2021 International Conference on Frontiers of Information Technology (FIT 2021)

Islamabad, Pakistan **13 – 14 December 2021**



IEEE Catalog Number: CFP2174R-POD **ISBN:**

978-1-6654-0831-8

Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP2174R-POD
ISBN (Print-On-Demand):	978-1-6654-0831-8
ISBN (Online):	978-1-6654-0830-1

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400 Fax: (845) 758-2633 E-mail: curran@proceedings.com Web: www.proceedings.com



2021 International Conference on Frontiers of Information Technology (FIT) **FIT 2021**

Table of Contents

Message from the General Chair	xiii
Message from the Program Chair	xiv
Organizing Committee	
Program Committee	
Reviewers	xix
Sponsors	xxiv

Session 1: Software Engineering

ISP can Identify YouTube Videos that you Just Watched1 Muhammad U. S. Khan (COMSATS University Islamabad, Pakistan), Syed M. A. H. Bukhari (COMSATS University Islamabad, Pakistan), Shazir A. Khan (COMSATS University Islamabad, Pakistan), and Tahir Maqsood (COMSATS University Islamabad, Pakistan)
 Detection of Energy Bugs in Android Applications: A Systematic Literature Review
Software Requirements Prioritization in the Context of Global Software Development

(HITEC University, Pakistan), Farwah Aizaz (COMSATS University Islamabad, Pakistan), and Mansoor Ahmed (COMSATS University Islamabad, Pakistan)

Session 2: Pattern Recognition, Image & Natural Language Processing

Deep Learning Based Intelligent Emotion Recognition and Classification System
Misha Urooj Khan (University of Engineering and Technology, Pakistan),
Zubair Saeed (University of Engineering and Technology, Pakistan), Ali
Raza (University of Engineering and Technology, Pakistan), Muhammad
Abdullah Abbasi (Barani Institute of Management Sciences Rawalpindi,
Pakistan), Muneeb Asif (University of Engineering and Technology,
Pakistan), and Urooj Urooj (University of Engineering and Technology,
Pakistan)
Understanding the Role of Political Micro-Influencers in Pakistan
Soufia Kausar (University of Engineering and Technology, Pakistan),
Bilal Tahir (University of Engineering and Technology, Pakistan), and
Muhammad Amir Mehmood (University of Engineering and Technology,
Pakistan)

Session 3: Data Science & Advanced Analytics

 Prediction of Covid-19 and Post Covid-19 Patients with Reduced Feature Extraction using Machine Learning Techniques
 Forecasting Stock Market using Machine Learning Approach Encoder-Decoder ConvLSTM 43 <i>Khurum Iqbal (National University of Sciences and Technology,</i> <i>Pakistan), Ali Hassan (National University of Sciences and Technology,</i> <i>Pakistan), Syed Shah Mir Ul Hassan (National University of Sciences</i> <i>and Technology, Pakistan), Shuaib Iqbal (National University of</i> <i>Sciences and Technology, Pakistan), Faheem Aslam (Commission on</i> <i>Science and Technology for Sustainable Development in the South</i> <i>University, Pakistan), and Khurrum S Mughal (Senior Research Fellow</i> <i>Islamabad Policy Research Institute, Pakistan)</i>
 Population Initialization of Seagull Optimization Algorithm with Pseudo Random Numbers for Continous Optimization

Session 4: Water Informatics and Communication Technology

. 55
. 61

A Survey of Indian Ocean Region Maritime Security: Technological Advancements and	
Innovative Solutions	. 66
Muhammad Asim Ismail (Center of Excellence in Science and Technology,	
Pakistan), Shahid Ali (Center of Excellence in Science and Technology,	
Pakistan), Sartaj Khan (Center of Excellence in Science and	
Technology, Pakistan; College of Underwater Acoustic Engineering,	
China), Zeeshan Babar (Center of Excellence in Science and Technology,	
Pakistan), and Muhammad Mazhar (Center of Excellence in Science and	
Technology, Pakistan)	

Session 5: Smart Grid, Energy & Electronics

Short Term Hybrid PV/Wind Power Forecasting for Smart Grid Application using Feedforward Neural Network (FNN) Trained by a Novel Atomic Orbital Search (AOS) Optimization Algorithm 72 Muhammad Hamza Zafar (Canital University of Science and Technology

Pakistan), Noman Mujeeb Khan (Capital University of Science and Pakistan), Noman Mujeeb Khan (Capital University of Science and Technology, Pakistan), and Umer Amir Khan (Capital University of Science and Technology, Pakistan)	
 Performance Evaluation of Third Harmonic Injection PWM Technique for Three Phase Multilevel Inverter	
Power Quality Enhancement Employing A Novel Variable Frequency Drive Regulated Harmonic Mitigation Technique	
A Data Driven Approach For Optimal Coordination of Overcurrent Relay	
Nanostructures for Enhancing the Performance of thin Film Solar Cells	

Session 6: Pattern Recognition, Image & Natural Language Processing

Attention Convolutional U-Net for Automatic Liver Tumor Segmentation Asima Bibi (University of Engineering and Technology, Pakistan) and Muhammad Salman Khan (University of Engineering and Technology, Pakistan)	102
Automated Localization and Segmentation of Left Ventricle in Cardiac MRI using Faster R-CNN	108
Nauman Qadeer (COMSATS University Islamabad, Pakistan), Jamal Hussain	
Shah (COMSATS University Islamabad, Pakistan), and Muhammad Sharif	
(COMSATS University Islamabad, Pakistan)	

Sahar Gull (Riphah International University, Pakistan), Shahzad Akbar
(Riphah International University, Pakistan), and Khadija Safdar
(Riphah International University, Pakistan)

An Automated Deep Learning Approach to Diagnose Glaucoma using Retinal Fundus Images 120

Ayesha Shoukat (Riphah International University, Pakistan), Shahzad Akbar (Riphah International University, Pakistan), Syed Al E Hassan (Riphah International University, Pakistan), Amjad Rehman (Prince Sultan University, Saudi Arabia), and Noor Ayesha (Zhengzhou University, China)

DefenseNet- A Resilent Network Against Adverserail Attacks On Recommendation Systems .. 126 Qurat Ul Ain (University of Engineering and Technology, Pakistan), Nudrat Nida (National University of Science and Technology, Pakistan), and Syed Aun Irtaza (University of Engineering and Technology, Pakistan)

Session 7: Signal Processing and Next Generation Communication Systems

Automatic Classification of Lung Sounds using Machine Learning Algorithms
Classification of Eye Diseases and Detection of Cataract using Digital Fundus Imaging (DFI) and Inception-V4 Deep Learning Model
A Single Laser and Fiber Based Duplex Data Transmission to Multiple Users in a Passive Optical Link
Automatic Speaker Verification and Replay Attack Detection System using Novel Glottal Flow Cepstrum Coefficients
Pilot-Aided Estimation of Millimeter Wave Sparse Massive MIMO Channels using Neural Networks

Session 8: Adaptive Systems, Networks, IoT & Cloud Computing

Evaluation of Packet Concatenation Mechanisms for Low Power Devices in Industrial Internet of Things
(Sindh Institute of Management and Technology, Pakistan)
IoT-Based Formal Modelling of Emergency Message Dissemination Scheme for VANETs 164 Sidra Iqbal (COMSATS University Islamabad, Pakistan), Nazir Ahmad Zafar (COMSATS University Islamabad, Pakistan), and Tariq Ali (COMSATS University Islamabad, Pakistan)
Algorithm-Based Dynamic Formal Model for Forest Fire Detection & Extinguishment System . 170 Aqsa Tehseen (COMSATS University Islamabad, Pakistan), Nazir Ahmad Zafar (COMSATS University Islamabad, Pakistan), and Tariq Ali (COMSATS University Islamabad, Pakistan)
IoT Sensor Systems Mapping Quality Parameters using Cloud Computing
An Energy-Efficient Cluster Based Routing Algorithm for Wireless Sensor Network

Session 9: Software Engineering

 An Empirical Investigation on Cost Estimation Challenges in Agile Software Development (ASD) Context
An Empirical Investigation on Software Cost Estimation Techniques and Barriers on Agile
Software Development in Software Industry of Pakistan 194
Farwah Aizaz (COMSATS University Islamabad, Pakistan), Uzair Iqbal
Janjua (COMSATS University Islamabad, Pakistan), Haroon Zafar (Riphah
International University, Pakistan), Junaid Ali Khan (HITEC
University, Pakistan), and Irfan Kazim (COMSATS University Islamabad,
Pakistan)
 When Business Process Re-Engineering Meets Industry 4.0: A Concept Paper

Session 10: Pattern Recognition, Image & Natural Language Processing

 HashCat: A Novel Approach for the Topic Classification of Multilingual Twitter Trends Soufia Kausar (University of Engineering and Technology, Pakistan), Bilal Tahir (University of Engineering and Technology, Pakistan), and Muhammad Amir Mehmood (University of Engineering and Technology, Pakistan) 	212
Automatic Detection of Exudates for Daignosis of Non-Proliferative Diabetic Retinopathy using Region-Based Convolutional Neural Networks	. 218

Session 11: Smart Grid and Signal Processing

Solar Power Assisted Passive and Active Cell Balancing System: A Comprehensive Analysis 224 Muhammad Hassan (Comsats University Islamabad, Pakistan), Muhammad Jawad (Comsats University Islamabad, Pakistan), Nisma Saleem (Comsats University Islamabad, Pakistan), Ali Raza (Comsats University Islamabad, Pakistan), Khurram Zaidi (Comsats University Islamabad, Pakistan), and Nadeem Rafiq (Comsats University Islamabad, Pakistan)
Microwave Linear Polarization Chiral Rotator with Asymmetric Transmission
Aisha Bibi (COMSATS University Islamabad, Pakistan), Muhammad Ismail
Khan (COMSATS University Islamabad, Pakistan), and Imdad Khan (COMSATS

University Islamabad, Pakistan)

Session 13: Network, Cyber & Information Security

Automated Analysis of Pakistani Websites' Compliance with GDPR and Pakistan Data Protection Act
Malware Detection in Android via Neural Network using Entropy Features
Malware Detection and Classification Along with Trade-off Analysis for Number of Features, Feature Types, and Speed 246 Duaa Baig (Salim Habib University, Pakistan), Muhammad U.S. Khan 246 (COMSATS University Islamabad, Pakistan; University of Eastern 7 Finland, Finland), Darren Dancey (Manchester Metropolitan University, 100 UK), Assad Abbas (COMSATS University Islamabad, Pakistan), and Raheel Nawaz (Manchester 7 Metropolitan University, UK) 7
Critical Analysis of Internet Country Code Top-Level Domain (ccTLD) of Pakistan

Session 14: Pattern Recognition, Image & Natural Language Processing

Deep Features Comparative Analysis for COVID-19 Detection from the Chest Radiograph Images. 258 Naeem Ullah (University of Engineering and Technology, Pakistan) and Ali Javed (University of Engineering and Technology, Pakistan)
Plant Disease Identification and Classification using Convolutional Neural Network and 264 SVM. 264 Hareem Kibriya (University of Engineering and Technology, Pakistan), 264 Iram Abdullah (HITEC University, Pakistan), and Amber Nasrullah (University of Wah, Pakistan)
A New Technique for Reducing the Segmentation Error of Left Ventricle Contours using Magnetic Resonance Images
Text Understanding form Natural Images with Enhanced Classification using Genetic 275 Algorithm 275 Ghulam Jillani Ansari (University of Education, Pakistan), Jamal 100 Hussain Shah (COMSATS University, Pakistan), and Muhammad Sharif (COMSATS University, Pakistan)

Session 15: Modeling & Simulation for Emerging Technologies

Classical Adversarial Attack on mm-Wave FMCW Radar
Agent-Based Modeling and Simulation in the Analysis of e-Commerce Market
 Analysis of Future Probabilistic Placement of Electric Vehicle Chargers on Real Residential Feeder
Design and Analysis of a Novel Dual Stator Tubular Moving Magnet Linear Actuator for Compressor Application

Session 16: Data Science and Pattern Recognition

Predictive Analysis of Autism Spectrum Disorder (ASD) using Machine Learning
Optimal Scenario Mining for Business Strategy Decision-Making Through Process Mining 311 Yuri van Midden (University of Twente, The Netherlands), Jeewanie Jayasinghe Arachchige (University of Ruhuna, Sri Lanka), and Faiza Allah Bukhsh (University of Twente, The Netherlands)
A Smart Technique to Forecast Karachi Stock Market Share-Values using ARIMA Model 317 Rana M. Amir Latif (COMSATS University Islamabad, Pakistan), Muhammad Rehan Naeem (University of Engineering and Technology Taxila, Pakistan), Osama Rizwan (COMSATS University Islamabad, Pakistan), and Muhammad Farhan (COMSATS University Islamabad, Pakistan)
Emotion Recognition Based on Musical Instrument using Deep Neural Network

Author Index.	 	 	