SECOND INTERNATIONAL CONFERENCE ON ENGINEERING & COMPUTING TECHNOLOGIES – ICECT 2022

BOOK OF ABSTRACTS

23 November, 2022

FACULTY OF ENGINEERING & COMPUTER SCIENCES
NATIONAL UNIVERSITY OF MODERN LANGUAGES – NUML
ISLAMABAD, PAKISTAN.

Contents

About

1.1 National University of Modern Languages – NUML

The National Institute of Modern Languages (NIML) obtained charter in year 2000 and started its functioning as an university since then. National University of Modern Languages (NUML) has contributed in the dissemination of knowledge in various disciplines and produced eminent professionals not only in the area of languages but also in various contemporary fields. Over the years, NUML has branched out into numerous disciplines like Engineering, Computer Sciences, Management Sciences, Arts & Humanities and Social Sciences. Having qualified and competent faculty, NUML continues to grow from strength to strength.

1.2 Faculty of Engineering & Computer Sciences – FE&CS

Faculty of Engineering Computer Sciences is one of the vibrant faculties of NUML. It consists of Computer Sciences, Electrical Engineering, Software Engineering and Mathematics departments. FE&CS enjoys a good and well established repute in the market and has produced successful professionals and eminent scientists and researchers in the field of Computer Sciences and Engineering.

1.3 International Conference on Engineering & Computing Technologies – ICECT-2022

Acquaintance with technology makes us confident in meeting and dealing with the challenges of the modern world. ICT provides a bridge to cope with such challenges. International Conference on Engineering & Computing Technologies (ICECT) provides a platform where novel and innovative ideas related to Information and Communication Technologies are presented, discussed and exchanged between scientists and researchers. The conference is annually organized by the FE&CS – NUML, with a principal aim to focus on modern trends pertaining to computer sciences, engineering, and related disciplines.

1.4 Aims & Objectives of ICECT-2022

The aim of the conference is to provide a platform to researchers and practitioners from academia as well as industry to meet and share their research ideas, experience and knowledge. The conference is annually organized with the principal aim to focus on modern trends pertaining to Computer Sciences, Engineering, and other related areas.

1.5 Patron-in-Chief

Maj Gen Muhammad Jaffar HI(M) (Retd)
Rector, National University of Modern Languages, Islamabad, Pakistan

1.6 Chairs & Co-Chairs

1.6.1 Steering Committee Chair

Dr. Basit Shahzad
Dean, Faculty of Engineering & Computer Science
National University of Modern Languages, Islamabad, Pakistan

1.6.2 Conference Chair

Dr. Sajjad Haider
Head, Department of Computer Science
National University of Modern Languages, Islamabad, Pakistan

1.6.3 Conference Co-Chairs

Dr. Muzafar Khan
Head, Department of Software Engineering
National University of Modern Languages, Islamabad, Pakistan

Dr. Sheraz Alam
Head, Department of Electrical Engineering
National University of Modern Languages, Islamabad, Pakistan

Dr. Sadia Riaz
Head, Department of Mathematics
National University of Modern Languages, Islamabad, Pakistan

1.7 Committees

1.7.1 Planning & Coordination Committee

Dr. Sajjad Haider, Computer Science **(Head)**
Dr. Sheraz Alam Khan, Electrical Engineering
Dr. Muzafar Khan, Software Engineering
Dr. Sadia Riaz, Mathematics
Dr. Naila Rafique, Mathematics
Dr. Moyeezullah Ghori, Computer Science
Dr. Sajid Saleem, Electrical Engineering
Dr. Farhan Sohail, Electrical Engineering
Dr. Raheel Zafar, Software Engineering
Mr. Raja Shamayel, Computer Science
Mr. Farhad M. Riaz, Computer Science **(Conference Secretary)**

1.7.2 Technical Committee

Dr. Sajid Saleem, Electrical Engineering **(Head)**
Dr. Attaullah, Computer Science
Dr. Moeenuddin Tariq, Computer Science
Dr. Touseef Javed, Computer Science
Dr. Hina Ashraf, Computer Science
Dr. Qurattul Ain, Computer Science
Dr. Fazli Subhan, Computer Science
Dr. Farhan Sohail, Electrical Engineering
Dr. Rizwan Amirzada, Electrical Engineering
Dr. Raheel Zafar, Software Engineering
Dr. Javvad-UR-Rehman Khan, Electrical Engineering
Dr. Javeria Kanwal, Software Engineering
Dr. Sumaira Nazir, Software Engineering
Dr. Nargis Fatima, Software Engineering
Dr. Anum Naseem, Mathematics
Dr. Awais Ahmed, Mathematics
Dr. Muhammad Usman, Mathematics
Mr. Bilal Shahnawaz, Software Engineering

1.7.3 Administration & Management Committee

Mr. Zafarullah, Computer Science **(Head)**
Mr. Muneeb Abbasi, Computer Science
Mr. Asim Rehan, Computer Science
Mr. Ehsanul Haq, Computer Science
Mr. Mohibullah, Computer Science
Mr. Ali Saeed, Computer Science
Mr. Hasnain Abbas, Software Engineering
Mr. Zohaib Ahmed, Software Engineering
Mr. Zainul Abideen, Computer Science
Ms. Zainab Yousaf, Computer Science
Ms. Zainab Malik, Computer Science
NCSS Team Members, Computer Science

1.7.4 Marketing & Sponsorship Committee

Dr. Hina Ashraf, Computer Science **(Head)**
Dr. Fazli Subhan, Computer Science
Dr. Touseef Javed, Computer Science
Ms. Sadia Ashraf, Computer Science **(Web Development)**
Ms. Anab Batool, Computer Science
Ms. Iqra Chaudhry, Computer Science
Ms. Bushra Khan, Software Engineering
Mr. Awais Gondal, Software Engineering
Mr. M. Umer Haroon, Software Engineering
Mr. Shahid Khan, Mathematics

1.7.5 Finance Committee

Dr. Moeenuddin Tariq, Computer Science **(Head)**
Ms. Shumaila Qayyum, Computer Science
Ms. Sabina Irum, Computer Science
Mr. Mohsin Abbas, Software Engineering

Paper Abstracts

2.1 An integrated dielectric resonator and pyramidal horn-based antenna with large frequency ratio for wireless access points

Awab Muhammad[1], Muhammad Umar Khan[1], and Mohammad S. Sharawi[2]

[1]*School of Electrical Engineering and Computer Science, National University of Sciences and Technology, Islamabad, Pakistan.*
[2]*Poly-Grames Research Center, Electrical Engineering Department, Polytechnique Montreal, Montreal, QC H3C 3A7, Canada.*
umar.khan@seecs.edu.pk, mohammad.sharawi@polymtl.ca

Abstract—In this paper, an integrated antenna solution is presented for wireless access points that are simultaneously operating in the 2.45 GHz and 60 GHz bands. The complete antenna system consists of two cylindrical Dielectric Resonator Antennas (cDRAs), between which a metallic block is placed. The metallic block acts as a PEC wall between the two cDRAs, and is responsible for the 2×2 MIMO operation of cDRAs for the WiFi (2.4–2.495 GHz) band. Furthermore, the metallic block also houses a waveguide-fed pyramidal horn antenna at 60 GHz to cover the complete WiGig (57–64 GHz) band.

2.2 Neuro-adaptive mechanism based sliding mode control design for a quadcopter uav

Faiz Alam, Jiao Lianmeng and Alam Nasir

School of Automation, Northwestern Polytechnical University, Xi'an, China.
{faizkhattak91, alamktk95}@gmail.com, jiaolianmeng@nwpu.edu.cn

Abstract—This paper presents an accommodating tool for the uncertainties being found in the parameters of a quadcopter UAV during its flight mission by proposing an optimized multi-layer perceptron neural network (OMLPNN) incorporated with a sliding mode control (SMC). The proposed OMLPNN makes the SMC robust and adaptive to different parametric uncertainties by introducing a novel weight modification law comprising a sliding mode theory. The proposed scheme is proved to be

stable by the Lyapunov stability theory. Through simulation results, the performance of the proposed mechanism has been validated.

2.3 Comparison of different control techniques for a class of 3-dof unmanned underwater vehicle

Muhammad Mudassir, Azib Gulzar, Umair Kamal and Hasnain Aslam

Department of Electronics and Power Engineering, PN Engineering College, National University of Sciences and Technology, Karachi, Pakistan.
mudassir.jawaid7@gmail.com, azib_4@hotmail.com, umair_kamal9917@yahoo.com, hasnain@pnec.nust.edu.pk

Abstract—At present, Unmanned Underwater Vehicles (UUV) are a topic of interest for marine researchers. Researchers around the globe such as Thor I Fossen and Khac doc. contributes a lot to develop an appropriate control technique for marine vehicles. We are contributing our little effort to examine the control prospect of UUV. This paper consists of four stages at first, kinematics and dynamics modelling of UUV is proposed. Modelling of the system is based on 6 degrees of freedom (DOF), as we are interested in depth control only. Secondly, we convert the 6-DOF system to 3-DOF (depth control configuration). Our system then linearized for further control techniques. In the third stage, we are applying the given control techniques namely; Proportional Integral Derivative Controller (PID), Pole Placement Controller, Linear Quadratic Regulator Controller (LQR), Sliding Mode Controller (SMC) and Modified Sliding Mode Control for stabilizing UUV system at the desired depth. SMC and MSMC are also implemented in presence of external disturbances. Furthermore, at the last stage, we will evaluate the results of applied controllers and examine the best stabilizing controller. The efficacy of the proposed control techniques is implemented using numerical simulations.

2.4 Fraud detection of credit card using supervised machine learning

Ammarah Urooj Aftab[1], Iqra Shahzad[2], Maira Anwar[1] and Amna Sajid[2]

[1]*Millitary College of Signals, National University of Sciences and Technology, Rawalpindi, Pakistan.*
[2]*Faculty of Engineering and Computer Science, National University of Modern Languages, Islamabad, Pakistan.*
{ammarah.arooj96, mairaanwar148}@gmail.com, {iqra.shahzad, amna.sajid}@numl.edu.pk

Abstract—Credit card fraud is an unauthorized activity used to get a person's confidential information to get something illegally. There are advanced technologies that can bypass security hence frauds became extremely difficult to identify. Therefore, many algorithms and analysis technologies are used to identify and act against fraud. The main aim of this study was to identify the best suitable supervised machine learning algorithm by implementing Logistic Regression, Random Forest, Support Vector Machine, and Decision Trees. As the dataset was highly imbalanced, SMOTE (Synthetic Minority Oversampling Technique) technique was used for oversampling of data. The performance of the trained models was evaluated using several evaluation metrics including confusion matrix, accuracy, precision, recall, f1-score, MCC (Matthews Correlation Coefficient), and AUC (Area Under the Curve) as well.

2.5 An IoT and machine learning based neonatal sleep stage classification

Awais Abbas[1], Hafiz Sheraz Sheikh[2], Haris Ahmad[3] and Saadullah Farooq Abbasi[4]

[1]*Department of Electrical Engineering, National University of Technology, Islamabad, Pakistan.*
[2]*Department of Electrical Engineering, Air University, Islamabad, Pakistan.*
[3]*Junior executive Engineer, Explosive Ordinance Disposal, NRTC, Haripur, Pakistan.*
[4]*Department of Biomedical Engineering Riphah International University, Islamabad, Pakistan.*
Saadullahfarooq93@gmail.com

Abstract—Sleep, in neonates, is used to access the quality of brain and physical development. It is an important hallmark to access the deficiencies in the development of brain. Typically, neonatal sleep has been divided into three stages: active sleep (AS), quiet sleep (QS) and intermediate sleep (IS). Traditionally, neurologists are hired to classify neonatal and adult sleep. Polysomnography (PSG) is considered as a gold standard to classify sleep. However, PSG consumes tons of time and money. To address this issue, over the past two decades, researchers proposed multiple algorithms for automatic sleep stage classification. These algorithms work achieved outstanding results for some cases i.e. quiet sleep detection still, lacks in many aspects. One major drawback of the existing research is the amalgamation of awake and active sleep into low voltage irregular (LVI) state. This amalgamation corrupts 40% of the overall EEG signal. For this reason, we proposed an algorithm for neonatal sleep-wake classification using machine learning. The proposed research is divided into three steps. Firstly, EEG signal was pre-processed using finite impulse response filter to remove the noise and artifacts. Clean EEG signal is then divided into 4560 30-sec segments. Then, twenty prominent EEG features were extracted from time, frequency and spatial domain. After feature extraction, support vector machine was used for sleep stage classification. The propounded study outperformed all

the existing algorithms for sleep-wake classification with a mean accuracy of 83.7%. Four-fold cross validation was used to validate the overall dataset. Multiple other performance metrices i.e. sensitivity, specificity, Kappa were calculated to prove the efficacy of the proposed study. Statistical results show that the proposed study can be used as a real-time neonatal sleep and Awake classification algorithms, as this did not use prior post-processing technique.

2.6 Artificial intelligence based smart surveillance drone for real time detection of social distancing and face mask

Qundeel Baber and Muntazir Hussain

Department of Electrical and Computer Engineering, Air University, Islamabad, Pakistan.
qundeelbaber@gmail.com, muntazir_hussain14@yahoo.com

Abstract—The sudden outcast of the COVID-19 pandemic has influenced a great number of individuals around the globe. This infection primarily spreads through beads that rise out of an individual contaminated with COVID and represents a danger to other people. Perhaps the most ideal approaches to remain protected from getting contaminated is wearing a face mask in open domains and taking care to maintain a safe social distance as demonstrated by the World Health Organization (WHO). In this paper, we have proposed an artificial intelligence (AI) based drone system that utilizes TensorFlow and OpenCV to identify face mask on individuals and monitors social distance. By object detection techniques the distance is detected between the pair of persons. If the individuals are not at a threshold distance then the red box will indicates the violation. The drone is also able to generate alert alarms, notify alerts to the control room, make announcement in crowds for the adherence of standard operating procedures, store and transmit data to the authorities. The model works aerially through a drone. Hence, it decreases the interaction by providing aerial remote surveillance.

2.7 Software requirements prioritization techniques : a systematic literature review

Ali Raza[1], Sumaira Nazir[1], and Nargis Fatima[1], and Tahir Ali[2]

[1]*Depatment of Software Engineering, National University of Modern Languages, Islamabad, Pakistan.*
[2]*Depatment of Electronics, Quaid I Azam University, Islamabad, Pakistan.*

ali.raza4873@gmail.com

Abstract—Requirements Prioritization is a requirement engineering activity that determines the ranking of requirements concerning the implementation of software systems. Numerous requirements ranking techniques are introduced by the researchers and are available in the literature, however the software requirement engineers are facing the challenge regarding the selection of prioritization techniques to deliver quality software. The literature lacks the organization of prioritization techniques and major part of the requirement change management and their prioritization according to the change management rules. To address the challenge and reduce the gap this research aims to organize the existing requirement prioritization techniques concerning three perspectives, such as the prioritization techniques already used in the projects, the economic concerns regarding the use of existing prioritization techniques, and the advantages and downsides of each requirement prioritization technique. The research methodology incorporated for this study is a Systematic Literature Review (SLR). As a result of this research work, 33 prioritization techniques are evaluated. The conducted research study will be beneficial for the software requirements engineer to select the appropriate technique according to their context and for the researchers to propose strategies to address the downsides of the identified techniques.

2.8 Guided image filter inspired improved single image dehazing method

Muhammad Shan Saleem, Gulistan Raja and Junaid Mir

Electronics Engineering Department, University of Engineering and Technology, Taxila, Pakistan. shansaleem15@gmail.com

Abstract—With the recent proliferation of industries, traffic and wildfires, the haze is becoming a common atmospheric phenomenon which has a critical impact on the computer-vision based acquisition systems. To address the image degradation due to the hazy weather, we propose an improved physical model based single image dehazing method. The proposed dehazing process includes the calculation of the atmospheric light value, estimation of the transmission map and finally, the restoration of scene radiance from the hazed image. The main contribution of this work is to combine the recent advances in the atmospheric light value calculation techniques with the utilization of refined guided filter by employing a colour image as guidance for the estimation of an optimized transmission map. The detailed qualitative and quantitative analysis of our proposed method with current state-of-the-art techniques, reveal that dehazed images generated from our algorithm are of

improved visual quality with sufficient image details.

2.9 Agile retrospective practices in Pakistani software industry: a case study

Ali Raza, Jaweria Kanwal, Maryam Imtiaz Malik and Fatima Gillani

Department of Software Engineering, National University of Modern Languages, Islamabad, Pakistan. ali.raza4873@gmail.com

Abstract—In every industry manual working process is ending and moving to the software technology. Rapid change in the technology software development organization need to update and improve their development process. In software programming techniques agile practices focus on the client comfort and responsive to change. Retrospective practices are important activities for process improvement in Agile software development as they increase the collaboration between the team members. With the help of these retrospective practices, challenges and problem in the development process are identified and suitable solutions are provided. Team velocity are managed according to the progress of the previous sprint. Retrospective practices are initially difficult for new team and take about 3-5 meeting to make mindset on the retrospective meeting. In this research a case study is conducted to analyze whether retrospective practices are followed by the Pakistani software industry. Our analysis shows that retrospective practices are followed by the Pakistani software industry for process improvement but they have both positive and negative impact on the software quality and improvement of the team. In Pakistani industry, various retrospective practices are followed according to software quality requirements but mostly teams are satisfied by the practices followed in their teams.

2.10 Forecasting color trends in textile fashion industry by using machine learning model

Mehwish Jabeen[1], Mudassar Ahmed[1], Isma Hamid[1] and Qamar Nawaz[2]

[1] *1National Textile University Faisalabad, Pakistan.*
[2] *University of Agriculture, Faisalabad, Pakistan.*
{mehwishjabeen2016, mudassar.utm}@gmail.com, ismahamid@ntu.edu.pk, qamar@uaf.edu.pk

Abstract—Fashion trend is the most important factor in the textile industry because it is directly affected by the sale. It is important to find out what customer wants in the future. Adaptation of trend by the customers is determine the popularity of trend in

textile industry. The practice of predicting fashion trend colors allows us to determine what consumers will want in the future. The textile fashion sector is erratic, and fashion trends shift quite quickly. To improve sales, the latest fashion trends must be attentively monitored. One of the major driving force behind the textile fashion industry's growth is color forecasting. If a product does not match with consumer demand, it will go unsold and cause loss for the industry. How can the under or over stocking issue be resolved with the help of the textile manufacturing sector? In order to answer this question, we forecast color trend for textile industries. This research led to the development of a model for predicting color demand in the textile industry. We predict upcoming purchases using historical demand information for Alkaram Textile Mill. The K-means method is used to extract the dominant color in the dress and generate clusters on the basis of colors. Clustering on RGB images are based on Pixel's intensities. Thus, given picture of size MxN, get MxN pixels, each of which is made up of three different colors: Red, Green, and Blue. The study demonstrated the method which worked and forecast colors that can increase sales.

2.11 Motion separation using robust principal component analysis for video stabilization

Sehrish Qais Mirza and Hina Ashraf

Department of Computer Science, National University of Modern Languages, Islamabad, Pakistan. hina.ashraf@numl.edu.pk

Abstract—Most of the videos that have been recorded by the portable cameras having annoying shaky motion and jitter. These jitters and shaky motions need to be removed from successive frames to obtain stabilized video. Video stabilization is an important effective process in which a compensated video sequence is generated from input jittery video sequence, in this compensated video undesired shaky motions and jitters are removed. Because of unintentional shake of human hand, home videos usually suffer from unintentional motions. Objective of a video stabilization is to produce a new video seen with removed shaky motions and also separate the global and local motion in the videos. In this paper, a video stabilization technique is proposed which uses Robust Principal Component Analysis (RPCA). PSNR is used as the quality metric to compare the results of the proposed technique and the state-of-the-art technique. It was concluded that the proposed technique performs better than the other state-of-the-art techniques.

2.12 An experimental investigation to improve quality of communication using anoni application

Bilal Raza, Sumaira Nazir and Nargis Fatima

Department of Software Engineering, National University of Modern Languages, Islamabad, Pakistan.
bilalraza9266@gmail.com, {sunazir, nfatima}@numl.edu.pk

Abstract—Communication between teachers and students is directly related to the performance of the students. The students feel reluctant to communicate due to shyness, fear of peers, and teachers, as result it leads to poor communication among student and teacher communication. Numerous research work has been performed for the impact analysis of communication in an anonymous mode with the help of social media applications concerning participation of the students during class sessions. It is apparent through literature, that participation of students increases in an anonymous communication mode either face to face or in an online session. Quality of communication refers to the topic relevant to communication between student and teacher. Anonymous communication is useful to increase the students' participation, however, due to its anonymity component it leads to distraction during the class sessions. The objective of this research work is to improve the quality of anonymous communication and to discover the influence of anonymous communication on non-participating students. The research methodology employed for this study is the experiment with software engineering undergraduates. using ANONI application. This research study has introduced a method to improve communication quality. The method demonstrates constructive results as only 2 off-task activities were observed that is very less as compared to previous research findings.

2.13 Onyx - a novel voter's authentication and anonymity preserving protocol for i-voting: rebuilding trust in digital electoral - II

Khan Farhan Rafat

Department of Cyber Security Air University, Islamabad, Pakistan.
farhan.30.smc@gmail.com

Abstract—In the Hi-Tech world, authentication refers to the digital identity verification of some entity or process as the one being legitimate to access further the resource linked to it, aka authorization or the Need-o-Know principle. With this significance,

authentication is the first defense against system intrusion and data breaches. Various authentication technologies, such as facial recognition, biometric verification, and passwords, suit different security requirements. The COVID'19 pandemic of recent times has changed the trends of socializing, that is, from physical to online (virtual) presence. Likewise, remote or work-from-home culture has flourished and resulted in business gains with the least maintenance cost. However, the situation has its downsides, like risking users' privacy and businesses. The risk of compromising their anonymity and privacy along with data breaches by getting hacked has caused distrust in doing online business/activities. i-Voting is also not indifferent in that sense, where people fear compromising their anonymity by casting votes via digital electoral. In an attempt to rebuild trust in i-Voting, this research, as a test case, focuses on the security aspects of the authentication mechanisms used in the i-Voting System of Estonia and the structure of the Aadhaar Unique Identification number issued in India. It is to elucidate the limitations observed in the explicit purview of the reference to the term" strong authentication" defined by the European Central Bank. It is followed by suggesting the remedy of the limitations observed by adopting our proposed novel digital authentication mechanism, which ensures the anonymity of both the ballot and the voter and is a novel contribution to date.

2.14 Comparison between fitbit's charge hr and microlife wrist watch for healthcare

Hina Ali

Department of Computer Science, National University of Modern Languages, Hyderabad, Pakistan.
hinaabdullah04@gmail.com

Abstract—There are numerous smart wearable devices existing in the marketplace; these devices demonstrate exclusive features like health measurement, entertainment, exchange of data, storage, biofeedback indicating emotions etc. Wearable device models may rely on smart sensors, chips, storage media, short-range wireless devices such as Bluetooth or local Wi-Fi setups. Wearable devices are heavily being used in healthcare industry and several manufacturing corporations like Samsung, Apple, Fitbit, Microlife etc. are providing smart gadgets for calculating pulse rate as cardiovascular disease have the highest mortality in the world. In our research work we have performed comparative analysis between these two devices considering different scenarios to find appropriate device for healthcare. Testing strategy which is used in this research work is Blackbox testing. Testing method includes both hardware testing and software testing.

2.15 NLP based analysis of public perception regarding covid-19 vaccines

Neelofer Memon, Zafi Sherhan Syed and Komal Memon

Department of Telecommunication, Mehran University of Engineering and Technology, Jamshoro, Pakistan.
memon.neelo12@gmail.com, zafisherhan.shah@faculty.muet.edu.pk, komal.memon@admin.muet.edu.pk

Abstract—The Covid-19 pandemic affects millions of people throughout the world. Everyone's life gets disturbed because of this pandemic. As the Covid-19 vaccines are now freely available but people still get feared about it because of the rumors spread by social media. Despite recommendations from experts, people show conceptions and perceptions regarding vaccines on social media platforms. The main objective of this study is to introduce the methodology to analyze the views of the public regarding covid-19 vaccines using a publicly available worldwide Twitter dataset. In this study, we have used Natural Language Processing to analyze the sentiments. For sentiment analysis, we use Keras embeddings (deep Neural network) and Top2vec was used for topic modeling. This research will offer assistance to the government so that they can distinguish the major issues and provide preventive measures by taking the help of social media.

2.16 Sentiment analysis of #5g using machine learning algorithms

Mehak Faryal[1], Muhammad Farhan Khan[1,2], Saeid Rezaei[2], and Muhammad Sohail[3]

[1]*University of Engineering and Technology, Taxila, Pakistan.*
[2]*Confirm Centre for Smart Manufacturing, University College Cork, Cork, Ireland.*
[3]*Riphah Institute of Systems Engineering, Riphah International University, Islamabad, Pakistan.*
mkpheryal@gmail.com

Abstract—Nowadays, Twitter is an interesting platform for researchers to perform sentiment analysis and opinion mining of data as it holds a massive amount of text. Thousands of users seamlessly have expressed their opinions on trendy topics and have used hashtags extensively. This research analyzes and classifies the sentiments shared via Twitter posts about 5G having 5G and related hashtags. The aim is to analyze users perceptions related to the 5G, its mobility, reach and impact on health. The sentiments about 5G are classified into positive, negative, and neutral categories. The machine learning (ML) algorithms such as Support Vector Machine (SVM), Logistic

Regression (LR), Multinomial Naive Bayes (MNB) and random forest, are applied to classify emotions using different libraries such as Sci-kit, NLTK for sentiment analysis. Thus generating a classification model with improved performance evaluated using metrics like accuracy, recall and F1-score. An 83.09% accuracy is achieved by applying SVM on self extracted dataset named "5G Myths". By applying LR, MNB and random forest, an accuracy of 80%, 75% and 57% is achieved. The results show that it is possible to identify key factors and critical information that form public opinion about acceptance or rejection of 5G technology.

2.17 An ensemble method for detection and mitigation of DDoS attacks

Muhammad Zeeshan Arshad, Zafar Iqbal, Syed Haleemullah Shah and Abdul Rehman Javed

Department Of CyberSecurity, Air University, Islamabad, Pakistan.
{211824, 211848}@students.au.edu.pk, zafar.iqbal@mail.au.edu.pk, abdulrehman.cs@au.edu.pk

Abstract—Cloud computing is the modern concept of delivering various services over the Internet, such as web applications, databases, and programs running on different machines. With advancements in Cloud computing technologies, greater vulnerability to attack may result from the unavailability of services during data storage and transmission. Among the various types of attacks on Cloud environments, distributed denial-of-service (DDoS) is the most common attack. Various techniques have been proposed to detect and mitigate these attacks, but they lack performance. In this paper, we propose a method to detect DDoS attack in the early stages and mitigate it by considering top-layer advancement at the application layer and transmission control protocol (TCP) handshake mechanism. This research employs various ensemble-based machine learning techniques to evaluate the behaviour of incoming traffic as legitimate or malicious to respond to DDoS attacks at the application layer. Moreover, the double TCP connection concept is also employed to prevent DDoS. Experiments reveal that the stacked voting method achieves the best F-score of 0.99 for detecting DDOS attacks.

2.18 ISLAP - an improved succinct and lightweight authentication protocol for low-cost RFID system

Salman Khan, Zafar Iqbal, Muhammad Ayaz Khan and Burhan Sher

Department of Cyber Security, Air University, Islamabad, Pakistan.

{212020, 211840}@students.au.edu.pk, {zafar.Iqbal, ayaz.khan}@mail.au.edu.pk

Abstract—Radio Frequency Identification (RFID) system employs radio waves to transmit a unique pattern between a tag embedded in an RFID card and a reader to verify a user's identity and grant access. It is considered a preferred form of authentication because of its simplicity. Along with widespread deployment, the rapid growth of RFID also comes with a number of security concerns and risks. Therefore, a secure authentication mechanism is essential to overcome the security issues of RFID. Although researchers have developed various security mechanisms, among them, Succinct and Lightweight Authentication Protocol (SLAP) is a low-effort RFID architecture that can withstand security threats. Our research shows that previously presented methods are vulnerable to stolen authenticator attacks, the problem of impersonation attacks, and anonymity problems. This research presents an improved and efficient method for RFID systems based on lightweight authentication protocol called ISLAP. That address the security threats and attacks seen in previous approaches. The suggested protocol is tested and verified using a software tool called ProVerif, designed to perform reasoning about the security properties of a protocol. The proposed protocol appeared adequately safe, with optimal output compared to other solutions.

2.19 Sustainable development of vehicular fog computing using karlskrona manifesto

Waseem Abbas[1], Inam ul Haq[1], Temur Rashid[1], Ali Hassan[1] and Muhammad Usman[2]

[1]*College of Electrical and Mechanical Engineering, National University of Sciences and Technology, Islamabad, Pakistan.*
[2]*University of Aberdeen, United Kingdom.*
{wabbas.cse19ceme, iuhaq.cse19ceme, trashid.cse19ceme@ce.ceme.edu.pk}@ce.ceme.edu.pk, alihassan@ce.ceme.edu.pk, usmanyousafzai@gmail.com

Abstract—The emerging concept of smart cities, smart vehicles and smart traffic systems using Vehicular Fog Computing (VFC) technology is based on the concept of cloud and edge computing which assist in the automation and implementation of such smart concepts. But implementing and utilizing Vehicular Fog Computing (VFC) will need an excessive amount of power for the communication and decision-making system and will also lead to cause a huge amount of electromagnetic radiation. The sustainable and environment-friendly development and implementation of such systems and infrastructure is still a key challenge for the industry. This research article undergoes a thorough sustainability analysis of the proposed system using the Karlskrona manifesto, which helped us to identify the current and future viable

goals and aim of the system and their order of impact on the individuals. Society and economy. The development of The Sustainability and Analysis diagram (SusAD) explored the immediate, intermediate, and structural impact of technical, individual, social, environmental and economic dimensions of the system, this research article also proposes alternative ways to achieve sustainability and prevent the adverse effects of the system implementation.

2.20 Systematic literature review on methodologies for improving software quality in software development process

Inam-Ul-Haq[1]**, Waseem Abbas**[1]**, Mehran Shakoor**[2] **and Wasi Haider Butt**[1]

[1]*Department of Software Engineering, College of Electrical Mechanical Engineering, Rawalpindi, Pakistan.*
[2]*Abasyn University, Islamabad, Pakistan.*
{iuhaq.cse19ceme, wabbas.cse19ceme, wasi}@ce.ceme.edu.pk, mehranshakoor007@gmail.com

Abstract—For better repute in software monopoly, quality of product is one of the essential factors in any corporation. Quality of the product depends on the satisfaction of customer. Product quality is measured by customer satisfaction with that product. The goal of quality might be attained only over convenient fundamentals and policies. The enormous and developing nations are making improvements on every day for improving the quality of the products they manufactured to increase the satisfaction of their customers. Every corporation tries their best to design quality software that best suits to customer needs. For the purpose of better quality, some fundamentals and policies were made, however there might be distinct problems, there are several rationales for poor quality of product. We choose quantitative approach of research as methodology for our research. Basically, quantitative approach focuses on measuring and evaluating the data. This paper will address different issues that were corresponding to these rationales. Several techniques will also be explained, as well some alternative solutions are defined in this paper that will leads to good quality of any product or software. Furthermore, we conclude that systematic approach and incremental approach, these are good but the problem with these approaches is that requirements will be freeze. It will be complex and problematic to accommodate changes. In short, all techniques have their own impact on enhancement of software quality.

2.21 A markerless augmented reality-based framework for interior design with ARCore

Zubaira Naz[1], **Javeria Khan**[1] **and Muhammad Usman Ghani Khan**[2]

[1]*Al-khawarizmi Institute of Computer Science, University of Engineering and Technology Lahore, Pakistan.*
[2]*Department of Computer Science, University of Engineering and Technology Lahore, Pakistan. zubaira.naz@kics.edu.pk*

Abstract—The recent advancement in technology allows humans to interact with real and virtual objects. Augmented Reality (AR) is an immersive technology that integrates virtual objects into the real environment and provides interaction with them. AR superimposes the virtual content i.e., images, text, and 3D objects in the real environment and users can experience this content using AR-supported devices and AR glasses. In this paper, we proposed an AR-enabled framework for the interior design of the home. This developed framework includes the creation of a virtual catalog of different interior design products that consists of 3D models of products and their placement and visualization in the real environment. This system also provides Interaction with the 3D products in their real environment. The scanning of the real-time area and markless 3D product placement is carried out using an Android phone. The ARCore, AR Foundation, and Unity platforms were used for the realization of this system. By using this framework users can visualize the different interior designing 3D products i.e. furniture items, in their home before actually purchasing them.

2.22 Development of 8-channel board with EEG based sensors for brain to computer communication

Javeria Khan[1], **Zubaira Naz**[1] **and Usman Ghani Khan**[2]

[1]*Al- Khwarizmi Institute of Computer Science, University of Engineering and Technology Lahore, Pakistan.*
[2]*Department of Computer Science, University of Engineering and Technology Lahore, Pakistan. {javeria.khan, zubaira.naz}@kics.edu.pk, usman.ghani@uet.edu.pk*

Abstract—Electroencephalography (EEG) sensors measure an electrical signal related to various brain activities which can be used to control different brain-computer interface (BCI) applications. These sensors transmit EEG signals to a BCI circuit which measures the resolution of brain signals. While designing a BCI device, an EEG signal acquisition board along with the signal processing unit is required. The aim of this

research is to design a low-cost EEG board that can be used to control different BCI applications such as a wheelchair, prosthetic, or any other robotic device. The acquired EEG signal is first amplified using low noise Instrumentational Amplifier. After that, the amplified signal is filtered in order to remove significant noise signals. Finally, the filtered signals are sent to a microcontroller. The developed EEG board has the ability to capture 8 EEG channels at a sampling frequency of 250 Hz which transfers raw signal over a Bluetooth connection. Moreover, different assessment techniques were also assessed for the evaluation of the EEG board. With a 34db signal-to-noise ratio and 81.86% motor imagery signal classification results, the designed board is eligible for controlling various BCI devices using EEG signals.

2.23 I-Cursor system for handicapped people

Muhammad Barjabin, Abdul Rehman and Syeda Zainab Yousuf Zaidi

Department of Computer Science, National University of Modern Languages, Islamabad, Pakistan.
szyzaidi@numl.edu.pk

Abstract—Human computer interaction is one of the important aspect of technology, without a good user experience one cannot provide ease to the users. The key motive of the project is to enhance the Human computer interaction and to automate the system with main characteristic of detecting the user facial landmarks and to control the movement of cursor around the screen with the help of the user's facial movements. The existing system is mostly based on head gears and hardware controls, which makes the system more expensive and unreliable. Here the problem arises for individuals with severe physical disabilities such as amyotrophic lateral sclerosis or cerebral palsy, with listed disabilities the overall user experience and human computer interaction is a challenging task itself. This system will help specifically those people with disabilities listed and this system will allow those users to control the movement of the mouse cursor with the help of their facial movement, system will first detect the person's face using the laptop/computer's camera and by the movement of their face they will be able to control the movement of the cursor around the screen. The main aim is to make user experience so simple that disable persons can also use the system just like the normal users. This project works on real-time making sure each components works fine together is the key point. This project uses the algorithms of machine learning for the detection of the user's face these algorithms are the most growing and efficient framework of Artificial Intelligence in this era. This work uses python for the detection of the user's face, facial highlights, clicking, activation or deactivation and courser movement more accurately and effectively in the possible way.

2.24 Fault analysis and classification in the electrical power system using convolutional neural network

Hafsa Ahmad, Muhammad Yousif and Maliha Shah

Department of Electrical Engineering, U.S.-Pakistan Center for Advanced Studies in Energy, National University of Sciences and Technology, Islamabad, Pakistan.
hahmadeep19.ces@student.nust.edu.pk

Abstract—Fault identification is essential in improving the power quality of the power system. As the complexity of the power system is increasing persistently with the increase in distributed generation. Classification of faults is necessary for ensuring system security and reliability. Therefore, in this paper, an advanced Convolutional Neural Network (CNN) is used in the identification of symmetrical and unsymmetrical faults occurring in the power system. The IEEE-14 bus system is used as a case study. The efficacy of the system is monitored by creating contingency scenarios using MATLAB Simulink. The obtained results verified the performance of a CNN technique. It generates high accuracy with minimum training time and gives robust performance.

List of Reviewers

Afaque Manzoor	Institute of Business Administration, Sukkur
Ahmad Ali	National Engineering & Scientific Commission, Islamabad
Anum Naseem	National University of Modern Languages, Islamabad
Aqib Rehman	Foundation University, Islamabad
Arjum& Fatima	Quaid-i-Azam University, Islamabad
Asad Mahmood	University of Luxembourg, Luxembourg
Asia Anjum	National University of Modern Languages, Islamabad
Ata Ullah	National University of Modern Languages, Islamabad
Benish Sharfeen	National University of Modern Languages, Islamabad
Bilal Mehboob	Mohammad Ali Jinnah University, Karachi
Faiq Ahmad	National University of Modern Languages, Islamabad
Farhad Riaz	National University of Modern Languages, Islamabad
Farhan Sohail	National University of Modern Languages, Islamabad
Hafsa Dar	University of Gujrat, Gujrat
Hamza Zafar	Capital University of Science & Technology , Islamabad
Haris Yaqub	Institute of Applied Sciences & Technology, Haripur
Haseeb Hafeez	International Islamic University, Islamabad
Hina Ashraf	National University of Modern Languages, Islamabad
Huma Nadeem	National University of Modern Languages, Islamabad
Humaira Batool	National University of Modern Languages, Islamabad
Imran Ahsan	National University of Modern Languages, Islamabad
Iqra Shahzad	National University of Modern Languages, Islamabad
Iqra Suleman	College of Elect & Mech. Engineering, NUST, Rawalpindi
Jaweria Kanwal	National University of Modern Languages, Islamabad
Kamran Ullah	Pakistan Institute of Engineering & Applied Sciences, Islamabad
Khawaja Moyeez	National University of Modern Languages, Islamabad
Maryam Imtiaz	National University of Modern Languages, Islamabad
Mehdi Hassan	Air University, Islamabad

Mubashar Sarfraz	National University of Modern Languages, Islamabad
Mudassar Adeel	National University of Sciences & Technology, Islamabad
M. Waqar	National University of Modern Languages, Islamabad
Naeem Iqbal	Universiti Teknologi, Malaysia
Nargis Fatima	National University of Modern Languages, Islamabad
Quaratulain	National University of Modern Languages, Islamabad
Rabia Fazal Dad	National University of Modern Languages, Islamabad
Raja Shamayel	National University of Modern Languages, Islamabad
Sabina Irum	National University of Modern Languages, Islamabad
Saima Zaheer	National University of Modern Languages, Islamabad
Sajjad Ghauri	ISRA University, Islamabad
Sana Aurangzeb	National University of Modern Languages, Islamabad
Shumaila	National University of Modern Languages, Islamabad
Sumaira Nazir	National University of Modern Languages, Islamabad
Tehseen Hussain	National University of Modern Languages, Islamabad
Touseef Javed	National University of Modern Languages, Islamabad
Umar Farooq	College of Elect & Mech. Engineering, NUST, Rawalpindi
Umer Haroon	National University of Modern Languages, Islamabad
Wajiha Mughal	National University of Modern Languages, Islamabad
Zainab Yousuf	National University of Modern Languages, Islamabad
Zakia Jalil	International Islamic University, Islamabad

List of Participants

Abdul Rehman	National University of Modern Language, Islamabad
Ali Raza	National University of Modern Language, Islamabad
Ammarah Arooj	MCS - National University of Sciences & Technology, Rawalpindi
Awab M.	National University of Sciences & Technology, Islamabad
Bilal Raza	National University of Modern Languages, Islamabad
Faiz Alam	Northwestern Polytechnical University, Xi'an, China
Hafiz Sheraz	Air University, Islamabad
Hafsa Ahmad	National University of Sciences & Technology, Islamabad
Hina Ali	National University of Modern Language, Hyderabad
Isma Hamid	National Textile University, Faisalabad
Khan Farhan	Air University, Islamabad
Mehak Faryal	University of Engineering & Technology, Taxila
M. Ayaz Khan	Air University, Islamabad
M. Mudassir	National University of Sciences & Technology, Karachi
M. Shan Saleem	University of Engineering & Technology, Taxila
M. Zeeshan	Air University, Islamabad
Neelofer Memon	Mehran University of Engineering & Technology, Jamshoro
Qundeel Baber	Air University, Islamabad
Sehrish Qais	Air University, Islamabad
Waseem Abbas	National University of Science & Technology, Islamabad
Zubaira Naz	University of Engineering & Technology, Lahore
Zubaira Naz	University of Engineering & Technology, Lahore

Information & Statistics

The second edition of International Conference on Engineering & Computing Technologies (ICECT-2022) received 49 submissions this year. The submissions cover novel and innovative research work related to modern trends pertaining to computer sciences, engineering and related disciplines.

Each submission was peer reviewed by subject experts/researchers. After considering the recommendations and comments of the reviewers, Accept/Reject decisions on the submissions were made. In total 24 research papers were accepted for the conference with an acceptance rate of 48.9%.

Book of Abstracts [1]

Prepared and Edited by [2]

Dr. Sajid Saleem
Assistant Professor – Electrical Engineering
Faculty of Engineering & Computer Sciences – FE&CS
Technical Program Committee – Co-Chair – ICECT–2022
Manager Research - Center for Multidisciplinary Research – CMR
National University of Modern Languages – NUML, Islamabad – Pakistan.