DIRECTOR

Dr Omar Usman Khan
Professor
PhD Approved Supervisor
PhD (CCE), Politecnico di Torino, Italy (2013)
MS (CSE), GIKI, Topi (2008)
MS (DS), Brunel University, UK (2005)
BS (CS and SE) Greenwich University, UK (2002)

The Peshawar campus is located in the vicinity of Hayatabad; a modern residential suburb of Peshawar. Spread over an area of 4 acres, the campus houses an academic and administrative block; constructed in the university's signature red brick architectural style, and a hostel for boys. It offers a conducive environment with green lawns, flora, plantations, and water fountains. The campus is conveniently close to multiple hospitals, markets, residential areas, sports complexes, government offices, and food streets. With multiple routes, transportation via the city's Metro BRT is quite convenient and economical, and can be accessed through the university's own metro BRT bus stop.

To add value to the student learning process and academic excellence, the university has state of the art infrastructure and academic resources, along with highly qualified and committed faculty. The faculty are up-to-date with both scientific and technological progresses, industry requirements, and global trends in their respective fields. With one of the best student to faculty ratios, students have more exposure to learning and working closely with them. The campus has state of the art computing, engineering, and computer assisted language/

communications labs. High speed network access to all devices is made available through campus-wide wireless access points. There is a provision of GPU and big-data enabled high performance computing facilities for its research students. There are separate labs for students of all levels who require them to work on their projects and research thesis. The campus also offers co-working spaces and pre-incubation environment to selected students. The campus library has a collection of over 15,000 unique books, and hundreds of printed research journals. Subscription to research journals of IEEE, Springer, Science Direct, and ACM, are made and these can be accessed from student homes through VPN. All classrooms, labs, and halls are fully air-conditioned. For class-room learning, all rooms are equipped with audio/video facilities.

The campus highly encourages its students to get affiliated with various societies of the campus. Students are offered membership of local and regional chapters of the ACM, IEEE, and Microsoft. Technical societies deal with activities related to programming and engineering competitions, whereas social societies include activities associated to travel and hiking, indoor and outdoor sports, E-gaming, religious

events, debating and fine arts, music, and other philanthropic activities.

Among the programs offered by the campus, the Bachelor of Science (Electrical Engineering) has the distinction of being one of the first in Khyber Pakhtunkhwa to have received Outcome Based Level II accreditation status by the Pakistan Engineering Council (PEC). Likewise, the various BS computing programs are regularly accredited with the National Computing Education and Accreditation Council (NCEAC). With the input from these accreditation councils, and Industrial Advisory Boards, the curriculum and study plans are highly customized according to the national industrial needs. As such, graduates of the campus are well received by the industry and hold prominent positions in national and multi-national corporations.

Programs offered at Peshawar Campus:

Bachelor of Science (Artificial Intelligence)

Bachelor of Science (Computer Science)

Bachelor of Science (Computer Engineering)

Bachelor of Science (Electrical Engineering)

Bachelor of Science (Software Engineering)

Master of Science (Computer Science)

Master of Science (Data Science)

Doctor of Philosophy (Computer Science)

1. National University Systems and Simulations (NUSYS) Group

The National University Systems and Simulation (NUSYS) group, established in 2016, covers research activities in a diverse set of disciplines ranging from wireless and sensor networks, signal processing, smart grids, speech recognition, scientific computing, computational electromagnetics, and quantum computing. The group has worked on various funded projects of the Higher Education Commission, NATO Science for Peace, and NRTC, along with small grants from the US consulate, and Ignite ICT R&D. The group has former collaborations with Princeton; USA, Waseda University; Japan, Politecnico di Torino; Italy, and University of California; USA.

Projects (completed)

1. Automatic Speech Recognition for Pashto (Agency: NRTC, PKR 2 Million)
2. Design and Analysis of a 400 km Quantum Key Distribution Link (Agency: NATO-SPS, PKR 8 Million)
3. Low-Cost Seismic Monitoring Network (Agency: HEC, PKR 2.8 Million)

For more information visit the website link:
http://pwr.nu.edu.pk/nusys

Dr. Usman Abbasi

Assistant Professor EE is Head of NUSYS

2. Center for Computational Linguistics (COCL)

The group, established in 2018, focusses on developing algorithms for better processing and analyzing natural languages, with a special focus on regional languages like Urdu and Pashto. The work is multi-disciplinary in nature, and builds upon the fields of social linguistics, psycholinguistics, pragmatics, and machine learning. The group has collaborations, research, and data sharing arrangements with the Pashto Academy (University of Peshawar) and Al-Khawarizmi Institute of Computer Science (UET Lahore).

Group Key Activities

1. Arabic: Quran Tajweed based Tilawat Checker
2. Pashto: Automatic Thesaurus Generation, Grammar checker, Spelling checker, Lexicon development
3. Urdu: Poetry Classification, Font Style Transfer
4. Urmuri: Lexicon Development (Agency; Pashto Academy; 0.5 Million)

For more information visit the website link:
http://pwr.nu.edu.pk/CoCL

Dr. Omar Khan

Professor CS is Head of COCL

3. Computational Informatics Research Lab (CIRL)

The Computational Informatics Research Lab (CIRL) is a multidisciplinary group of researchers with expertise in computational imaging, bioinformatics, and machine learning. The group was established in 2016 with the goal of developing new computational methods for the analysis and interpretation of biomedical data. CIRL's research interests include medical image processing, bioinformatics, machine learning, data mining and visualization, and clinical decision support systems. The group has developed a number of innovative computational methods for the analysis of biomedical data. These methods have been used to improve the diagnosis and treatment of a variety of diseases, including cancer, Alzheimer's disease, and heart disease. CIRL has strong collaborations with other research groups at the National University of Computer and Emerging Sciences (NUCES), as well as with international research groups at Politecnico di Torino, Italy, and local hospitals Peshawar. The group is led by Dr. Hafeez Ur Rehman, who is an internationally recognized expert in computational imaging and bioinformatics. The research activities are supported by a number of grants from the government of Pakistan, as well as from international funding agencies.

Projects

1. Incorporating Evolving Biological Information in Protein Function Prediction (Grant Funding Body: HEC)
2. Detection of Lung Carcinoma using Genomics (Funding Body: Ignite)
3. Pathological Myopia Detection using Fundus Images (Funding Body: Ignite)
4. Iris based Non-invasive Glucose Monitoring System (Funding Body: US Consulate)
5. Detection and Localization of Covid-19 from Chest Radiographs (Funding Body: FAST)
6. Genetic Subtype of MGMT Prediction using MRI (Europe, Middle East and Africa Winners in Health Category; Microsoft Imagine Cup 2023)
7. Genetic Subtype of MGMT Prediction using MRI (Pakistan National Winners; Microsoft Imagine Cup 2023)

For more information visit the website link:
http://pwr.nu.edu.pk/CiRL

Dr. Hafeez ur Rehman

Associate Professor CS is Head of CIRL

4. Decision Support Systems (DSS) Group

The research goals of this group are directed towards understanding and building of intelligent models for

assisting and supporting decision making in various application areas such as image processing, security, and bioinformatics. The group is actively engaged in utilizing machine learning methods such as rough sets, granular computing, game theory, and three-way decisions, in inducing rules for complex decision making. A main focus is three-way decisions, especially when multiple criterion and multiple agents are involved. The group headed by Dr. Nouman Azam has produced 3 PhD's and a number of MS students. The group has won HEC Best research paper award 2016. The current student strength of the group stands at more than 20. The group has received multiple grants from the US Consulate in Peshawar, the Ignite ICT R&D and has research partners in Umm Al-Qura University; Saudi Arabia, University of Regina; Canada, IMSciences; Peshawar, and Qatar University; Qatar. Currently funded projects include:

1. Three-way Approach for the Prediction of Protein Structure from Images, Funding Agency: FAST; 0.7 Million.
2. Incorporating Evolving Biological Information in Protein Functions Prediction, Funding Agency: HEC; 0.15 Million (2016-2017)
3. Attribute Division using Three-way Decisions for Differential Privacy, Funding Agency: FRSG-FAST; 0.5 Million (2021)
4. Three-way Clustering Approaches for open world Classification, Funding Agency: FRSG-FAST; 0.8 Million (2022)

Dr Nouman Azam

Associate Professor CS is Head of DSS Group

5. Computing Laboratory NU (COLABNU)

The NU computing laboratory, established in 2017 at the campus, is a pre-incubation lab cum office with the aim of elevating the quality of undergraduate and graduate students. Students are enrolled at an early stage of their degree, and depending on their performance and set targets, are allowed to promote across tiers as they mature into later stages of their degree. A multi-tier mentoring scheme is followed in the lab, involving both senior students, and faculty. The work environment, and the synergy between colab members, enables students to take charge and work with topics of contemporary importance that would otherwise not be covered in their courses.

Mr Fazl-e-Basit

Assistant Professor CS is Head of COLABNU

6. NU Center for Automation and System Engineering (NUCASE)

The Center for Automation and System Engineering (CASE); established in 2023, is a research lab dedicated to pushing the boundaries of innovation in the field of automation and intelligent systems engineering. It brings together a multidisciplinary team of experts dedicated to solving complex challenges and driving transformative change. With a focus on harnessing the power of AI/ML, robotics, IoT, and advanced automation techniques, CASE aspire to engineer intelligent systems that not only enhance efficiency and productivity but also contribute to the betterment of society. The group has collaborations with Federal University of Santa Catarina, Brazil, and Khyber Medical University, Peshawar. Through these collaborations, CASE is committed to translate findings into practical solutions, shaping the future of technology, and empowering society.

Dr. Ali Sayyed

Assistant Professor CS is Head of NUCASE

7. Data Centric AI Lab

The group, established 2024, is mainly concerned with the applications of AI/ML/DL. To this end, members of the group work on solution to the various day to day problems-based data of various modalities such as images, text an signals etc. The main application areas are: Digital Humanities, Transportation, Animal Biodiversity, Human activities recognition for health care based on data from wearable sensors, and Electrical Power forecasting. The lab is headed by Dr. Hafeez Anwar and has established collaborations with King Fahad University of Petroleum and Minerals; Kingdom of Saudi Arabia, CSIRO; Australia, and University of Western Australia; Australia. Students of the lab have been successfully recipients of several small grants from IGNITE ICT R&D. Most recent publications of the group are published in prestigious journals like Sensors, Electronics, Pattern Recognition, and Entropy.

Dr Hafeez Anwar

Associate Professor CS is Head of AI Lab

8. Machine Learning and InfoSec Lab

The Machine Learning and InfoSec Lab, established 2024, focuses on research in privacy, cyber security, and malware detection. Additionally, we investigate machine learning applications in diverse fields such as bioinformatics and computer vision, and work actively on develop cutting-edge machine learning algorithms for enhanced malware detection, privacy preservation, and cybersecurity in digital environments. Key publications of the group are published in Computers and Electrical Engineering, and Transactions on Emerging Telecommunication Technologies.

Dr Waqas Ali

Assistant Professor CS is Head of InfoSec Lab

9. Robotics and Radar Communication Systems (RRCS)

The research goals of this group are directed towards developing AI based signal processing techniques for Robotics and Radar Systems. The lab aims to provide innovative and cutting edge solutions for MIMO based Radar Systems using advance signal processing and 3-D EM CAD tools, for applications such as path planning, Robotic rescue in hazardous environment, multi Robot exploration etc. The research also focusses on design and development of integrated small and smart antennas for AI based IoT platforms. The group, established in 2023 is headed by Dr. Suleman Mir, and has 4 student members and an RA. Current collaborations of the group are with Sicoya Gmbh, Berlin; Germany, Air University, NUST, and University of Porto; Portugal. The group has designed and fabricated fractal antennas, where the design was conceived at FAST, fabrication in China, and testing in NUST, Islamabad.

Projects

1. Target identification using MIMO Radars for Robotic rescue in hazardous environment, Funding Body: FRSG-NUCES; 1.2 Million, (2024-2025)

Dr. Suleman Mir

Assistant Professor CE is Head of RRCS.

10. FAST Math Tech Group (FMTG)

FMTG aims to utilize concepts from general relativity and computational mathematics to address a diverse field of challenges in computer science, engineering, and science. Our research endeavours focus on bridging theoretical frameworks with practical applications, fostering collaborations across disciplines to tackle real-world problems efficiently and effectively. The group aims to deepen understanding of gravitational phenomena, particularly new black holes in different frameworks, through theoretical exploration and observational analysis. As such, ultimately it seeks to uncover fundamental insights into the nature of space-time and the universe. The group, established 2023 is headed by Dr. Askar Ali, and holds collaborations with Quaid-e Azam University; Islamabad, FAST-NUCES; Lahore, GIKI, and Eastern Mediterranean University, Turkiye.

Dr Askar Ali

Assistant Professor Math is Head of FMTG

11. Quantum Communication and Computing (QCC) Group

The Quantum Communication and Computing Lab (QCCL) is dedicated to pioneering research in the fields of quantum communication, quantum computing, and quantum information processing. Our research goals are focused on advancing the understanding and development of quantum technologies for secure communication, efficient computation, and robust infor-mation processing across diverse application domains. The group strives to investigate and develop novel techniques for secure communication, cryptography, and network security using quantum communication protocols, and also works on the theoretical foundations and practical implementations of quantum algorithms, quantum circuits, quantum information processing techniques, and fault tolerance/reliability. Principal group activities were carried out under NUSYS. However, as students and work on quantum technologies exclusively has grown considerably, QCCL was formed in 2024 by Dr. Muhammad Maqsood Khan.

Dr. Maqsood Muhammad Khan

Assistant Professor CE is Head of QCC.