DIRECTOR

Dr Summaira Sarfraz
Professor
PhD Approved Supervisor
PhD (Eng), AJK, Univ., Muzaffarabad (2014)
MS (Applied Ling), UMT, Lahore (2008)
MA (ELT), Kinnaird College, Lahore (1999)
MA (Eng), Univ of Punjab, Lahore (1991)

Situated in the central region of Lahore, Faisal Town, the Lahore Campus spans 12.5 acres. The four blocks that make up the campus are a noteworthy addition to Lahore's rich architectural legacy with their distinctive external brickwork and spectacular marble domes. Entire purpose-built classrooms with air conditioning and educational aids, as well as several computer and engineering labs, are the hallmarks of campus facilities. Software engineering, database, programming, and computer application laboratories are all part of the computing labs. The newest workstations, PCs, and services with environments based on Windows and Linux are easily accessible to students. The Engineering laboratories consist of the following: Digital Systems, Communications, Antenna and Microwave, Micro-processors, Embedded Controls, and Electronics. The whole campus is fully equipped with high-speed Local Area Network and latest wireless hotspots. Moreover, there is an Auditorium, Seminar Hall, Cafeteria, Girls Common Rooms, Day-Care, Medical Center, Career and Placement Office, Student Center, and International Office. In addition, Justice Gul Muhammad Library is facilitating FAST- NUCES, Lahore campus academic and research programs with prosperous information resources. FAST – NU Library is multi – discipline library having scholarly and research – oriented learning resources on Business Management, Computer Sciences, Civil Engineering, Electrical Engineering, Humani-ties, Applied Linguistics, and Mathematics. The library has more than 25000 printed books, around 400 centrally subscribed Ebscohost and Pearson e – books, a number of research Journals and Magazines, 13 HEC databases, and 10 national and international newspapers. The campus has facilities for both indoor and outdoor sports which include Football, Volleyball, Badminton, Cricket, Basketball, Lawn Tennis, Table Tennis and Jogging. In addition to the University sponsored financial assistance and scholarships, Lahore Campus also receives scholarships for meritorious students from different Boards of Intermediate and Secondary Education and Punjab Information Technology Board.

Programs offered at Lahore Campus:

- Bachelor of Business Administration
- Bachelor of Science (Accounting and Finance)
- Bachelor of Science (Business Analytics)
- Bachelor of Science (Civil Engineering)
- Bachelor of Science (Computer Science)
- Bachelor of Science (Data Science)
- Bachelor of Science (Electrical Engineering)
- Bachelor of Science (Financial Technology)
- Bachelor of Science (Software Engineering)
- Master of Business Administration
- Master of Science (Applied Linguistics)
- Master of Science (Business Analytics)
- Master of Science (Civil Engineering)
- Master of Science (Cyber Security)
- Master of Science (Computer Science)
- Master of Science (Data Science)
- Master of Science (Electrical Engineering)
- Master of Science (Mathematics)
- Master of Science (Software Engineering)
- Doctor of Philosophy (Civil Engineering)
- Doctor of Philosophy (Computer Science)
- Doctor of Philosophy (Electrical Engineering)
- Doctor of Philosophy (Management Sciences)
- Doctor of Philosophy (Mathematics)

1. Smart Networking Research Group (SNRG)

Introduction

Smart Networking Research Group (SNRG) was formally established in the year 2012 under the directorship and supervision of Dr. Saima Zafar. The primary objective of the research group is to enhance research activities in computer networks and associated emerging fields. The group has been a significant contributor to research and development in the field of network protocol design, clustering, data-center networking, pervasive and ubiquitous computing, Internet of Things (IoT) and its applications, and integration of the Internet of Things with blockchain and cloud computing, energy informatics, and health informatics. Over 20 projects and 21 theses have been completed, and PhD work is in progress. Around 40 research publications in reputed international journals and conferences are credited to this research group. A recently concluded funded project "Artificial intelligence-based real-time classification of ECG signal for diagnosis of cardiovascular disease" has won multiple competitions and has been shortlisted by Ignite.

Recent Selected Projects:

1. Internet of Things-based Smart Healthcare System
2. Internet of Things-based Smart Waste Management System
3. Load forecasting for Smart Grid using deep learning algorithms
4. Layout optimization of wireless sensor networks using meta-heuristic algorithms
5. Artificial intelligence-based real-time classification of ECG signal for diagnosis of cardiovascular disease
6. IoT and cloud computing-based energy management system for demand side management in smart grid

Collaborations

1. Dr. Ali Hammad Akbar, Chairman, Dept. of Computer Engineering UET Lahore.

Research Group Members:

1. Dr. Saima Zafar
2. Dr. Ali Hammad Akbar
3. Mr. Feroz Ahmed Mian
4. Ms. Amna Ehsan

Dr. Saima Zafar

Professor EE is Head of SNRG

2. Optical Wireless Research Centre (OWRC)

Introduction

The optical wireless research center aims to conduct cutting edge research in the field of optical wireless communication. We strive to revolutionize the way data is transmitted, leveraging the power of light waves. With the focus on optical wireless communication systems, visible light communication, Li-Fi technology, and optical wireless networking, we aim to drive innovation and create a future where fast, secure and efficient wireless communication is accessible to all. Our research aims to significantly impact various industries including telecommunication. Automotive, healthcare, underwater communication and smart cities. Main objective is to develop high speed, reliable and secure optical links by investigating novel modulation techniques, beam tracking and machine learning algorithms.

Current Project

Characterization of optical attenuation due to smog for ground-to-ground link.

Collaborations

1. Developed a collaboration with LUMS for an ongoing project.

Research Group Members:

1. Dr. S.M. Sajid
2. Mr. Ahsan
3. Ms. Azka Chaudry
4. Ms. Hira Khalid

Dr. S.M. Sajid

Professor EE is Head of OWRC

3. Power and Energy Systems research Lab (PESRL)

Introduction

The PESRL, headed by Prof. Dr. Aun Abbas, undertakes research in the field of electrical power, renewable energy, and smart grids. The theme of the research at PESRL is to discover the right approach and technologies for a "Smart Power Grid" that integrates distributed renewable generation and solves power quality issues specific to the developing nations.

Current Projects:

1. 315 KW versatile solar system designed and implemented for FAST-NUCES Lahore campus.
2. Load flow analysis of the grid data provided by MEPCO using state of the art data analytics

Collaborations

1. MEPCO

Research Group Members:

1. Dr. Syed Aun Abbas
2. Mr. Abdul Majid
3. Syed Ismail
4. Mr. Mamoon Rasheed
5. Mr. Muhammad Khalid

4. The Engineering Cybernetics Research Group (ECRG)

Introduction

The ECRG offers a platform for conducting research in the field of cybernetics focused on its applications in control engineering and robotics. The group, headed by Dr. Omer Saleem, is involved in undertaking research and senior-year projects that aim to develop robust-optimal and self-adaptive control procedures for under-actuated mechatronic systems, robots, automotive systems, healthcare and biological systems and energy-conversion systems.

The designed control systems are rigorously tested and validated by using experimental platforms; such as, mobile robots, self-balancing robots, ball-on-a-beam system, ball-on-a-plate balancing system, rotary-inverted pendulum, DC motor setup, DC-DC converters, aero-pendulums, CNC manufacturing machines, and robotic manipulators etc. The group also works in the domain of intelligent system design and its application in robotics, bio-mechatronics, and wireless sensor/actuator networks.

Projects:

1. Process Automation of Industrial unit
2. Embedded control of Field-assistive self-balancing robotic systems
3. Biometric systems like Anti-Dozing Device for Drivers (Client: NHMP, Pakistan), Smart Self-Adaptive Portable Ventilator/CPR Machine, IoT-based Hospital Bed Occupancy Management System, COVID-19 SOPs Monitoring and Management System using AI-managed Embedded Computer Vision

Collaborations:

National Highway and Motorway Police, Saleem Steel Industries, Jinnah Hospital, Saadan Hospital

Group Team Members:

1. Dr. Omer Saleem
2. Mr. Hamza Yousuf
3. Mr. Ahmad Hamza
4. Mr. Asim Huss

Dr. Omer Saleem

Associate Professor EE is Head of ECRG

5. Case Research Center (CRC)

Introduction

The Case Research Center (CRC) has been instituted at the FAST School of Management (FSM), Lahore to encourage both faculty and students to engage in solid case research. There is a dearth of business cases related to Pakistan and that is the reason our business schools have to rely on foreign cases for teaching. The facilities that would be provided at the center will be instrumental in bridging the gap between foreign and local cases. The center is a forum for interaction between students, faculty and the industry, and will provide turnkey consultancy solutions to the local industry. The mission of CRC is to motivate researchers to publish business cases and to subsequently increase both the quality and the quantity of case research and teaching in Pakistan.

Core Research Areas/Research Foster

Case Research Center (CRC) plays a pivotal role within the FAST School of Management, benefiting both the institution and its students in the following several ways:

1. CRC helps in experiential learning approach fosters a deeper understanding of business challenges, preparing students for their future careers in management.
2. This helps in offering students an opportunity to apply theoretical knowledge to practical situations.
3. CRC provides students with a platform to apply management theories and concepts in solving complex, real-world problems.
4. CRC contributes significantly to the academic and professional aspects of management education.
5. One of the core areas of CRC is to develop real-world case studies. Faculty and researchers collaborate to identify, document, and analyze relevant business problems and scenarios. This active learning approach enhances students' critical thinking, decision-making, and problem-solving skills.
6. By using case studies, students are exposed to a wide range of industries, sectors, and managerial dilemmas.

Current Projects

1. Faculty training sessions on case solving, case teaching and research.
2. Development of case studies.
3. Research Seminars and Industrial Visits
4. Research Publications
5. Industrial Partner/Collaborators

Dr. Hamid Hassan

Professor FSM is Head of CRC

6. Centre for Research on Management and Governance (CRMG)

Introduction

The Centre for Research in Management and Governance (CRMG) has been established under the auspices of the FAST School of Management, Lahore Campus (FSM) with the primary mission of promoting and advancing research in the fields of management and governance within the context of Pakistan.

CRMG serves as a focal point for the pursuit of scholarly inquiry and intellectual exploration, primarily driven by PhD faculty and students who are currently enrolled at the institution. These aspiring scholars are ardently engaged in conducting research that delves into various facets of management and governance, focusing on themes that are pertinent to the socio-economic landscape of Pakistan.

The CRMG has witnessed a commendable track record of producing capable and accomplished scholars, with several students having successfully completed their doctoral studies and earned their coveted PhD degrees. Currently, the center is nurturing a cohort of about 20 doctoral candidates, each at various stages of their academic journey

towards the completion of their PhD programs. The research endeavors undertaken at CRMG, both in theoretical and empirical domains, are anticipated to yield valuable findings. These findings are poised to serve as a compass, offering guidance and informed strategies to confront and address the multifaceted challenges encountered by public and private sector organizations operating within the distinctive context of Pakistan. The CRMG is thus firmly committed to advancing knowledge, disseminating insights, and contributing to the enhanced management and governance practices that will ultimately drive progress and prosperity in the nation.

Core Research Areas/Research Foster

1. Corporate Governance and Public Policy
2. Organizational Management
3. Sustainability and Sustainable Development
4. Innovation and Technology Management
5. Strategic Management
6. Entrepreneurship and Small Business Management
7. Ethical Leadership
8. Banking and Finance
9. Marketing and CSR

Dr. Hamid Hassan

Professor FSM is Head of CRMG

7. Executive Development Centre (EDC)

Vision

EDC-FSM a neural Hub for industry business solutions

Introduction

Embracing the ethos of innovation and excellence, the Executive Development Centre housed under FAST School of Management at NUCES, FAST was formed as a beacon of transformative leadership-a pioneering centre at the intersection of technological prowess and leadership excellence. The FAST Executive Development Centre fortifies the commitment of cultivating visionary leaders who embody the core values of patriotism, openness, passion, energy, integrity and sustainability. Championing pioneering initi-atives, our institution fosters an environment where potential meets opportunity, transcending boundaries to unlock novel solutions in an ever-evolving landscape. With programs spanning from Management, Business Analytics, Financial Technology to Accounting, and Finance, we empower executives to navigate management, risks, harness sustainable and ethical practices, and embrace integrated thinking to catalyze meaningful change and drive organizational success in the digital age.

Core Training Areas

Designed to cater to the dynamic needs of today's industry leaders and professionals, this centre embodies NUCES, FAST's commitment to nurturing talent and fostering continuous growth in the ever-evolving landscape of technology and business in several ways:

1. **Developing Management Expertise:** The centre will provide basic and advanced trainings of management, human resource, finance, accounting, ethics, econometrics, operations, and supply chain for all levels of management.
2. **Interdisciplinary Innovation:** The Centre integrates insights from various fields to pioneer interdisciplinary solutions that address industry challenges comprehensively.
3. **Sustainable Solutions Integration:** The Centre is committed to embedding sustainability principles into every facet of its industry contributions. Its focus on sustainable solutions not only mitigates environmental impact but also fosters long-term resilience and profitability within industries, aligning with global sustainability goals and enhancing brand reputation.
4. **Continuous Industry Learning:** Through its emphasis on continuous learning, the Centre empowers industry professionals to stay abreast of rapid technological advancements and market shifts.
5. **Ethical Leadership Cultivation:** By instilling ethical principles and values in executives, the Centre contributes to the cultivation of a culture of integrity, transparency, and accountability within industries.

Trainings and Workshops Conducted

1. Mastering SAP: Accounting for professionals
2. Python and R for Business Analytics
3. Social Network Analysis and why it is important to do network analysis
4. Large Language Models and Your Personal Data: Implications for Research and Business

Dr. Hamid Hassan

Professor FSM is Head of EDC

8. Environmental Engineering Lab (EEL)

Introduction

Environmental Engineering Laboratory at FAST-NUCES was established in 2015 with a vision to pioneer innovative research in the field of environmental engineering. Our laboratory serves as a hub for cutting-edge research and development, focusing on addressing critical environmental challenges facing our world today. Our overarching vision is to contribute to the sustainable

management of water resources, the preservation of environmental quality, and the advancement of technologies that protect and enhance the natural environment.

Committed to excellence in both research and education, our laboratory fosters a collaborative and multidisciplinary environment. We are dedicated to nurturing the next generation of environmental engineers, empowering them with knowledge, skills, and a deep sense of responsibility for the environment. Through our research endeavors, we aim to develop sustainable solutions that not only mitigate environmental issues but also promote the well-being of communities.

Core Research Areas / Research Foster

1. **Environmental Sustainability**

Sustainability is at the heart of our research efforts. We explore innovative approaches to balance environmental protection, social well-being, and economic development. Our goal is to develop sustainable solutions that harmonize human activities with nature.

2. **Wastewater Treatment**

The treatment and management of wastewater are essential for preserving environmental quality. Our laboratory investigates advanced wastewater treatment technologies and the efficient removal of contaminants from water.

3. **Water Quality**

Ensuring the quality of water resources is paramount. We conduct in-depth studies on water quality parameters, monitoring and assessing the impact of various factors on water quality.

Current Projects

1. A Sustainable Approach to Wastewater Reuse in Construction
2. Impact of Degraded Water on Immune Response
3. Hematopoietic Cell Lines Variations

Dr. Syed Ali Rizwan

Professor Cvl. Engg. Is Head of EEL

9. Advanced Materials Lab (AML)

Introduction

The Advanced Civil Engineering Materials Lab stands as a premier facility for in-depth analysis of construction materials. Within our well-equipped laboratory, we provide a comprehensive suite of tests and experiments tailored to evaluate the properties and characteristics of various materials crucial for civil engineering projects. These tests encompass the Vicat Apparatus for measuring cement consistency and setting time, the Hagerman Mini Slump Cone for assessing concrete workability, mixing analysis for ensuring homogeneous mixtures, and Shrinkage tests to mitigate deformation risks. We also offer Calorimeter tests to monitor heat generation during cement hydration, Ultrasonic Pulse Velocity tests for non-destructive assessments, Electrical Resistivity analysis for corrosion resistance, and Modified Chapelle's Tests to determine sulfate resistance. Our team of skilled engineers and technicians is readily available to assist in conducting these tests and interpreting their results, making certain that construction materials meet the highest quality standards.

Core Research Areas / Research Foster

1. Enhancing construction material durability
2. Optimizing concrete mix design
3. Developing innovative testing methodologies
4. Improving early-age concrete properties
5. Ensuring long-term infrastructure performance
6. Early hydration and curing processes.
7. Non-destructive testing for material quality
8. Electrical resistivity for durability and corrosion assessment
9. Sulfate resistance in cementitious materials
10. Supporting sustainable construction practices
11. Fostering material innovation for civil engineering projects.

Current Project

1. Development of sustainable construction materials using a multi-scale experimental and analytical approach." NRPU Project.

Dr. Syed Ali Rizwan

Professor Cvl. Engg. Is Head of AML

9. MathX Lab

Introduction

At MathX, we embark on a journey of relentless curiosity, exploration, and innovation at the intersection of mathematics and technology. Our vision is to push the boundaries of mathematical knowledge and its practical applications, driving advancements that have a profound impact on industries, society, and the way we perceive the world.

Mathematics is the universal language of problem-solving, and at MathX, we believe in connecting its power to unlock solutions to complex problems of different fields. Our interdisciplinary team of brilliant minds, including mathematicians, computer scientists and engineers, collaborates tirelessly to untie the mysteries of mathematics and apply its principles to diverse domains. We are committed to promote a culture of intellectual rigor and creativity, where diverse perspectives converge to generate groundbreaking ideas. Whether it's in the domains

of numerical computing, algorithm designing, quantum computing, or mathematical modeling in fractional and fuzzy environments. We are driven by a passion for discovery and a desire to make mathematics accessible and applicable to all. Our mission is to advance mathematical knowledge and catalyze positive change. We aim to be the best in mathematical research, pushing the boundaries of what's possible, and ultimately, making the world a better place through the magic of mathematics.

Fields of Research

MathX conducts research in the field of applied and computational mathematics. Their research endeavors span a range of core areas, with a particular emphasis on modeling and simulations in fluid mechanics, fuzzy-fractional modeling, and development of numerical algorithms. MathX is not limited to theoretical research; we also have a strong commitment to applying mathematical innovations to real-world problems. Our current projects are based on fuzzy-fractional modeling in fluid dynamics and mathematical physics, where we aim to better understand and predict the behavior of physical systems. Additionally, we are exploring biological modeling of epidemic diseases, which is of utmost importance in the context of public health crises.

International Collaborators

1. Ali Akgul, Siirt University, Turkey
2. Mustafa Inc, Firat University, Turkey
3. Choonkil Park, Hanyang University, Korea
4. Jan Awrejcewicz, Lodz University, Poland
5. Hijaz Ahmad, International Telematic University, Italy
6. Saraswati Acharya, Kathmandu University Nepal

Research Group Members

1. Dr. Mubashir Qayyum
2. Dr. Omar Khan
3. Dr. Syed Tauseef Saeed
4. Ms. Efaza Ahmad
5. Ms. Sidra Afzal

Dr. Mubashir Qayyum

Professor Math is Head of MathX Lab