

# NEWSLETTER

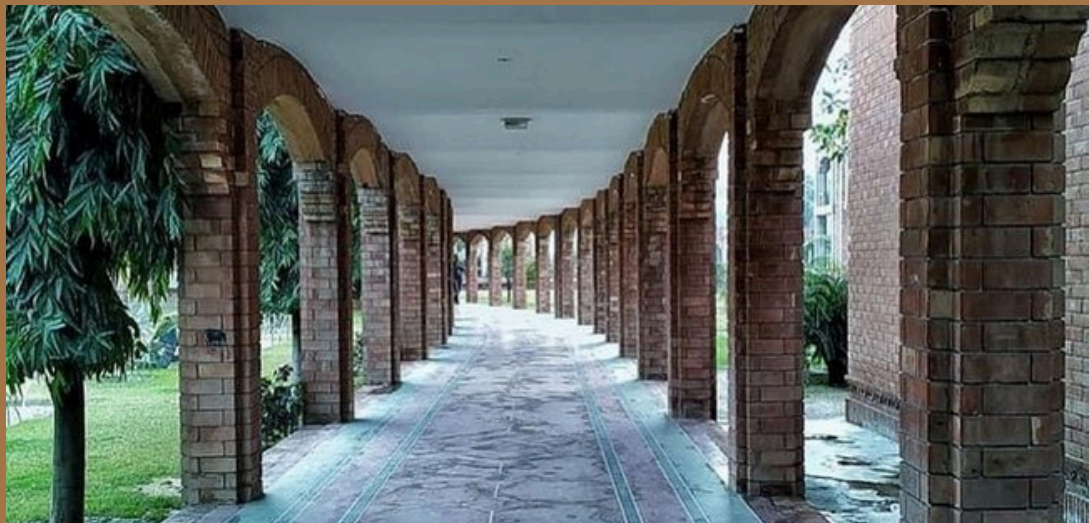
ELECTRICAL AND COMPUTER  
ENGINEERING DEPARTMENT

FALL 2023



## What's inside this issue:

- Seminars and Workshops
- Safe Evacuation Drill in Emergency
- Annual Student Branch Orientation
- Annual Meeting of IEEE WIE
- Welcome Party
- Research Publications
- Funded Projects



# Message from the Director

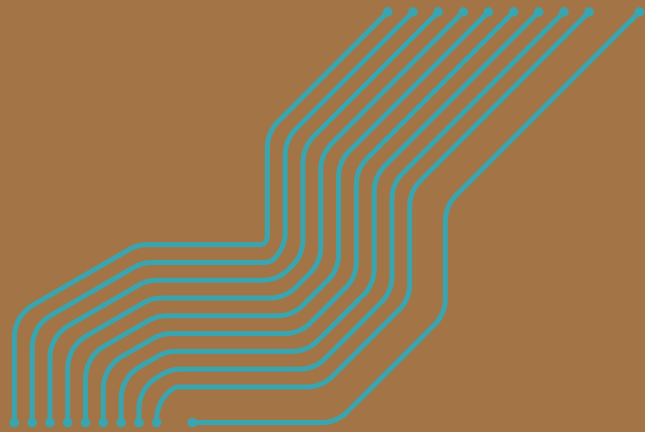


## Prof. Dr. Syed Asad Hussain

Director CUI, Lahore

I welcome you on behalf of the faculty and staff. These are exciting times for electrical and computer engineers as the discipline is now widely recognized as an essential source of tools and techniques for advancements in nearly all spheres of human endeavor. Our students get competitive skills in effective development and application of modern technology. We see our students as excellent engineers, outstanding researchers, extra ordinary analysts, and innovative designers. We are aware of everyday breakthroughs in modern technology and committed to equip our

students with advanced competencies required to manage the growing needs of sciences and technology; in almost every professional field today. Research activities have been given high priority within the department resulting in a high quality of research publications. The Department of Electrical and Computer Engineering offers competitive degrees in rapidly expanding areas of study. Our qualified faculty and excellent facilities ensure that students have a solid technical grasp on different subjects to apply this knowledge in practical work settings. Our prolific linkages with the Higher Education Commission, Ministry of Science and Technology and leading universities of the world help us keep up-to-date with new policy initiatives and market driven incentives being unrolled by the government and private sectors.

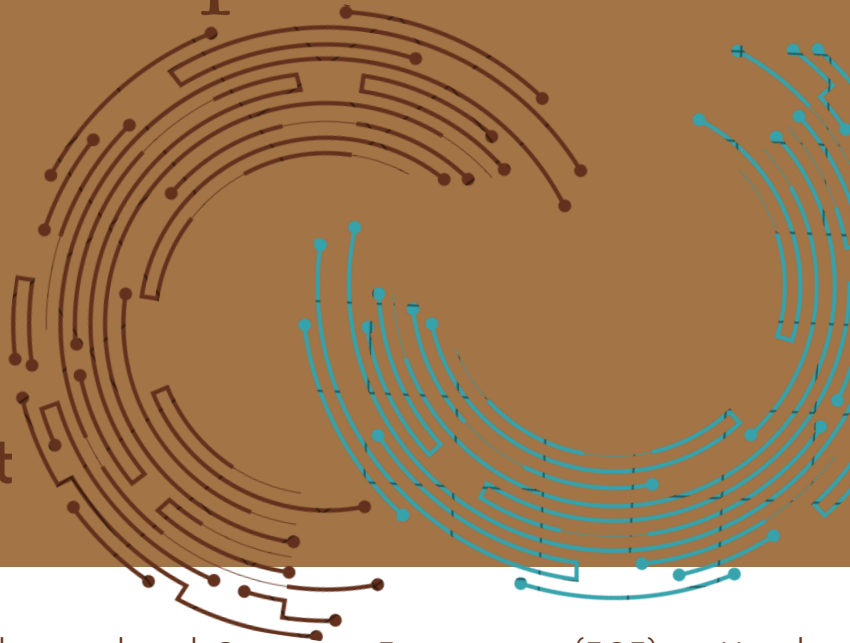






# Message from the Head of Department

**Engr. Dr. Ejaz A. Ansari**  
**Head of the Department**



I feel honored to lead the Department of Electrical and Computer Engineering (ECE) as Head and welcome all newly admitted students in various programs of the department at both undergraduate and graduate levels in Fall 20 and SP 21 semesters. Electrical and Computer Engineering (ECE) is one of the largest departments of COMSATS University Islamabad (CUI), Lahore Campus and occupies a central place in major activities at the campus. We are striving to achieve this objective by imparting rigorous and quality education to our stellar students and engaging our faculty and research groups in the cutting edge fields of the research. The degree programs offered at the department have a balanced mix of theory and practical work in the laboratories. The theory courses are taught by our excellent, highly qualified and trained faculty. For the practical work, the department has a number of laboratories with the services of dedicated Lab Engineers which are fully equipped with modern and state of the art tools needed by the undergraduate and graduate students to learn, practice and enhance their practical skills towards engineering education. All the degree programs currently being offered both at undergraduate and graduate levels are recognized by the Higher Education Commission (HEC), Islamabad Pakistan and Pakistan Engineering Council (PEC), Islamabad.

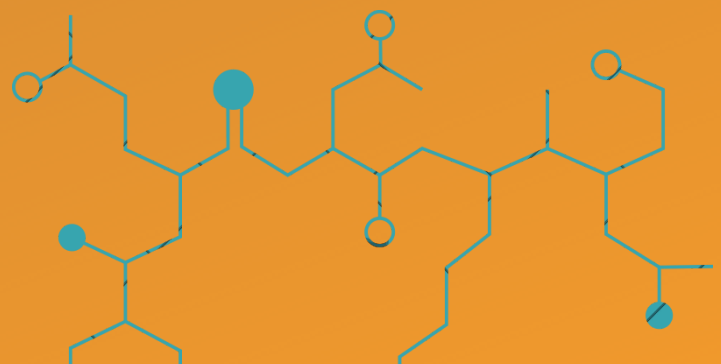
Our graduate students currently enrolled in Master's and PhD degree programs are very much involved in carrying out research activities with these research groups under the guidance of their research Supervisor towards pursue of their degrees. Our students and faculty are fully committed in making all the possible efforts to play the due role in minimizing the adverse effects of the global Corona-virus pandemic and bring to the forefront new technologies and pedagogies to achieve our goals.

I would like to assure the parents of our students that Department will take all possible steps to ensure the safety and well being of our students currently enrolled at our various programs. We (the faculty) are also deeply committed to inculcate in our graduates the essential skills and professional talent that helps them to meet the needs of the fourth industrial revolution as well as impart industry and market relevant education which may bring laurels to their adopted future careers.

In conclusion, please join us on our exciting journey into realizing your highest potential towards becoming academic leaders in Pakistan and South-East Asia . I pray to Almighty Allah (SWT) for assistance in our future endeavors and look forward towards glorious achievements in the times to come with our team work efforts.

# Seminars and Workshops

- The Collaboration and Outreach Committee, Electrical and Computer Engineering Department, CUI Lahore Campus, arranged a seminar on an effective way to write literature survey for the final-year project (FYP) report. Dr. Usman Iqbal, Lecturer, ECE Department, presented the seminar and thoroughly described the methodology. The event was organized on Dec. 15, 2023, for the students of Bachelors of Science in Computer Engineering and Bachelors of Science in Electrical Engineering.
- The Collaboration and Outreach Committee, Electrical and Computer Engineering Department, CUI Lahore Campus, arranged a seminar on solar energy, offered by DSG Energy. DSG Energy is Pakistan's leading solar energy company providing solutions in renewable energies to customers. The event was organized on Oct. 25, 2023, for the students of Bachelors of Science in Computer Engineering and Bachelors of Science in Electrical Engineering. Representatives from the DSG Energy described the current trends and future of solar power in Pakistan and potential career opportunities in this field for the graduates.





# Seminars and Workshops

- The Collaboration and Outreach Committee, Electrical and Computer Engineering Department, CUI Lahore Campus, arranged a seminar titled "Design of Embedded Systems Hardware and Software with their Challenges and Applications" for the students of Bachelors of Science in Computer Engineering and Bachelors of Science in Electrical Engineering on Nov. 30, 2023. Presenter Engr. Talha Naveed described the role of embedded systems, their design flow, role of embedded software in modern life and its future perspectives.



- The Collaboration and Outreach Committee, Electrical and Computer Engineering Department, CUI Lahore Campus, organized a seminar titled "Mobile Application Development for Engineers using MIT APP Inventor" for the engineering students of FA20 and FA21 on October 4th, 2023. This seminar/workshop primarily focused on the 6th and 7th semester students to facilitate them to develop mobile apps for their final-year projects (FYPs) and semester projects. The Seminar was conducted by Mr. M. Hassan Aslam, Lecturer ECE, CUI, Lahore.



- The Collaboration and Outreach Committee, Electrical and Computer Engineering Department, CUI Lahore Campus, organized a seminar titled "Sparkling Women's Leadership in Energy" for the female students of FA20-ECE on Sep. 27, 2023. Objective of this event was to help female students gain hands-on experience and skills to enter the job market successfully.





## Safe Evacuation Drill in Emergency

A drill on "Safe Evacuation from a Building in case of an Emergency" was arranged by the Health and Safety Committee of Electrical and Computer Engineering (ECE) department with support of Security and Safety Department of CUI Lahore Campus on 13th Dec. 2023 at 12 PM in the ECE Dept.

The purpose of this drill was to make students, staff, and faculty aware about making a safe exit from a building/workplace in case of an earthquake, fire, or any other calamity. Students, staff, and faculty physically participated in this drill and strictly observed the procedure and guidelines mentioned in the relevant SOP.

In-charge Security, Col. Shahzad Anwar and his team supervised this drill, and he rated the exercise as "satisfactory".







## Workshop on Embedded System Design



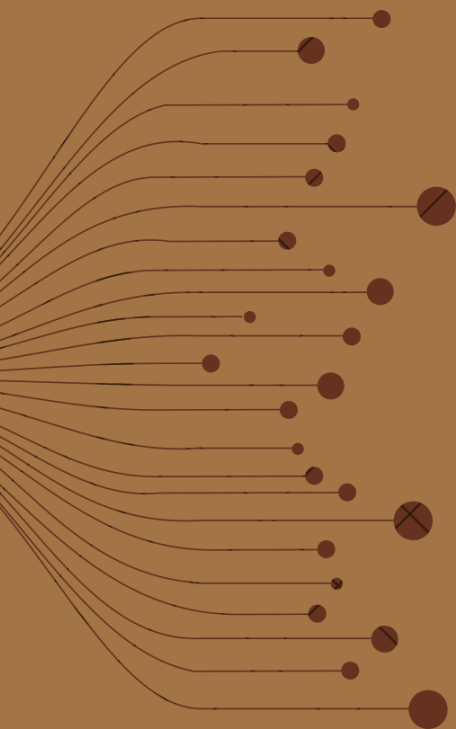
Design of Embedded System Hardware and Software with Their Challenges and Applications

November 30, 2023

IEEE CUI Lahore organized a workshop "Design of Embedded System Hardware and Software with Their Challenges and Applications" on 30th November 2023 especially designed for Final Year Project students and those who are interested in a career in embedded systems. Engr. Talha Naveed, an Alumnus of ECE CUI Lahore and an Embedded System Engineer at AMS-IoT was the speaker/trainer in this workshop. The workshop mainly comprised of two sessions. In the first session the speaker delivered an insightful talk on the design challenges and applications in the field of embedded systems for young engineers. The next session was completely hands-on in which the students learnt Altium PCB design software that is commonly used in industry.

At the end of the workshop Dr. Zaid Ahmad, Branch Counsellor of IEEE CUI Lahore thanked the speaker and all the student organizers. Dr. Ejaz A. Ansari, Head ECE CUI Lahore presented a certificate to the speaker Engr. Talha Naveed and delivered a short motivational talk to the final year students.





## Prototyping IoT Hardware December 20, 2023

This workshop targeted Internet of Things (IoT) enthusiasts and developers to learn how to develop prototypes and build hardware solutions for IoT applications. The workshop involved understanding and operations of sensors, microcontrollers and connectivity modules using Altium software.





# Annual Student Branch Orientation



Annual orientation of IEEE CUI Lahore was held on 21st December 2023. The advisor of the branch Dr. Zaid Ahmad delivered welcomed all the participants. Representatives of IEEE Lahore Section including Prof. Dr. Amjad Hussain Shah, Former Chair IEEE Lahore Section, Syed Muhammad Rizwan, Chair Student Activities Committee, IEEE Lahore Section and Mr. Hamza Ehtisham, Chair Young Professionals, IEEE Lahore Section were invited to join in an interactive session with IEEE Volunteers and newly selected Executive Committee members of IEEE CUI Lahore Student Branch and Women in Engineering (WIE) Affinity Group. Former Branch Counsellor Prof. Dr. Sobia Baig was also invited to encourage the new Executive Committees in her motivation address. All the IEEE volunteers are now supercharged to organize various events in 2024.



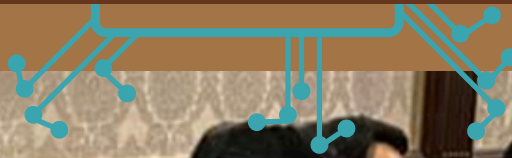




Advisor of IEEE CUI Lahore Dr. Zaid Ahmad was invited by Ms. Anum Tariq, Chair of Women in Engineering (WIE) Affinity Group, IEEE Lahore Section to their Annual Meeting held at DeSOM Services Club on 15th December 2023. The chair reflected on the accomplishments of 2023 and discussed the event plan of 2024. At the end of the meeting, the chair expressed her gratitude to all participants from various student branches, IEEE Lahore Section and IEEE Faisalabad Subsection.



## ANNUAL MEETING OF IEEE WIE





# Welcome Party

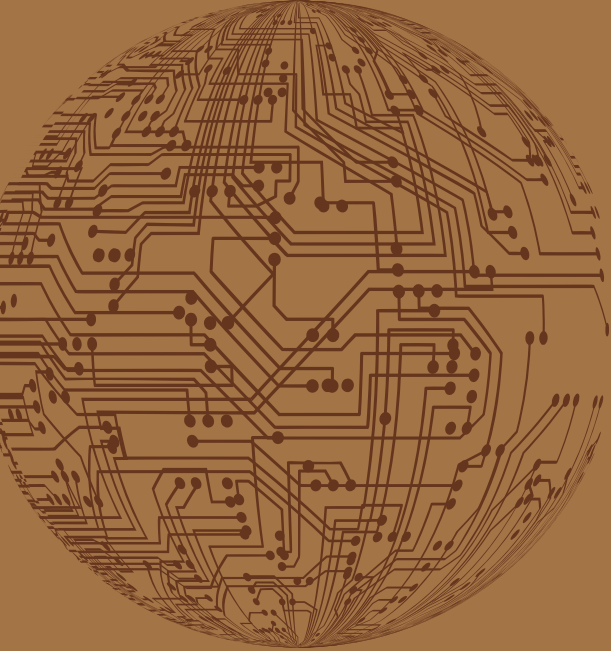


A magnificent welcome party has been arranged at the ECE department to welcome the new batch of electrical and computer engineering programs. The prime objective of the party is to provide an informal way of interaction to the new students with the seniors and the faculty members. The grand party was organized by the FA20 batch of electrical and computer engineering programs on December 13 and 14, 2023.



The head of the ECE department, Dr. Ejaz A. Ansari, program incharges, Dr. Asim Ali Khan, Dr. Naeem Awais, and several faculty members graced the event on both days. The party was full of fun, music, and performances by the seniors. The welcome party ended with a delicious dinner.





# Research Publications

- [1] Naseem, T., Javed, A., Hamayun, M. T., Jawad, M., Ansari, E. A., Fayyaz, M. A., ... & Nawaz, R. (2023). Design of an EnergyPlus model-based smart controller for maintaining thermal comfortable environment in non-domestic building. *IEEE Access*, 11, 33134-33147.
- [2] Akhtar, S., Nadeem, M., Rashdan, M., Hussain, B., Ansari, E. A., & Aslam, M. H. (2023). Online Mode of Teaching and Learning Process in Engineering Discipline: Teacher Perspective on Challenges Faced and Recommendations. *Education Sciences*, 13(2), 200.
- [3] Iqbal, M. U., Ansari, E. A., Akhtar, S., Rafiq, M. N., Farooq-i-Azam, M., & Hassan, B. (2023). Hybrid Learning based Radio Resource Management in 5G Heterogeneous Networks. *Pakistan Journal of Engineering and Technology*, 6(1), 92-97.
- [4] Iqbal, M. U., Ansari, E. A., Akhtar, S., Farooq-i-Azam, M., Hassan, S. R., & Asif, R. (2023). Optimal learning paradigm and clustering for effective radio resource management in 5G HetNets. *IEEE Access*.
- [5] Arshad, R., Farooq-i-Azam, M., Muzzammel, R., Ghani, A., & See, C. H. (2023). Energy efficiency and throughput optimization in 5g heterogeneous networks. *Electronics*, 12(9), 2031.
- [6] Asif, R., Farooq-i-Azam, M., Chaudary, M. H., Husen, A., & Hassan, S. R. (2023). A distance vector hop-based secure and robust localization algorithm for wireless sensor networks. *Electronics*, 12(10), 2237.
- [7] Farooq-i-Azam, M., Siddiq, A., & Iqbal, M. U. (2023). Probability Distribution of Transient Response of an Electric Circuit. *Pakistan Journal of Engineering and Technology*, 6(2), 1-8.
- [8] Farooq-i-Azam, M., Khan, Z. H., Ghani, A., & Siddiq, A. (2023). An Investigation of the Transient Response of an RC Circuit with an Unknown Capacitance Value Using Probability Theory. *Symmetry*, 15(7), 1378.
- [9] Farooq, M. S., Khalid, H., Arooj, A., Umer, T., Asghar, A. B., Rasheed, J., ... & Yahyaoui, A. (2023). A conceptual multi-layer framework for the detection of nighttime pedestrian in autonomous vehicles using deep reinforcement learning. *Entropy*, 25(1), 135.
- [10] Awan, M. M. A., Asghar, A. B., Javed, M. Y., & Conka, Z. (2023). Ordering technique for the maximum power point tracking of an islanded solar photovoltaic system. *Sustainability*, 15(4), 3332.
- [11] Xiao, G., Gao, X., Lu, W., Liu, X., Asghar, A. B., Jiang, L., & Jing, W. (2023). A physically based air proportioning methodology for optimized combustion in gas-fired boilers considering both heat release and NOx emissions. *Applied Energy*, 350, 121800.

# Research Publications

- [12] Shehzad, M. F., Asghar, A. B., Jaffery, M. H., Naveed, K., & Čonka, Z. (2023). Neuro-fuzzy system based proportional derivative gain optimized attitude control of CubeSat under LEO perturbations. *Heliyon*, 9(10).
- [13] Asghar, A. B., Majeed, M., Taseer, A., Khan, M. B., Naveed, K., Jaffery, M. H., & Ejsmont, K. (2023). Comparative Performance Analysis of Machine Learning Algorithms for Arm and Shoulder Exercises using Wrist-worn Band. *IEEE Access*.
- [14] Mughees, N., Jaffery, M. H., Mughees, A., Ansari, E. A., & Mughees, A. (2023). Reinforcement learning-based composite differential evolution for integrated demand response scheme in industrial microgrids. *Applied Energy*, 342, 121150.
- [15] Azeem, F., Memon, Z. A., Baig, S., Manzoor, T., Abbas, F., & Shah, M. A. (2023). A novel automated demand response control using fuzzy logic for islanded battery-operated rural microgrids. *IET Renewable Power Generation*, 17(7), 1797-1811.
- [16] Moreira, T. F., Camponogara, Â., Baig, S., & Ribeiro, M. V. (2023). Performance analysis of orthogonal multiplexing techniques for PLC systems with low cyclic prefix length and symbol timing offset. *Sensors*, 23(9), 4363.
- [17] Hassan, B., Baig, S., & Aslam, S. (2023). On Scalability of FDD-Based Cell-Free Massive MIMO Framework. *Sensors*, 23(15), 6991.
- [18] Sipra, A. T., Azeem, F., Memon, Z. A., Baig, S., & Jaffery, M. H. (2024). Design and assessment of energy management strategy on rail coaches using solar PV and battery storage to reduce diesel fuel consumption. *Energy*, 288, 129718.
- [19] Azeem, F., Memon, Z. A., Baig, S., & Awan, A. B. (2023). A two-way pre-installation assessment framework for microgrids under power systems expansion planning. *Sustainable Energy Technologies and Assessments*, 55, 102920.
- [20] Zafar, M., Awais, N., Shehzad, M. N., Maqsood, A., & Razzak, A. (2023). Phenomenological modeling of memristor fabricated through screen printing based on the structure of Ag/Polymer/Cu.
- [21] Butt, H., Khosa, I., & Iftikhar, M. A. (2023). Feature transformation for efficient blood glucose prediction in type 1 diabetes mellitus patients. *Diagnostics*, 13(3), 340.
- [22] Khosa, I., Rahman, A., Ali, K., Akhtar, J., Armghan, A., Arshad, J., & Amentie, M. D. (2023). Fault-Level Grading of Photovoltaic Cells Employing Lightweight Deep Learning Models. *Computational Intelligence and Neuroscience*, 2023.
- [23] Khosa, I., Raza, A., Anjum, M., Ahmad, W., & Shahab, S. (2023). Automatic Diabetic Foot Ulcer Recognition Using Multi-Level Thermographic Image Data. *Diagnostics*, 13(16), 2637.
- [24] Perveen, G., Ali, S. F., Ahmad, J., Shahab, S., Adnan, M., Anjum, M., & Khosa, I. (2023). Multi-Stream Deep Convolution Neural Network With Ensemble Learning for Facial Micro-Expression Recognition. *IEEE Access*.



# Research Publications

- [25] Jawad, M., Asghar, H., Arshad, J., Javed, A., Qureshi, M. B., Ali, S. M., ... & Rassölkin, A. (2023). A novel renewable powered stand-alone electric vehicle parking-lot model. *Sustainable Energy, Grids and Networks*, 33, 100992.
- [26] Arshad, J., Ashraf, M. A., Asim, H. M., Rasool, N., Jaffery, M. H., & Bhatti, S. I. (2023). Multi-mode electric wheelchair with health monitoring and posture detection using machine learning techniques. *Electronics*, 12(5), 1132.
- [27] Arshad, J., Siddiqui, T. A., Sheikh, M. I., Waseem, M. S., Nawaz, M. A. B., Eldin, E. T., & Rehman, A. U. (2023). Deployment of an intelligent and secure cattle health monitoring system. *Egyptian Informatics Journal*, 24(2), 265-275.
- [28] Asghar, A. B., Majeed, M., Taseer, A., Khan, M. B., Naveed, K., Jaffery, M. H., & Ejsmont, K. (2023). Comparative Performance Analysis of Machine Learning Algorithms for Arm and Shoulder Exercises using Wrist-worn Band. *IEEE Access*.
- [29] Al-Atawi, A. A., Alyahyan, S., Alatawi, M. N., Sadad, T., Manzoor, T., Farooq-i-Azam, M., & Khan, Z. H. (2023). Stress Monitoring Using Machine Learning, IoT and Wearable Sensors. *Sensors*, 23(21), 8875.
- [30] Naeem, T., Kim, J., Khaliq, H. S., Seong, J., Chani, M. T. S., Tauqeer, T., ... & Rho, J. (2023). Dynamic chiral metasurfaces for broadband phase-gradient holographic displays. *Advanced Optical Materials*, 11(5), 2202278.
- [31] Haider, S., Ali, S., Ahmad, M., Saleem, K., & Mokhtar, R. M. (2022). Model Reduction of Unstable Discrete Time Generalized Second Orderly-form Systems with Structure Preservation. *Technical Journal*, 27(04), 9-19.
- [32] Ahmad, M., & Mohd-Mokhtar, R. (2023). Adaptive Threshold-based Fault Detection for Systems Exposed to Model Uncertainty and Deterministic Disturbance. *Pertanika Journal of Science & Technology*, 31(6).
- [33] Ahmad, Z., Hashim, S. J., Ferre, G., Rokhani, F. Z., Al-Haddad, S. A. R., & Sali, A. (2023). LoRa and rotating polarization wave: Physical layer principles and performance evaluation. *IEEE Access*, 11, 14892-14905.
- Chicago
- [34] Ali, M. M., Hashim, S. J., Chaudhary, M. A., Ferré, G., Rokhani, F. Z., & Ahmad, Z. (2023). A Reviewing Approach to Analyze the Advancements of Error Detection and Correction Codes in Channel Coding With Emphasis on LPWAN and IoT Systems. *IEEE Access*, 11, 127077-127097.
- [35] Ijaz, S., Galea, M., Hamayun, M. T., Ijaz, H., & Javaid, U. (2023). A new output integral sliding mode fault-tolerant control and fault estimation scheme for uncertain systems. *IEEE Transactions on Automation Science and Engineering*.
- [36] Farooq, M., Hayat, A., Nawaz, M. H., Hassan, M. S., Nasir, M., & Ajab, H. (2023). Tuning the structure and properties of MoS<sub>2</sub>-SrTiO<sub>3</sub> nanocomposite and its enzyme mimic behavior for enhanced optical sensing and measurement of H<sub>2</sub>O<sub>2</sub> in biological samples. *Measurement*, 216, 112901.



# Funded Projects

Sr. No.	Project Title	Supervisor	Finding Amount (PKR)	Funding Agency	Year
1	Crop Disease Detection Using IoT and Deep Learning	Dr. Aamer Bilal Asghar	100,000	Pakistan Engineering Council	2023-2024
2	Smart Glasses for Blind Using IoT and Machine Learning	Dr. Aamer Bilal Asghar	100,000	Pakistan Engineering Council	2023-2024
3	Drowsiness Detection in Drivers Using IoT and Machine Learning	Dr. Aamer Bilal Asghar	100,000	Pakistan Engineering Council	2023-2024
4	Empowering Learning: Development of Humanoid Robot for Revolutionizing STEM and AI Education in Schools	Dr. Mujtaba Hussain Jaffery	100,000	Pakistan Engineering Council	2023-2024
5	Fabrication and Commercialization of Indigenously Designed Glucometers and their Testing Strips	PI: Dr. Mian Hasnain Nawaz CoPI: Dr. Muhammad Yaqoob Javed	7144800		2023-2024



# Funded Projects

6	Integrated and Multidisciplinary Investigations and Early Warning of High-Risk Landslides Using Space, Air and Ground Based Remote Sensing	Dr. Muhammad Basharat (AJK University)/ Dr. Muhammad Farooq-i-Azam CoPI(CUI Lahore)	11787000	NCGSA/H EC	2023-2024
7	Design of Smart Online Assisted Sleeves for Rehabilitation & Assessment of Physiotherapy Treatment.	Dr. Jehanghir Arshad	80,000	Ignite NIGRI	2022-2023
8	INTELLIGENT CATTLE HEALTH MONITORING SYSTEM USING FEDERATED LEARNING, BODY AREA SENSORS, AND IOT PLATFORM'	Dr. Jehanghir Arshad	80,000	Ignite NIGRI	2022-2023
9	An IOT based Posture detection and Battery management System with Machine learning for multimode wheelchair'	Dr. Mujtaba Hussain Jaffery	80,000	Ignite NIGRI	2022-2023
10	Design and Implementation Of 5kw Induction Motor Based EV Conversion Kit for Small Hatchback Vehicle	Mr. Mian Ahmad Yaser	80,000	Ignite NIGRI	2022-2023
11	IOT Based Smart Interactive and Retrievable Shopping Cart with Billing Management System	Mr. Mian Ahmad Yaser	80,000	Ignite NIGRI	2022-2023

# Newsletter Committee



Dr. Yaqoob  
Javed



Dr. Jehangir  
Arshad



Ms. Amna  
Arif



Ms. Tabassum  
Nawaz  
Bajwa



Ms. Wajeaha  
Khan



Ms. Nisma  
Saleem



Mr. Ahmed  
Mudassir



Mr. Modassir  
Ashfaq



Mr. Rasheed  
Ali