Breast Cancer and Thyroid Disease datasets from the UCI Machine Repository. The simulation results demonstrate that the proposed model outperforms the other models in terms of accuracy, with lower MSE and

MAE values. Specifically, for the Breast Cancer dataset, the proposed model achieves an accuracy of 99.9693%, MSE of 0.000307024, and MAE of 0.00789449. Similarly, for the Thyroid Disease dataset, the proposed model achieves an accuracy of 99.9535%, with MSE of 0.000464932 and MAE of 0.0057098. In summary, this analysis highlights the improved accuracy and effectiveness of the proposed model when compared to traditional approaches.

Enhancing Face Mask Detection in Public Places with Improved Yolov4 Model for Covid-19 Transmission Reduction

Muhammad Ayaz, Adnan Hameed, Said Khalid Shah and
Sadiq Nawaz Khan
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
ayazkhanttt@gmail.com, adnanjani0335@gmail.com,
skhalids2000@yahoo.com, sadiqnawaz97@gmail.com

Computer vision, a pivotal research area of the last decade, focuses on automating systems through image and video frame analysis. Post-COVID-19, leveraging computer vision for face mask detection has gained prominence. Face masks, endorsed by global health authorities, are vital for preventing virus transmission, necessitating automated systems for enforcement in public spaces. Despite existing AI solutions, their effectiveness diminishes in crowded or distant scenarios. Our proposed system adopts a Convolutional Neural Network (CNN)-based model, YOLOv4, finely tuned to identify mask non-compliance in adherence to COVID-19 SOPs. Notably, our dataset includes Muslim women with half and full-face veils, treated as adhering to face mask guidelines. Modifications to YOLOv4 cater to our unique problem, using a custom dataset with crowded images and pre-processing to enhance generalization. Testing on unseen images yielded a remarkable 97% detection accuracy, showcasing the model's efficacy in diverse, real-world scenarios. This research contributes to advancing computer vision applications, particularly in enforcing COVID-19 safety measures in public spaces.

Comparative Analysis of Motor Imagery Classification of EEG Data using Transfer Learning

Muhammad Talha Jahangir, Ali Hassan and Afaq Ahmad Khan
NUST College of EME, Rawalpindi Pakistan
mtjahangir17@ce.ceme.edu.pk, alihassan@ceme.nust.edu.pk,
aakhan.ce20ceme@student.nust.edu.pk

Motor Imagery (MI) images collected via Electroencephalography (EEG) are the most practical basis for constructing Brain Computer Interface (BCI). MI-based BCI provide a high level of flexibility, allowing people with mechanical limitations to interact with the systems through a variety of MI exercises. To increase the classification efficiency of MI signals utilized in BCI, several solutions have been proposed. There is still a vacuum for improvement in terms of performance by employing various strategies involving Transfer Learning (TL) techniques. In this paper, focus has been kept on deploying TL models without the use of complex statistical functions to calculate features of EEG signals. The signal processing technique named Short-Term Fourier Transform (STFT) was used to construct images from EEG signals and the final classification was carried out utilizing the InceptionV3, VGG16, and ResNet50 TL models. The methodology showcased in this paper indicates that the InceptionV3 Transfer Learning model outperforms the VGG16, ResNet50 model, Logistic Regression, k-nearest neighbours (KNN), Support Vector Machines (SVM), and Random Forest classifiers in terms of accuracy.

Importance of Assembly Language in Cyber Security and Reverse Engineering

Muhammad Talha Attari [1], Muhammad Ahmad Nawaz[2], Mubariz Rehman[2]
[1]Department of Cyber Security, Air University Islamabad Pakistan
[2]Faculty of Computing, Riphah International University,
Islamabad, Pakistan
muhammad1233talha@gmail.com, ahmad.nawaz@riphah.edu.pk,
mubariz.rehman@riphah.edu.pk

Unlike skill sets such as Network Security which are more commonly available, knowledge of Assembly Language is relatively rare.

Consequently, when a company requires someone with this skill set, the principles of supply and demand dictate that the scarcity of such individuals increases the value of the skill. Another reason for the significance of Assembly Language is its indispensable role in Reverse Engineering. Whether analyzing malicious software as a malware analyst or benign software as a vulnerability hunter, understanding Assembly Language is crucial. Regardless of the specific case, knowing Assembly Language is necessary to effectively reverse engineer software and identify vulnerabilities. However, it's important to note that discovering vulnerabilities and exploiting them require distinct skill sets. Moreover, if the objective is to secure a system, knowledge of assembly language is essential for delving deep into the system's core and comprehending its inner workings, enabling the development of effective security measures. So, the objective of this paper is to first understanding the assembly language, how the assembly language plays an important role in creating effective security measures.

Problems in Genomic Data Privacy in a Distribution Network

M. Ahmad Nawaz, Shahzad Ahmed Khan and Mubariz Rehman
Riphah International University Islamabad, Pakistan
ahmad.nawaz@riphah.edu.pk, shahzad.khan@riphah.edu.pk,
mubariz.rehman@riphah.edu.pk

In this article, we highlight the privacy concerns inherent in the publication of genomic data for clinical healthcare and research purposes. The growing integration of patient-specific genomic information has given rise to significant apprehensions regarding privacy due to which patient data is not commonly available. The research community has put forth various systems and privacy models (like Data Privacy preserving generative adversarial networks (DP-GAN)) with the intention of preserving individual privacy. These models aim to either eliminate or detect personally identifiable information or to implement specific data sharing modes that strike a balance between privacy and utility. Generative adversarial networks are mostly used for images to generate synthetic data. Within the scope of this article, we delve into different aspects of

genomic data, focusing on critical characteristics and attributes, such as Y-chromosomes, the uniqueness of genomic code, medical predictions derived from genomic test data, germline mutations, and the impact of de-identification on families. We also address the challenges and issues encountered in ensuring the security of genomic data when shared or published, particularly in the context of the aforementioned areas.

Analyzing Instant Messaging Applications for Digital Forensics and Criminal Investigations

Muhammad Ahmad Nawaz[1], Haider Sajjad[2], Yasir Hussain[2], Azhar Ghafoorr[2] and Hameed Ali[2]

[1]Faculty of Computing, Riphah International University, Islamabad, Pakistan

[2]Department of Computer Science, COMSATS University, Islamabad, Pakistan

ahmad.nawaz@ripah.edu.pk, haider.sajjad1888@gmail.com, yasirhussain.int@gmail.com, azharghafoor39@gmail.com, hameedaliikhan@gmail.com

Instant messaging (IM) applications have become ubiquitous in modern communication, with platforms such as WhatsApp, Messenger, Viber, Telegram, and WeChat boasting billions of users worldwide. While IM applications have enhanced user privacy and security through end-to-end (E2E) encryption, this feature has also raised concerns about its potential exploitation by malicious actors for criminal activities. Investigating criminal activities involving IM applications requires specialized skills in mobile forensic analysis. However, forensic investigators often face significant challenges due to the evolving nature of mobile technologies and the incompatibility of forensic tools with these platforms. This paper presents a comprehensive analysis of IM applications, highlighting their features, security mechanisms, and potential vulnerabilities. The analysis is organized in a tabular format to provide a valuable resource for forensic investigators. By providing a detailed breakdown of IM applications, their encryption protocols, and the

associated security implications, this paper aims to equip investigators with the knowledge necessary to address the complex landscape of digital evidence in the context of instant messaging. This research contributes to the field of mobile forensic investigations by providing a structured framework that can assist investigators in understanding and managing the digital evidence associated with IM applications. In an era where digital communication plays a pivotal role in both legitimate and criminal activities, this analysis serves as a valuable resource to enhance the capabilities of forensic investigators in tackling emerging challenges and ensuring justice in an increasingly digitized world.

Unveiling the Efficacy of AI-based Algorithms in Phishing Attack Detection

Tajamul Shahzad
Riphah International University Islamabad Pakistan
tajamul.shahzad@riphah.edu.pk

Phishing poses a significant challenge in an ever-evolving world. The increased usage of the Internet has resulted in the emergence of a different kind of theft referred to as cybercrime. The term cybercrime describes the act of invading privacy and illegitimately obtaining personal information through the use of digital platform. Primarily an approach named phishing is employed, which involves the use of spoof emails or bogus websites by the attackers to get the victim's personal information like their account credentials, debit or credit card's number, etc. To give the brief knowledge of phishing attacks and their types the objective of this work is to investigate various AI algorithms. Through a detail literature 14 AI algorithms which are repeatedly used for detection and these are Random Forests, Convolutional Neural Network, Naïve Bayes, K-Nearest Neighbours algorithm, Decision Trees, long short-term memory, Gated recurrent unit, Artificial Neural Network, AdaBoost, Logistic Regression, Gradient Boost, Multi-layer perceptron, Recurrent Neural Network, Extreme gradient boosting, and Support Vector Machine in order to detect phishing attacks. To verify the effectiveness of these algorithms an experiment is performed on two datasets. Among all the algorithms Convolutional Neural

Network, Multi-layer perceptron and AdaBoost achieved more than 90% accuracy, precision and sensitivity and it was showed through results that these algorithms are very efficient and can achieve high accuracy if used to the requirements of specific scenario with proper planning. Moreover, the paper shows how different AI techniques have been employed in multiple studies to detect and address phishing attacks. Also, this paper gives a complete list of current problems with phishing attacks and ideas for future studies in this area.

Ensemble Learning-Powered URL Phishing Detection: A Performance Driven Approach

Shougfta Mushtaq[1], Tabassum Javed[2] and Mazliham Mohd Su'ud[1]
[1]Faculty of Information Science & Technology,
Multimedia University, Malaysia
[2]Faculty of Computing, Riphah International University,
Islamabad Pakistan

With the rapid growth in the usage of the Internet, criminals have found new ways to engage in cyber-attacks. The most common and widespread attack is URL phishing. The proposed system focuses on improving phishing website detection using feature selection and ensemble learning. This model uses two datasets, DS-30 and DS50, each with 30 and 50 features. Ensemble learning using a voting classifier was then applied to train the model, achieving more accuracy. The integration of HEFS with the Random Forest Classifier achieved an accuracy of 94.6% with a significant reduction in the number of features used (20.8% of the original set). In the proposed model, ensemble learning is employed, resulting in accuracies of 96% and 98% for the DS-30 and DS-50 datasets, respectively. The ensemble model leverages a combination of classifiers to distinguish between phishing and legitimate websites.

Bridging the Gap: Enhancing Security Awareness, Management, and Employee Behaviors in InfoSec Policies and Standards

Hamza, Jawaid Iqbal and Salman Ali
Riphah International University, Islamabad, Pakistan
hamzaabdulmajeed@outlook.com

The volume of digital information is expanding, which makes it harder to secure data against security flaws. Information security management has become a major issue across industries as businesses become more conscious of the need to adopt strict rules and regulations to protect their priceless information assets. In particular, Information Security Policy Compliance (ISPC), management, awareness, and culture are the main topics of this study. Although the significance of security policy documents has been recognized, little information is available to help with compliance. This study aims to explore the factors that influence employees' transition from non-compliance to compliance with the Information Security Policy (ISP). Specifically, the focus is on understanding the role of Information Security Culture (ISC) in shaping employees' behavior toward ISP compliance. By examining the elements contributing to this shift, this research seeks to enhance our understanding of how ISC can effectively promote a security culture and encourage employees to adhere to the ISP guidelines. Within an organization, ISC contains common attitudes, behaviors, and beliefs about information security that influence how employees protect sensitive data. This study aims to clarify the complex link between these two notions by examining the effect of ISC on ISP compliance behavior. To establish a clear connection between ISC and ISP compliance behavior, this study makes use of a thorough framework. The results provide novel viewpoints and significant insights into how ISC growth within an organization can affect staff adherence to information security rules. By addressing existing knowledge gaps and limitations, this research contributes to information security policy compliance. Its primary objective is to assist organizations in developing effective strategies for promoting compliance and mitigating the risks associated with non-compliance. Ultimately, the research aims to foster an information security culture that enhances organizational data protection capabilities, particularly in the context of evolving security threats.

Classification of Malware Using Distributed Convolutional Neural Networks (DCNN)

Khawaja Daim Asif Ansari, Abid Ali and Muhammad Waseem Minhas
Department of Computer Science, Riphah International University, Islamabad, Pakistan

In the ever-evolving landscape of digital threats, the proliferation of malware poses a significant challenge, necessitating innovative solutions for detection and defense. This study introduces a pioneering approach to malware detection that combines the power of distributed computing, specifically Apache Spark and Hadoop, with cutting-edge Convolutional Neural Networks (CNNs). This union enables the efficient processing of vast datasets of malware samples and the extraction of intricate features critical for distinguishing benign from malicious software. Through rigorous evaluation on a dataset comprising over a million malware samples, this approach demonstrated exceptional detection accuracy, reaching an impressive 99%, all while maintaining computational efficiency. This research represents a significant step towards enhancing computer system security in the face of relentless digital threats, offering a beacon of hope in the battle against evolving forms of malware and fostering a safer and more secure digital realm for individuals, organizations, and society at large.

A Cutting-Edge Hybrid Approach for Precise COVID-19 Detection using Deep Learning

Muhammad Hamza[1], Safdar Abbas[1], Umar Hayat[2], Muhammad Hammad[1] and Addel Hashmi[1]
[1]National University of Sciences & Technology Islamabad Pakistan
[2]Bahria University Islamabad Pakistan

Early diagnosis of COVID-19 is essential for effective containment and treatment plans for decision-makers. The conventional approach to diagnosing this disease mostly depends on the expert interpretation of computer tomography (CT) or X-ray pictures (X-ray) by researchers. In this study, we employ images from the three

most common medical imaging modes—X-ray, ultrasound, and CT scan—to show how transfer learning from deep learning models may be used to conduct virus identification. On corona virus detection, this study employs and enhances four convolutional neural networks including DenseNet121, ResNet101V2, NASNetMobile and MobileNetV2. In this study, two main experiments were carried out. In the first experiment, a model was developed by combining imagery data to detect this virus. In the second experiment, separate models were trained, each considering a specific dataset, to identify the best-performing model. To compensate for the limited number of this virus images, data augmentation techniques were employed to artificially increase the number of available photos. The results indicate that the proposed models effectively accomplished the task of classifying COVID-19. The accuracy rates achieved by the combined model, utilizing DenseNet121, ResNet101V2, NASNetMobile, and MobileNetV2, were 88.21%, 93.02%, and 88.89% respectively. When using the combined imaging dataset, the CNN model employing ResNet101v2 exhibited superior accuracy compared to the NASNetMobile, DenseNet121 and MobileNetV2models.

Intelligent Algorithm for Automatic Runtime Selection of Scheduling Algorithm using Pattern Recognition Techniques

Salman Khan[1], Abrar Ahmad[2], Hasnat Raza[1] and Muhammad Mansoor Alam[1]

[1]Riphah International University, Islamabad, Pakistan

[2]NUST Islamabad, Pakistan

salmankhan446733@gmail.com, abrar.ahmad@ceme.nust.edu.pk, hasnatzaidi@gmail.com, m.mansoor@riphah.edu.pk

The central processing unit (CPU) stands as the paramount resource within a computer system, and its equitable allocation among various processes holds a pivotal role in determining system efficiency. CPU scheduling algorithms [1] are an integral component of the system, orchestrating the sequential execution of processes to ensure continuous CPU utilization. Historically, researchers have advocated for a priori selection of scheduling algorithms, primarily contingent upon the

characteristics of the operating system. In our innovative approach, we endeavor to introduce a runtime algorithm recommendation system. Embedding machine learning techniques, our proposed algorithm aims to dynamically recommend scheduling algorithms in response to the fluctuating burst and arrival times of processes residing in the ready queue. By doing so, we anticipate an enhancement in the adaptability and efficiency of CPU scheduling, catering to the evolving demands of modern computing environments.

Sine Cosine Algorithm for Enhancing Convergence Rates of Artificial Neural Network: A Comparative Study

Maria Ali, Fatima Pervez, Muhammad Nouman Atta, Abdullah Khan and Asfandyar Khan

Institute of Computer Science and Information Technology,

The University of Agriculture Peshawar, Pakistan

Artificial neural networks (ANNs) are widely adopted by researchers for classification tasks due to their simplicity and superior performance. This study offerings the ANN and it variant such as Elman Neural Network (NN) model to address its strengths, although it faces with issues like local minima and slow convergence. This study presents a comprehensive evaluation of four distinct algorithms for classification tasks, focusing on their performance on both training and testing datasets. The algorithms such as Sine Cosine Algorithm is integrated with Artificial Neural Networks (SCA_ANN), Back Propagation Neural Networks (SCA_BP), Elman Neural Networks (SCA_ElmanNN), and Elman Neural Networks (ElmanNN). The evaluation employs two key performance metrics: Accuracy (ACC) and Mean Squared Error (MSE). The training dataset, representing 70% of the data, is used for algorithm training, and the testing dataset, constituting the remaining 30%, assesses the algorithms' ability to generalize to new, unseen data. Results indicate that SCA_ElmanNN in both training and testing datasets, achieving high accuracy and minimal MSE, showcasing its proficiency in classification and prediction precision. SCA_BP and SCA_ANN also demonstrate robust

performance. Conversely, ElmanNN, while relatively accurate, exhibits a slightly higher MSE on the testing data, indicating some variability in its predictions. These findings offer valuable insights for researchers in selecting the most appropriate algorithm for specific classification tasks.

DNA MethPred: Identifying DNA Methylation Sites Using Position Specific One Hot Encoding Technique

Khalid Usman, Khairullah Khan and Wahab Khan
Institute of Computer Science & IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
khalidusman 90@yahoo.com

DNA methylation, a crucial biological process, modulates DNA activity without altering its sequence, playing a pivotal role in life development and growth, and exhibiting close association with various diseases. This process involves the addition of a methyl (CH3) group to the 5th carbon atom of the cytosine base, a nitrogen base in the DNA strand. Computational methods have been integral to researching DNA methylation, emphasizing the necessity to identify methylation sites in DNA sequences through computational approaches. Recent years have witnessed the establishment of computational techniques, notably machine learning approaches, to investigate DNA methylation sites. The incorporation of machines as predictors in bioinformatics has become indispensable, with computational approaches posing contemporary challenge in identifying DNA methylation sites. Past researchers dedicated significant efforts to this pursuit, applying diverse methods and feature extraction techniques, resulting in satisfactory outcomes in terms of accuracy, sensitivity, specificity, and Mathew's correlation coefficient. This research focuses on an advanced computational method capable of training machines to accurately identify methylation sites in DNA strands. Leveraging the Support Vector Machine (SVM) approach, a deep learning algorithm for supervised classification, we introduced a unique feature extraction method termed as position specific one hot encoding technique. Our machine learning approach surpasses the previous methods, particularly in accuracy and sensitivity, demonstrating its efficiency in the precise identification of DNA methylation sites.

Knowledge-based Word Tokenization System for Urdu

Asif Ullah Khan[1], Sadiq Nawaz Khan[1], Khairullah Khan[1], Wahab Khan[1,2] and Rafiul Haq[3]

[1]Institute of Computer Science and IT,

University of Science & Technology Bannu, Pakistan

[2]Department of Computer Science,

International Islamic University, Islamabad, Pakistan

[3]College of Intelligence and Computing, Tianjin University, Tianjin, China

sadiqnawaz97@gmail.com, khairust@gmail.com, wahabshri@gmail.com

Word tokenization, a foundational step in natural language processing (NLP), is critical for tasks like part-of-speech tagging, named entity recognition, and parsing, as well as various independent NLP applications. In our tech-driven era, the exponential growth of textual data on the World Wide Web demands sophisticated tools for effective processing. Urdu, spoken widely across the globe, is experiencing a surge in speakers, emphasizing the urgent need for advanced Urdu Language Processing (ULP) systems. However, Urdu, labeled as a low-resource language, presents unique challenges due to its distinct writing style, the absence of capitalization features, and the prevalence of compound words. This study introduces a novel knowledge-based word tokenization system tailored for Urdu. Central to this system is a maximum matching model with forward and reverse variants, setting it apart from conventional approaches. The novelty of our system lies in its holistic approach, integrating knowledge-based techniques, dual-variant maximum matching, and heightened adaptability to low-resource language challenges compared to traditional machine learning (ML) approaches. Significantly, our system eliminates the need for a features file and pre-labelled datasets, streamlining the tokenization process. To evaluate the proposed model's efficacy, a comprehensive analysis was conducted on a dataset comprising 100 sentences with 5,000 Urdu words, yielding an impressive accuracy of 97%. This research makes a substantial contribution to Urdu language processing, providing an innovative solution to the complexities posed by the unique linguistic attributes of Urdu tokenization.

Security and Privacy Challenges of Big Data, Solutions and Recommendations

Azhar Ghafoor [1], Mubariz Rehman[2], Muhammad Islamam[2], Tabassum Javed[2] and Muhammad Ahmad Nawaz[2]
[1]COMSATS University Islamabad, Pakistan
[2]Faculty of Computing, Riphah International University, Islamabad, Pakistan
azharghafoor39@gmail.com, mubariz.rehman@riphah.edu.pk, m.islam@riphah.edu.pk, tabassum.javed@riphah.edu.pk, ahmad.nawaz@riphah.edu.pk

The amount of data has grown a lot because of things like the fast growth and expansion of communication networks, smart applications, and the use of the Internet. This huge volume of data is referred to as “big data,” and it has begun to gain significance as organizations use it to obtain insights, modify their marketing strategies, and boost their revenue. Even though big data brings huge opportunities for many sectors and decision-makers, it also poses a significant risk for many people. This risk is a result of the fact that analytic tools consist of collecting, organizing, and quickly assessing different data obtained from all potential and accessible sources. As behavioral data is combined and analyzed, individuals become more vulnerable to exposures of this nature. We covered large data security and privacy issues in this study. We also presented a detailed discussion on the challenges faced by BD and then provided a list of suitable solutions to them.

Empirical Investigation of Security Awareness and Training for Distributed Team to Safe from Cyber Attacks

Jamshaid Ahmad and Abdul Wahid Khan
Institute of Computer Science & IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
jamshiddwr@gmail.com, wahidkn@gmail.com

Strong cyber security measures are more important than ever as firms increasingly rely on remote teams to carry out their operations. This study

discusses how crucial it is to establish thorough security awareness and training programs that are specifically designed for distributed teams. It underscores the need for preventative actions to defend remote work environments while highlighting the changing nature of cyber threats. Organizations that prioritize security education may equip their distributed workforce with the information and abilities necessary to recognize, stop, and effectively respond to assaults. In order to enable vendor organizations in understanding the value of security awareness and training to protect against cyber-attacks, we have intended to employ a systematic literature study to identify a number of success factors and its practices.

From Signatures to AI: A Comprehensive Study of DDoS Detection Strategies in IoT & SDN

Shehroze Ahmed Khan, Syed Ihtesham Hussain and Jawaid Iqbal
Riphah International University Islamabad Pakistan

In the ever-evolving landscape of the Internet of Things and software-defined networks, the rapid growth of interconnected devices has set unprecedented ease and efficiency. However, this evolution also paved the pathway for the ominous cyber-attack: Distributed Denial of Service. DDoS attack by making the system unavailable for legitimate users threatens the data integrity, confidentiality, and availability in IoT and Software Define Network (SDN) infrastructure. This paper delves into the critical issue of DDoS attacks within the IoT and SDN environment, offering a comprehensive exploration of detection mechanisms and categorizing them into traditional approaches (signature-based) and anomaly-based approaches (ML, DL & Statistical). The core contribution is, that this paper, based on the literature review not only highlights the strengths & constraints of both signature-based and anomaly based approaches but also compares the ML and DL detection approaches against the DDoS. Signature based methods are effective in identifying known attack patterns while AI approaches show superiority in detecting the unseen threat. However, the efficiency of ML and DL approaches is highly dependent on the quality of training data and model robustness.

Comprehensive Review of CAN Bus Security: Vulnerabilities, Cryptographic and IDS Approaches, and Countermeasures

Omer Fayyaz Khan, Muhammad Mubashir and Dr. Jawaid Iqbal
Riphah International University, Islamabad, Pakistan
omer.fayyaz@gmail.com

Vehicle connectivity environments and advancements in vehicular technologies offer users both functional convenience and safety features, including remote diagnosis and assistance. To enable these capabilities, modern vehicles utilize various automotive serial protocols such as FlexRay, Local Interconnect Network (LIN), and the popular Controller Area Network (CAN). The CAN bus serves as a key protocol for in-vehicle networks (IVNs), facilitating the exchange of vehicle parameters among Electronic Control Units (ECUs). Despite its merits, the CAN bus has been found to have internal and external vulnerabilities. While numerous countermeasures are currently in place, the continuous advancements in vehicular interfaces have introduced new attack vectors, necessitating the development of additional safeguards. Existing research has primarily focused on CAN attacks initiated through direct interfaces, telematics and infotainment systems, and sensors. In this study, we aim to present an adversarial model for the CAN bus while also evaluating cryptographic and Intrusion Detection System (IDS) approaches considering real-time constraints and other relevant variables. Furthermore, we will classify available countermeasures into relevant categories and discuss their effectiveness. By conducting a comprehensive analysis of published works, our goal is to provide a comprehensive overview of CANrelated studies. This includes exploring potential mitigation techniques and identifying new research opportunities for IVNs. The synthesis of this information will offer valuable insights into the current state of CAN security, the challenges it faces, and the directions for future exploration. In summary, our study aims to address the vulnerabilities of the CAN bus, considering both existing and emerging attack vectors. By examining cryptographic and IDS approaches, we will assess their viability in real-time scenarios. Additionally, we will categorize and discuss the effectiveness of available countermeasures. Through this analysis, we strive to provide a holistic understanding of CAN-related research, paving the way for prospective mitigation techniques and identifying new horizons for IVNs.

Secure Room-Sharing Decentralized App Development on Ethereum Block Chain Using Smart Contracts

Hasnain Raza[1], Reqad Ali[2], Jawaid Iqbal[3] and Muhammad Awais[2]
[1]Institute of Management and Science Peshawar Pakistan
[2] Capital University of Science and Technology Islamabad Pakistan
[3]Riphah International University Islamabad Pakistan

This research aims to examine the impact of Block chain technology in the sharing economy. In recent years, Block chain has revolutionized various businesses, prompting academics to investigate the technology and integrate it to provide improved services. The sharing economy, which enables people to share their assets with others who need them, has seen significant growth in recent years, with companies such as Airbnb, Zostel, Hostel world, Careem, Uber, and Ola being examples of this growth. However, the majority of sharing economy transactions take place on a centralized infrastructure with a third party, which is vulnerable to dangers such as hacking and data misuse, and it comes at a higher cost and requires more effort to maintain. A decentralized approach, such as the peer-to-peer and smart contract approach used in the accommodation sharing process, can counter these drawbacks. The research will construct a model of the proposed architecture as a DApp in Ethereum and propose a safe and secure accommodation using a block chain-based accommodation-sharing system architecture. The goal of this research is to provide an understanding of the Block chain revolutio n and its applications in daily life.

Energy Efficient Protocol for Wireless Body Area Sensor Networks

Abdul Hamid and Muhammad Javed
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan

In this research, we present an innovative routing protocol designed for Wireless Body Area Sensor Networks (WBASNs), focusing on reliability, energy efficiency, and high data throughput. Our approach employs a multi-hop network topology to minimize energy usage and extend the

network's operational lifespan. To determine the optimal parent node or forwarder, we introduce a novel cost function. This cost function selects a parent node based on two key criteria: high residual energy and minimal distance to the sink. The residual energy aspect ensures an equitable distribution of energy consumption among sensor nodes, while the distance parameter enhances the likelihood of successful packet delivery to the sink. Our simulation results demonstrate that our protocol significantly enhances the network's stability period, thereby prolonging the operational lifespan of individual nodes. These extended stability periods lead to improved packet delivery to the sinks, a crucial factor in the context of continuous patient monitoring.

The Fourth Industrial Revolution: A Global Revolution on Recent Advances in Science, Technology, and Society

Prof. Dr. Md Shohel Sayeed
Multimedia University Malaysia

The major technological advancements of the Fourth Industrial Revolution, or Industry 4.0, are revolutionizing industrial production. The First Industrial Revolution was based on mechanization and steam engines; the second on the use of electricity energy and mass production; and the third on electronics and information technologies, resulting in a high level of automation in manufacturing. Industry 4.0 takes automation of manufacturing processes to a higher level with smart autonomous systems capable of self-cognition, self-optimization, and self-customization.

Industry 4.0 includes concepts, tools and applications that complement a smart embedded system of machines able to communicate with each other and people and perform autonomous tasks in industrial production processes. The main tools include cyber-physical systems (CPSs), the Internet of Things (IoT), big data and cloud computing, autonomous robots, simulation and visualization models, and additive manufacturing. Automation and robotics are perceived as key components – the arms and legs – of Industry 4.0; cameras and other sensors are perceived as the senses; data and connectivity are compared to the nervous system; and artificial intelligence (AI) is the brain. AI enhances industrial processes by

enabling the synergetic collaboration between humans and robots in smart factories for mass customization.

It is the goal of 4th Industrial Revolution to create a human-centric society in which both economic development and the resolution of societal challenges are achieved, and people can enjoy a high quality of life that is fully active and comfortable. It is a society that will attend in detail to the various needs of people, regardless of region, age, sex, language, etc. by providing necessary items and services. The key to its realization is the fusion of cyber space and the real world (physical space) to generate quality data, and from there create new values and solutions to resolve challenges. Hence, the main objective of the 4th Industrial Revolution is to realize a society where people enjoy life to the fullest.

LoRA Technology: A Review

Muhammad Ayoub Kamal[1,2], Aznida Abu Bakar Sajak[1], Laiq Muhammad Khan[3] and Mazliham Mohd Su'ud[4]

[1]Malaysian Institute of Information Technology ,
Universiti Kuala Lumpur, Kuala Lumpur, Malaysia

[2]DHA Suffa University, Karachi, Pakistan

[3]Institute of Business and Management, Karachi, Pakistan

[4]Persiaran Multimedia, Multimedia University, Malaysia

The IoT is a rapidly industry that uses communication technologies to transform items into every time connected smart devices. This makes it easier to develop smart techniques for inspection and improvement, and also a host of other new applications in a variety of fields. The most extensively LongRange Communications (LRC) is a widely used technique for allowing LPWANs on unlicensed frequencies (LoRa). It offers wide range for low-power gadgets even after its moderate Data Rates, allowing it a suitable connectivity solution for several IoT scenarios. This study compares and analyses various LPWAN technologies such as Sigfox, LoRA, LTE-M and NB-IoT. In respect of cost, data rate, equipment lifespan, and system throughput, the result indicates that LoRa outperforms other technologies. NB-IoT technology, on the other hand, improves in quality of service and latency. The study also focuses on the performance of LoRa

networks in different scenarios, with respect to range, energy, scalability and also assess the performance of indoor and outdoor model with respect to assessment metrics. In addition, we provide a comprehensive introduction of LoRa technology by examining its key characteristics, potential, and unresolved concerns.

A New Hybrid Strategy to Facilitate Patients by Measuring Vital Health Signs Utilizing IoT

Burhan Ullah[1], Aurangzeb Khan[1], Muhammad Fahad[2], Muhammad Sadiq[1] and Rafi Ullah[1]

[1]Institute of Computer Science and IT,

University of Science & Technology Bannu, Khyber PK, Pakistan

[2]School of Electrical and Information Engineering,

Tianjin University, Tianjin, China

This work introduces a novel approach to monitor patients' health signs at home, healthcare centers, or during travel. The proposed wheelchair design involves medical care features and semi-autonomous steering using Robotics, Bio-Mechanics, and Bio-Electronics along with Wheelchair supportive strategy. The Vital health sign of the Patient can be easily measured by installing biomedical equipment onto the wheelchair. All these techniques which are going to be installed in the technologically based wheelchair are also aimed to be put into a patient bed in hospital as well as at home and facilitate Quadriplegic, Paraplegic, Cardiovascular, cognitive, psychiatric, paralysis and chronic patients Here, this suggested power wheelchair system is an Arduino based design of joystick controlled having other technologies like GSM and GPS. The concerned doctor and the patient's family members would be signalized through an alert message as soon as such readings occur that exceed the optimal limit. The disabled person is navigated technologically on occasional bases as alerts are transmitted. When embedded with such items, a patient occupying the wheelchair and all such other kind of patients are promised to be released from the ambits of cabins. We are trying to bring maximum efficiency and make things less costly by adapting the modern information technology according to the needs of medical healthcare unit.

Quality Requirement challenges in software development for quantum computing

Sana Latif and Abdul Wahid Khan
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
sanalatifustb@gmail.com, wahidkn@gmail.com

The issues of meeting quality requirements in software development must be examined more closely in light of quantum computing, a fast developing technology that has the potential to disrupt numerous sectors. The complexity that software engineers must overcome in order to develop dependable and effective quantum software systems is examined in this study. The basic contrasts between the classical and quantum computing paradigms present new problems, first and foremost. We have planned to conduct systematic literature review for the identification of challenges faced by vendor organization in quality software development using Quantum computing. There are various challenges like algorithm, hardware limitation etc. but the detail challenges will be identified in this study. The challenges may be quantum scalability, quantum hardware reliability, quantum software development and quantum software verification etc. All the other challenges will be identified through proper way in future. This research study will encourage the vendor organization to know in advance about all the challenges for quality software development in quantum computing. The identified challenges will be validated through empirical study and will try to know about new challenges from the industry expert.

A Model for Deciding Adoption of DevOps Approach in Global Software Development from vendors' perspective

Saad Ullah Khan and Abdul Wahid Khan
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
saadkhankhel@gmail.com, wahidkn@ustb.edu.pk

DevOps (Development and IT Operations teams) is a contemporary approach within the field of software engineering for software

development process that has gained significant interest in recent times. This is primarily due to its numerous advantages, such as bridging the gap between development and operations teams, swiftly identifying and rectifying failures, and expediting the development and deployment of new updates. DevOps plays a pivotal role in the development process and addresses the evolving needs of the future. Nevertheless, the adoption of DevOps for global software development by vendor organizations is a complex decision due to its various characteristics. In this study, we aim to create a model that can aid vendor organizations in the process of selecting and deciding to embrace DevOps for their global software development practices.

Empirical investigation of quantum computing for integration with existing software architecture process

Fahad Rehman and Abdul Wahid Khan
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
engr.fahad97@gmail.com, wahidkn@ustb.edu.pk

Quantum computing is an emerging technology that can solve problems more quickly than classical computers. Over the past few years, Quantum computing has given a new vision to software engineering. The hopes for quantum computing have gotten better with time, due to the industries' growing interest in quantum computing. Like other fields of study, quantum computing also faces major challenges. This proposal aims to identify the critical challenges faced by vendor organizations in quantum computing integration with existing software architecture. Systematic literature review (SLR) technique will be used to identify these challenges of software integration with quantum computing architecture. An empirical investigation will be conducted for the validation of the SLR findings and will try to find some new challenges from industry experts if any.

Empirical investigation of challenges of Data privacy and security in Quantum computing in software development

Muhammad Jawad and Abdul Wahid Khan
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
ghumzadawar@gmail.com, wahidkn@gmail.com

Software development is one of many areas that quantum computing, which offers a significant advance in computational capacity, is expected to transform. With regard to data security and privacy, this disruptive technology, however, also presents new difficulties. This study explores the important issues of data protection when integrating quantum computing into software development, showing both possibilities and difficulties. We have planned to use systematic literature review and empirical methods for the identification and validation of the identified challenges and their practices. The ultimate goal of this study is to develop a model that will support vendor organization in secure software development for quantum computing.

Model for Distance learning System due to the Digital Transformation in Covid-19.

Lahba and Abdul Wahid khan
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan

In response to the outbreak of corona virus (COVID-19) pandemic the two major influence sectors are education and Business,107 countries had implemented national school closure in March 2020. It left a billion students out of schools and it bring the loose of 0.6 years of schooling adjusted for quality. Where it lefts huge loss on the other side it left positive effects also which prominently due to the digital transformation practices in post COVID-19 world. This paper presents the positive effect of COVID-19 on global society due to digital transformation in education scenarios. The education positive factors like, Distance Learning Tools (DLT) which are Software, Online platforms and Apps etc Distance

Learning Strategies (DLS) which are online class time limits, students and teachers feedback for interactive environment, shares material before online class, training of students and institution staff for digital technology and guideline to the parents about online class environment for their children at home etc. These all tools and online class strategies are must be recommended by HEC for online classes of higher education. The success factors DLTs and DLSs are basically fined for developing the "Distance Learning Model". This proposed Model will mitigate the loss of education in pandemic like tough conditions specifically as well as can be adopt in normal situation also. Research methodology is SLR Approach which fallow with its all phases and for analysis SPSS tool is used and different conclusion are drawn about the search success factors, Techniques will be using here are Fuzzy AHP for DMSS (Decision Making Support system).

A Bilingual Immersive Environment for Kids Learning

Tufail Ahmad, Arifa bibi, Umar Farooq and Ihsan Rabbi
Institute of Computer Science & IT,
University of Science & Technology Bannu, Khyber PK, Pakistan.
tufailjan762@gmail.com, khaniarifa792@gmail.com,
umar214@gmail.com, ihsanrabbi@gmail.com

Virtual worlds, alternatively called Metaverses, provide an improved learning experience as they not only increase user participation, reduce technological distraction and overcome the boredom of humans in repetitive tasks but also cope with the issues caused by content duplication and strict rules followed by game environments. They offer cooperative, coherent, consistent and social places. Client viewer software is used for user immersion in these environments.

This work presents a simple bi-lingual environment developed for kids' learning using the OpenSimulator framework. The content is made interactive and dynamic using the Linden Scripting Language. FireStorm viewer was used for the development of in-world content and interaction of users with the content and other users. This work used Blender, Adobe Photoshop and Illustrator for developing images of different objects and adding their related dynamics before integrating them within the

OpenSimulator. It developed some very basic activities for learning about colours, famous National personalities of Pakistan, Urdu alphabets, geometrical shapes and fruits. Bots were used to populate the content for making it more appealing. The system provides an arbitrary number of tries to perform each activity in English and Urdu, and guides kids through a real time positive feedback towards an improved learning.

The developed environment could be used for comparing learning outcomes with traditional methods. It could incorporate more activities and lessons. 3D working models of the alphabets, fruits and vegetables, and customized avatars capable of interacting with kids would offer more positive impact on learning. It could include more languages in future.

Impact of Online Learning on Students Self Concept Motivation at University Level in Khyber Pakhtunkhwa

Irfan Ullah Khan[1] and Muhammad Bilal Qureshi[2]
[1]Department of Education & Research,
University of Lakki Marwat, Khyber PK, Pakistan
[2]Department of Computer Science & IT,
University of Lakki Marwat, Khyber PK, Pakistan
irfan@ulm.edu.pk, mbilal@ulm.edu.pk

Online learning plays vital role in this present digital era. That is why the present study was conducted in order to highlight the role of online eLearning in student's self-concept motivation. The present study was conducted to investigate the impact of Online learning on university level students' self-concept motivation in southern districts of Khyber Pakhtunkhwa. Main purpose of the study was to explore the impact of Online learning on students' self concept motivation at university level in southern districts of Khyber Pakhtunkhwa. The researcher collected data from four hundred (400) students of BS Level both urban and rural at at university level in public sector universities and self-developed questionnaire was used for measuring the parents' level of education and the students' self-concept. Similarly, the collected data were analyzed through SPSS version 20. Regression and β (coefficient of impact) were used as statistical techniques. Finally, the results of this study clearly

revealed that online E. Learning opportunities plays vital role in students' self-concept motivation at university level and the study clearly highlighted that at this stage the students are mature enough to use various online learning sources which motivate them to learn more and more and improve their knowledge.

The Impact of Educational Leadership on Entrepreneurship Development and Economic Growth in Southern Districts in KP: A Multifaceted Analysis

Wresham Gul and Parveen Ishaq
Institute of Education and Research,
University of Peshawar, Khyber PK, Pakistan
wreshamgul007@gmail.com, drparveen@uop.edu.pk

The relationship between educational leadership, entrepreneurship development, and economic growth in the Southern Districts of Khyber Pakhtunkhwa, Pakistan, is examined in depth throughout this paper. The research aims to clarify how these activities contribute to the progress of the region's economy by examining the role of educational leaders in encouraging an entrepreneurial mentality and skill set among the local populace. The study uses a combination of quantitative and qualitative approaches to investigate the intricate interactions between these factors, illuminating the crucial role of educational leadership as a driver of sustainable entrepreneurship and economic growth in this particular setting. The findings have consequences for regional educational institutions and politicians as well as for a larger understanding of how education, entrepreneurship, and economic growth in emerging economies.

Prediction of Student's Academic Performance through Data Mining Approach

Muhammad Mubashar Hussain, Muhammad Waqas Aziz, Shahzad Akbar, Syed Ale Hassan and Farwa Urooj

Department of Computing, Riphah International University, Faisalabad Campus, Pakistan

mh081993gmail.com, bismillahwaqas@gmail.com, shahzadakbarbzu@gmail.com, alehassan1000@gmail.com, farwaurooj144@gmail.com

The universities and institutes produce a large amount of student data that can be used in a disciplinary way and useful information can be extracted by using an automated approach. Educational Data Mining (EDM) is an emerging discipline used in the educational environment to deal with big student data and extracts useful information. The data mining of students' data can help the At-risk students as well as the stakeholders by the early warning. This study aims to predict the performance of the students based on student-related data to increase the overall performance. In existing studies, insufficient attributes and complexity of network model is a problem. The students' previous records and grades need to be analyzed. In this approach, Levenberg Marquardt Algorithm (MLA) deep learning algorithm is used. The data consists of the class test, attendance, assignment and midterm. The neural network model consists of four input variables, three hidden and one output layer. The performance of the deep neural network is evaluated by accuracy, precision, recall and F1 score. The proposed model gained higher accuracy of 88.6% than existing studies. The study successfully predicts the student final grades using current academic record. This research will be beneficial to the students, educators, and educational authorities as a whole.

Case Study Protocol for Software Outsourcing Quality Requirement Change Management Model

Jamshed Ahmad and Abdul Wahid Khan
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
Jam_kust@yahoo.com, wahidkn@uom.edu.pk

Software quality requirement evaluation is the procedure to study any software quality requirement in reliable software development perspective, where it can improve the output of an organization. It provides a road map for qualitative research in requirement change, consistent software improvement, planning design and model driven engineering. We have developed a model called software outsourcing quality evaluation management model (SOQEMM) from vendors' perspective. We have identified various factors having positive as well as negative impact on software quality evaluation management. Systematic literature review (SLR) has been used for the identification of critical success factors (CSFs), critical barriers (CBs) and significant practices of software quality evaluation. A questionnaire survey has been performed for the verification of findings of SLR. The aim of this paper is to develop a protocol for the evaluation of SOQEMM with the help of case studies. We used four case studies for the evaluation of SOQEMM. We have taken help from a case study as it reveals real-world information. Participants who took part in the case studies all agreed that SOQEMM is clear and can easily be used. Participants showed their interest in using the model for providing solutions to the problems of the quality requirement changes in the OSDO environment. The SOQEMM has the power of showing the change in the required position of an organization working in the OSDO paradigm. Participants gave a common suggestion that there should be supported automated tools helping practitioners for the evaluation of an organizational requirement change. Based on the suggestion by participants, some changes were made and discussed in the paper.

Software Development Readiness Model for Quantum Computing in Health Care Organization

Faheem Ahmed and Abdul Wahid Khan
Institute of Computer Science & IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
Faheem.cse2013@gmail.com, wahidkn@gamil.com

This study proposes a software development readiness model for quantum computing (SDRMQC) that is specifically designed for the benefits and difficulties that come with quantum computing. Software designers must adjust as quantum technologies progress in order to take advantage of the potential advantages. The study presents a thorough readiness model that accounts for the complexity of quantum algorithms, the shifting landscape of quantum hardware, and the necessary skill sets. It also emphasizes the importance of validating and verifying quantum software. This model offers a methodical way to evaluate and improve software development teams' quantum computing preparedness, enabling a more seamless entry into this revolutionary period of computing. We have planned to extract success factors, challenges and their practices through systematic literature review (SLR) that will support in designing of software development model for quantum computing. The identified SLR findings will be validated through questionnaire survey in software industry. The ultimate goal of this study is to develop SDRMQC to assist the vendor organization to gauge their status of software development for quantum computing.

Exploring Factors for a Framework Deciding Adoption of DevOps in Global Software Development from vendors' perspective: A Protocol for a Systematic Literature Review

Saad Ullah Khan and Abdul Wahid Khan
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan
saadkhankhel@gmail.com, wahidkn@ustb.edu.pk

This study focuses on the lack of DevOps practices in global software development and highlights the benefits of DevOps which offers

automation, improved collaboration between development and operations teams, cost-effective development, error reduction, enhanced product quality, quicker failure detection, and faster modification deployment. Global software development has become increasingly prevalent in the modern software industry due to its potential for cost savings, access to diverse talent pools, and the ability to cater to a broader market. To effectively manage and streamline the complexities like socio-cultural, geographical, and temporal differences of global software development, organizations are turning to DevOps practices. Existing frameworks, in this aspect, have limitations in providing comprehensive insights into DevOps practices in the GSD context. To bridge this research gap, the study uses a systematic literature review (SLR) to find key success factors and their associated practices to make a framework for vendor organization to consider it when selecting and adopting DevOps as their methodology for global software development initiatives.

Team Interaction in Agile Development: A Comparative Analysis

Muhammad Fahad[1], Hira Beenish[1] and Muhammad Shahzad[2]
[1] College of Computing and Information Sciences,
Karachi Institute of Economics and Technology, Karachi, Pakistan
[2]Computer Science department, Bahria University, Karachi, Pakistan
mfahad@kiet.edu.pk, hira@kiet.edu.pk,
muhammadshahzad.bukc@bahria.edu.pk

Modern and creative software industry is now witnessing the popular and quick software development methodology ‘Agile’. Over the last decade, teams in agile have proven themselves as the core point of difference in comparison with traditional development methods. Agile teams are usually self-organized, cross-functional and adoptive that enables the project to carry out uniformly and in an effective manner. Though agile methodology offers potential challenges for development teams and their interaction, still we believe that agile teams can create a huge difference in a development of quality product with in a required amount of time.

The aim of this paper is to formatting guidelines for self-managing teams in the context of several parameters like Monitoring, Frequency, Structure, Directed, Size, Communication, Location, Nature and Focus. These parameters are compared and analyzed. Study identifies how these factors behave differently in XP, Lean, FDD (Featured Driven Development), Crystal, Adaptive, SCRUM and DSDM. This paper is helpful for academia to identify the current trend and short comes related to team interaction and formation. This paper would also guide the researcher to adopt the best strategy to make team interaction more agile in the different situation.

A Comprehensive Analysis of Realistic Environment for Cloud and Mobile Cloud Computing

Muhammad Asim Shahid[1,2] and M.S. Mazliham[3]
[1] Universiti Kuala Lumpur, Malaysia
[2] Institute of Business Management, Karachi, Pakistan
[3] Multimedia University, Malaysia

Cloud computing provides fast and on-demand access to nearly limitless resources. The combination of cloud computing and mobile devices has led to the development of mobile cloud computing technology. Mobile cloud computing enables mobile devices to connect to cloud services. In this context, it is necessary to compare cloud and mobile cloud computing and explain the fundamental architectures of various mobile cloud computing applications. Researchers in this field may need to conduct field investigations as cloud computing continues to spread throughout society. However, setting up and carrying out these tests in actual cloud environments can be expensive. Therefore, modeling and simulation techniques are good options for simulating cloud computing infrastructure. Several simulation tools have been designed specifically for cloud computing. In this article, we discuss the most powerful simulation techniques in this research area, namely, CloudSim, CloudSim Plus, CloudAnalyst, iFogSim, and CloudReports. In this research, the comparison of cloud simulators shows which cloud simulator efficiently creates data centers, and virtual computers that may be set suitably, a cloud simulator facilitates the modeling of different types of cloud

applications and makes analysis easier. Numerous cloud simulators have been created to date and are being actively utilized for cloud research.

Revisiting Security and Privacy in Modern Cloud Computing

Muhammad Ahmad Nawaz[1], Haider Sajjad[2], Yasir Hussain[2] and Hameed Ali[2]
[1]Faculty of Computing, Riphah International University, Islamabad, Pakistan
[2]Department of Computer Science, COMSATS University, Islamabad, Pakistan
ahmad.nawaz@ripah.edu.pk, haider.sajjad1888@gmail.com, yasirhussain.int@gmail.com, hameedaliikhan@gmail.com,

Cloud computing stands as a promising technological advancement, characterized by its pervasive features such as online storage, high scalability, and seamless accessibility. This innovation has become increasingly attractive to organizations, as it facilitates significant reductions in capital costs and workforce requirements, thereby driving businesses towards cloud-based operations. While cloud computing offers immense benefits, it is not without its drawbacks. The expanding adoption of cloud services has brought about security and privacy concerns, encompassing issues such as data privacy, authenticity, integrity, and non-repudiation. Although extensive research has been conducted in this domain, there is still a notable gap in comprehensive exploration, particularly considering the constraints posed by the Internet of Things (IoT) in conjunction with cloud computing. This paper addresses this gap by providing an in-depth analysis of cloud computing within the context of IoT, focusing on key parameters such as integrity, privacy, security, nonrepudiation, portability, and computation. The findings presented herein aim to serve as a valuable resource for future research endeavors in the realm of cloud computing enabled IoT, facilitating a deeper understanding of the interrelationship between cloud computing, IoT, security, and privacy.

Comparative Analysis of Traffic Density Estimation Techniques in Intelligent Transportation System

Hira Beenish[1], Tariq Javid[2], Muhammad Fahad[1], Saima Sultana[3] and Sadia Nazim[4]

[1]College of Computing and Information Sciences,
Karachi Institute of Economics and Technology, Karachi, Pakistan

[2]Department of Biomedical Engineering, Hamdard University,
Karachi, Pakistan

[3] Department of Computer Science, SZABIST University,
Gharo campus Karachi, Pakistan

[4] Department of Computer Science, Bahria University Karachi, Pakistan

Congestion on urban roadways is a rapidly increasing issue requiring the attention of transportation authority's worldwide. It has been decided that solutions to this problem will pursue mostly to ensure shorter and often timely travel times, as well as reduce pollution and wasted fuel consumption. Traffic density estimation (TDE) is an effective derived parameter for analyzing the dynamic situation of traffic congestion. In this paper a typical case study is presented as a scalable system design for selected techniques that are implemented in traffic density estimations. The objective of this study is to estimate traffic density using various methodologies involving the vehicle counting to provide estimates. The comparison results of TDE techniques shows the Convolutional neural network (CNN) algorithm from the YOLO framework provides the optimum efficiency for vehicle recognition and counting, reflecting the effectiveness of all approaches to enhance the traffic efficiency of the case study design. The techniques for estimating traffic density are also investigated in the perspective of intelligent transp ortation system with sustainability aspects. This article's objective is to improve and analysis the progress concerns for estimating the traffic density. The comparison analysis results show significance in accessing the possible applications of selected TDE techniques for predicting the future progression of action. From experimental results, for comparison analysis CNN algorithm (based on the YOLO framework) method was found more suitable in detecting and classifying vehicles in a dynamic traffic scene with moving vehicles. For detecting vehicles, the Haarcascade method seemed to be the least accurate. Future research will concentrate on a thorough analysis of each

feature's impact on traffic density via optimizing the parameters and identifying a better approach to collecting data.

Traffic rules Violation Detection in Smart Cities using Internet of Things: A Systematic Literature Review Protocol

Asad Hussain, Ihsan Rabbi and Umar Farooq
Institute of Computer Science and IT,
University of Science & Technology Bannu, Khyber PK, Pakistan

Intelligent Transportation System is an integral part of the concept of smart cities, which is becoming a reality in many countries with the help of Internet of Things (IoT). Reducing traffic violations plays a crucial role in the successful implementation of these systems. The concept of Internet of Vehicles (IoV) is an extension of IoT infrastructure, which is developed for this specific reason. However, there are many challenges towards its successful implementation and, therefore, there is need to explore the current implementations and determine their challenges. Systematic Literature Review (SLR) is an organized method to investigate such challenges.

This paper focuses on determining various traffic rules violations and investigating the limitations of current solutions found in the literature. Towards this, it developed a comprehensive SLR protocol incorporating all the generic and specific terminologies of traffic violations in the literature. It adopted well defined criteria for the inclusion and exclusion of literature. The proposed protocol was used to explore relevant literature from four well known databases.

The initial search resulted in a total of 6449 articles, which were reduced to 51 for analysis purposes when this work applied the inclusion, exclusion and quality assessment criteria on them. This work reported eight different violations including over-speeding and lane changes among the most frequent ones. It reported current solutions to these violations and detailed their associated challenges.