Hassan Ahmed

Instructor, Department of Computer Science, FAST - NUCES, CFD Campus, Pakistan

hassan.ahmed@nu.edu.pk (Work) | +92-41-111-128-128 Ext: 272
mianhassaan1166@gmail.com (Primary) | +92-302-019-5050 (Mobile)

 hassanahmed1166 | hassanahmed1166.github.io | G Google Scholar | ResearchGate

Office # G-19, Department of Computer Science, FAST - NUCES, CFD Campus, Pakistan

ABOUT ME

I am a computer science researcher passionate about learning and experimenting with emerging technologies. My work spans artificial intelligence, cybersecurity, and data-driven systems. I focus on developing secure, transparent, and reliable AI models that can be trusted in high-impact domains such as smart cities, healthcare, autonomous systems, and digital security. I aim to bridge theory and application by integrating advanced machine learning methods with practical solutions for real-world challenges.

Research Interests: Artificial Intelligence, Deep Learning, Explainable AI, Cybersecurity, Network Security, Natural Language Processing, Large Language Models

EDUCATION

•Master of Science in Computer Science *2022 - 2024*

University of Wah, Wah Cantt, Pakistan CGPA: 3.46/4.0

- **Thesis:** DeepCAN: A Robust Deep Learning Framework for CAN Intrusion Detection in Autonomous Vehicles
- **Supervisor:** Professor Dr. Wazir Zada Khan
- **Coursework:** Advanced Network Security, Information Security, Advanced Image Processing, Advanced Machine Learning, Research Methodologies, Advanced Operating Systems

•Bachelor of Science in Software Engineering *2018 - 2022*

COMSATS University Islamabad, Wah Campus, Pakistan CGPA: 3.01/4.0

- **Final Year Project:** Development of a First-Person Shooter Game using the Unity Engine
- **Supervisor:** Ms. Mehwish Mukhtar
- **Selected Coursework:** Artificial Intelligence, Linear algebra, Data Structures and Algorithms, Machine Learning, Introduction to Data Science, Human-Computer Interaction, Statistics and Probability Theory

EXPERIENCE

•Instructor *Aug 2024 - Present*

Faculty Profile FAST - National University of Computer and Emerging Sciences, CFD Campus
Responsibilities

- Instructed and mentored undergraduate students in lab sessions
- Courses taught: Programming Fundamentals, Operating Systems, Computer Networks, IT in Business
- Member of departmental course folder review panel and committee for NCEAC
- Member of Organizing Committee for ICIT 2026

•Graduate Assistant *Nov 2022 - June 2024*

Responsibilities University of Wah, Wah Cantt

- Conducted Labs for undergrad students at the Department of Computer Science
- Courses: Database Systems, Database Applications, Applications of ICT
- Assisted in Outcome-Based Education (OBE) curriculum development and materials preparation.
- Contributed to departmental administrative tasks and projects

•Intern *July 2022 - Oct 2022*

Learnings Pakistan Ordnance Factories, Wah Cantt

- Gained experience with database management
- Analyzed network topologies and assisted in the implementation of network protocols within the organization
- Delivered presentations on ongoing projects, effectively communicating technical concepts

PUBLICATIONS
C=Conference, J=Journal, S=In Submission, IP=In-progress

[C.1] Hassan Jari, **Hassan Ahmed,** Hareem Kibriya, Wazir Zada Khan, Ali Tahir. **An Ensemble Deep Learning Framework for Autonomous Vehicle Attack Detection**. In *Proceedings of the 2025 International Conference on Emerging Technologies in Electronics, Computing, and Communication (ICETECC)*, Jamshoro, Pakistan, 23–25 April 2025, IEEE, DOI: 10.1109/ICETECC65365.2025.11070228.

[S.1] **Hassan Ahmed**, Abdullah Khan, Azhar Mahmood, Jibran Mir, Sohaib Ahmed (2025). **CAN You Need More Attention? CANformer-XL: Long-Context Intrusion Detection in Controller Area Networks Using Transformer-XL** submitted to Expert Systems With Applications by Elsevier.

[S.2] Abdullah Khan, Arooj Fatima, Ridda Jameel, **Hassan Ahmed**, Aini Saba (2025). **Enhancing Social Media Bot Detection with Cross-Feature Gating and Residual Learning** submitted to ICCK Transactions on Emerging Topics in Artificial Intelligence.

[IP.1] **Hassan Ahmed**, Abdullah Khan, Ridda Jamil (2025) **Intrusion Detection System for UAVs.**

[IP.2] Abdullah Khan, **Hassan Ahmed** (2025). **Jailbreak Attacks on LLMs: Empirical Study and Defense Mechanism**.

[IP.3] **Hassan Ahmed** & Imane Guellil (2025) **Systematic Literature Review on Multimodal AI Methods for Alzheimer's Disease Detection**.

CONFERENCES

R=Reviewer, P=Presenter, A=Attendee

[R.1] **International Conference on IT and Industrial Technologies** at FAST-National University of Computer and Emerging Sciences, CFD Campus, Pakistan. Date: 10 - 12 Dec, 2024.

[R.2] **International Conference on Artificial Intelligence and Green Computing** at Campus Mghilla, Beni Mellal, Morocco. Date: 14 - 16 May, 2025.

[P.1] **4th International Conference on Smart Plant Protection** at MNS-University of Agriculture, Multan, Pakistan. Date: 30 - 31 Oct, 2024.

[P.2] **2nd International Conference on Emerging Technologies in Electronics, Computing and Communication (ICETECC 2025)** at Mehran University of Engineering & Technology, Jamshoro, Sindh, Pakistan. Date: 23 - 25 April, 2025.

[A.1] **8th Multi-Disciplinary Student Research International Conference** at University of Wah, Wah Cantt, Pakistan. Date: 06 - 07 Dec, 2023.

[A.2] **Leaders' Conference on AI in Education and Institutional Leadership** at FAST-National University of Computer and Emerging Sciences, CFD Campus, Pakistan. Date: 25 - 26 June, 2025.

TECHNICAL SKILLS

Languages: Python, C++, SQL
Libraries and Frameworks: *Data Science:* NumPy, Pandas; *Machine Learning:* Scikit-learn, XGBoost; *Deep Learning:* TensorFlow, Keras, PyTorch; *NLP & LLMs:* Hugging Face Transformers, LangChain, NLTK, SpaCy; *Explainability:* LIME, SHAP; *Computer Vision & Medical Imaging*: OpenCV, MONAI, SimpleITK
ML Techniques: Transfer Learning, Fine-tuning of Pretrained Models, Prompt Engineering, Model Deployment, Explainable AI
Research: LaTeX, EndNote, Edraw Max, Mendeley, Covidence
Tools: Jupyter Notebook, Kaggle, Google Colab, Anaconda, GitHub, MS Office, MS Access, MS Visio, Cisco Packet Tracer, Wireshark
Operating Systems: Windows, Linux

PROJECTS

•DeepCAN: Intrusion Detection System for Controller Area Network
Tools, Programming Languages & Libraries: Kaggle, Python, Keras, TensorFlow, Pandas, NumPy, Scikit-learn, Matplotlib
– Developed DeepCAN, a deep learning-based Intrusion Detection System (IDS) for the Controller Area Network (CAN), to enhance the security of In-Vehicle Networks (IVNs) in Autonomous Vehicles (AVs)
– Implemented deep learning techniques for intrusion detection, achieving a classification accuracy of 94.52% and outperforming existing methods in terms of accuracy and F1-score.
– Created an advanced IDS framework that detects and classifies impersonation, fuzzy, and denial-of-service (DoS) attacks, ensuring improved security and reliability for AVs.
– Applied Explainable Artificial Intelligence (XAI) methods, such as LIME, to analyze detection results and provide interpretability in IDS decision-making.

•AgriGuard
Tools, Programming Languages & Libraries: Kaggle, Python, NumPy, Pandas, TensorFlow, Scikit-learn, Matplotlib, OpenCV, Seaborn
– Developed a pest image classification system for agricultural pest detection, enabling early pest identification and intervention to prevent crop losses.
– Implemented Deep CNN for pest classification, achieving an accuracy of 90.00%, thus improving detection efficiency and reducing the need for chemical pesticides.
– Created a deep learning-based classification pipeline with data augmentation and transfer learning, ensuring improved model generalization across diverse pest images.

– Applied confusion matrix and classification reports to analyze model performance, identifying precision, recall, and F1-score for different pest categories to optimize the classification process.

- **Urdu to Roman Urdu Transliteration System**
  Tools, Programming Languages & Libraries: *Kaggle, Python, PyTorch, NumPy, Pandas, NLTK, JiWER, Matplotlib*
  – Developed a Seq2Seq-based transliteration system to convert Urdu text into Roman Urdu for improved accessibility and linguistic processing.
  – Implemented a BiLSTM encoder and multi-layer LSTM decoder architecture to model character-level dependencies, achieving high-quality transliteration accuracy.
  – Trained the model on a custom parallel Urdu–Roman Urdu dataset with tokenization, padding, and teacher forcing for stable convergence.
  – Applied BLEU score evaluation and sentence-level inference to measure translation fluency and accuracy, achieving a BLEU score of 0.6943, perplexity of 1.1687, and character error rate of 0.0997, demonstrating strong performance for real-time transliteration tasks.

- **Breast Cancer Prediction using Machine Learning**
  Tools, Programming Languages & Libraries: *Python, Pandas, NumPy, Seaborn, Matplotlib, Scikit-Learn*
  – Developed a breast cancer prediction model using ML algorithms and achieved an accuracy of approximately 94.00 to 98.00%.
  – Implemented data preprocessing and feature selection techniques to process thousands of patient records for improved model performance.
  – Created correlation heatmaps and distribution plots to analyze key diagnostic features to enhance interpretability for clinicians.
  – Applied a classification pipeline for easy integration with hospital decision-support systems, aiding in early detection of breast cancer.

COURSES AND TRAININGS

–**Industrial Automation and Programmable Logic Controllers (PLCs)**   *2025*
  FAST - National University of Computer and Emerging Sciences, CFD Campus
–**Problem-Based Learning in OBE**   *2024*
  FAST - National University of Computer and Emerging Sciences, CFD Campus
–**Two-Day Teacher Training Workshop**   *2024*
  FAST - National University of Computer and Emerging Sciences, CFD Campus
–**Machine Learning, AI & Data Science**   *2024*
  Government of Punjab, Pakistan
–**Introduction to Generative AI**   *2024*
  Google Cloud
–**Introduction to Cybersecurity**   *2022*
  CISCO Networking Academy
–**Virtual Assistant**   *2022*
  DigiSkills.pk
–**Search Engine Optimization**   *2022*
  DigiSkills.pk
–**Data Analytics and Business Intelligence**   *2022*
  DigiSkills.pk
–**E-Commerce Management**   *2022*
  DigiSkills.pk

VOLUNTEERING & EXTRACURRICULAR ACTIVITIES

–**Blood Donation Volunteer**   *Sep 2019 - June 2022*
  Activities   Comsats University Islamabad, Wah Campus
  * Organized and managed multiple blood donation camps in collaboration with the Pakistan Red Crescent Society
  * Successfully motivated the students to take part, which led to the collection of more than 100 pints of blood per camp
  * Provided support and assistance to donors throughout the donation process, ensuring a positive experience for all participants

–**Media Head**   *Oct 2023 - May 2024*
  Activities   Computing Society, UW
  * Served as the Media Head, leading the documentation and coverage of various events and activities
  * Managed a team of photographers and ensured comprehensive coverage of all events, including but not limited to academic seminars, cultural festivals, and community service initiatives
  * Played a key role in promoting the visibility and positive image of the institution through compelling visual storytelling

–**Photographer**   *Oct 2022 - May 2024*
  Activities   Media & Mass Society, UW
  * Ensured comprehensive coverage of all events, including but not limited to academic seminars, cultural festivals, and community service initiatives

Awards & Achievements

—**Outstanding Contribution Award from PM of Pakistan** All Pakistan Minorities Heritage Photo Contest — *18th April, 2023*
—**02 times Winner of Naat Competition** Inter-University Competition by Literary Society, UW — *Oct 22 - May 24*
—**Winner of Naat Competition** National competition arranged by YPDC, UOC — *31st March, 2023*
—**Second Position in Naat Competition** National competition arranged by Pakistan National Arts Council — *25th Oct, 2023*
—**03 times Winner of Naat Competition** Inter-University Competition at CUI, Wah Campus — *Sep 18 - Dec 19*
—**02 times Winner of Kalam e Iqbal Competition** Inter-University Competition at CUI, Wah Campus — *Sep 18 - Dec 19*
—**Winner of Naat Competition** National competition arranged by FGEI (C/G) — *28th Oct, 2013*
—**Winner of Milli Naghma Competition** National competition arranged by FGEI (C/G) — *11 Nov, 2013*

Hobbies & Leisure Activities

Photography: Passionate about visual storytelling through photography. My genres include landscape, street, and portrait photography. View my work at: snappy_786

Travelling & Adventure: Enjoy exploring new places and cultures, meeting new people from diverse backgrounds, and learning from their traditions and ways of life. These experiences enhance my creativity and communication skills.

Singing: Award-winning performer in national and inter-university Naat, National Song, and Kalam-e-Iqbal competitions.

Referees

Professor Dr. Wazir Zada Khan
Professor, Faculty of Computer Sciences, University of Wah, Wah Cantt, Pakistan
Email: wazir.zada.khan@uow.edu.pk
Scholar Profiles: University of Wah - Personal Page

Dr. Ayesha Siddiqa
Assistant Professor, Department of Computer Science, University of Wah, Wah Cantt, Pakistan
Email: ayesha.siddiqa@uow.edu.pk
Scholar Profiles: University of Wah - Personal Page

Dr. Muhammad Fayyaz
Associate Professor & HoD, Department of Computer Science, FAST-NUCES, CFD Campus, Pakistan
Email: m.fayyaz@nu.edu.pk
Scholar Profiles: FAST-NUCES, CFD Campus - Personal Page