# Abdullah Khan

*Master's Student, Department of Computer Science, University of Wah, Pakistan*

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## Summary

Motivated and research-driven Master's degree holder in Computer Science, with 6 years of full-stack development experience and a strong foundation in AI, machine learning, and cybersecurity. Recently completed a Master's thesis focused on combating deepfake audio cloning using deep learning and transformers, while also exploring quantum computing for secure and robust AI systems. My research addresses critical challenges in AI security and intrusion detection in autonomous vehicles. Experienced in international collaboration, solution-oriented research, and development. Eager to pursue a PhD to drive cutting-edge advancements in AI security and quantum-enhanced technologies.

***Research Interests:*** Information Security, Deep Learning & AI, Quantum Computing, Medical Imaging

## Education

**•Master of Science in Computer Science** *2023 - 2025*
*University of Wah, Wah Cantt, Pakistan* CGPA: 3.74/4.0

- **Thesis:** Transformer and Rule-Based Zero-Shot Voice Cloning Detection
- **Superviser:** Professor Dr. Wazir Zada Khan
- **Coursework:** Advanced Machine Learning, Advanced Network Security, Advanced Analysis of Algorithms, Research Methodologies, Advanced Operating Systems, Web Mining, Quantum Computing, Image Processing

**•Bachelor of Science in Software Engineering** *2018 - 2022*
*COMSATS University Islamabad, Wah Campus, Pakistan* CGPA: 3.37/4.0

- **FYP:** Restaurant QR System
- **Superviser:** Mr. Waheed Ahmed Khan

## Publications

C=Conference, J=Journal, S=In Submission

**[C.1]** Abdullah Khan, Sherif Tawfik Amin, Hareem Kibriya, Wazir Zada Khan, Ayesha Siddiqa, Ali Tahir. **A Dynamic Approach for Detecting Attacks in Controller Area Networks**. 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/ICETECC65365.2025.11070255.

**[S.1]** Abdullah Khan, et al. (2025). **Efficient Quantum Neural Networks for Synthetic Voice Identification in IoT-Enabled Holographic Counterparts**. Manuscript submitted for publication in *IEEE Transactions on Consumer Electronics*.

## Conferences

R=Reviewer, P=Presenter, A=Attendee

**[P.1 ]** **2nd International Conference on Emerging Technologies in Electronics, Computing and Communication (ICETECC 2025)** at Mehran University of Engineering & Technology, Jamshoro, Sindh, Pakistan. Date: 23 April, 2025.

**[A.1 ]** **7th Pak-Turk International Conference on Emerging Technologies in the Field of Sciences and Engineering** at University of Wah, Wah Cantt, Pakistan. Date: 14 - 15 Oct, 2024.

**[A.2 ]** **8th Multi-Disciplinary Student Research International Conference** at University of Wah, Wah Cantt, Pakistan. Date: 06 - 07 Dec, 2023.

## Experience

**•Lead Developer** *June 2022 - Present*
*gamersandgeek* Gamers and Geek - Tech and Gaming Blog
*Responsibilities*
- Led the design and development of the blog's front-end and back-end architecture, ensuring performance, scalability, and security
- Managed content integration, SEO optimization, and analytics tracking to improve site visibility and user engagement

**•Full Stack Developer** *Jan 2018 - 2022*
*etechpk* Eteckpk - IT Solutions and Services
*Responsibilities*
- Developed and maintained client-facing service modules, including booking systems, CRM integrations, and automated inquiry handling
- Built scalable APIs and dashboards to support operations, analytics, and customer support workflows
- Collaborated with stakeholders to design user-centric features, ensuring seamless performance across devices and platforms

*For more development projects and professional details, visit my LinkedIn:* Abdullah-projects

## Technical Skills

**Languages**: PHP, Python, SQL, Solidity, JavaScript, React, Node.js, C++, Java
**Libraries**: NumPy, Pandas, TensorFlow, PyTorch, Scikit-learn, Keras, Matplotlib, Seaborn, Plotly, XGBoost, Qiskit, PennyLane, Cirq
**Developer Tools**: Github, Visual Studio, Google Colab, Anaconda
**Databases**: Relational Database (MySQL)
**Research**: LaTeX, Endnote, Edraw Max
**Tools**: Kaggle, Jupyter Notebook, Google Colab, Canva, MS Office, MS Access, MS Visio, CISCO Packet Tracer, Wireshark
**Operating Systems**: Windows, Linux

## Soft Skills

**Communication**: Strong written and verbal skills, public speaking, active listening, and concise articulation
**Collaboration**: Team coordination, relationship building, cross-functional cooperation, and empathy
**Analytical Thinking**: Creative problem-solving, logical reasoning, and adaptability in dynamic environments
**Leadership**: Strategic decision-making, task delegation, team motivation, and conflict resolution
**Time Management**: Effective prioritization, deadline management, goal orientation, and multitasking capabilities

## Projects

•**An Explainable DL-Heuristic Framework for Automotive Attack Detection in Controller Area Networks**
***Tools, Programming Languages & Libraries:*** *Python, TensorFlow, Keras, Pandas, NumPy, Scikit-learn, SHAP*
– Developed a lightweight intrusion detection framework combining Multi-Layer Perceptron and Gated Recurrent Unit models with domain-driven heuristic rules to detect sophisticated threats, including replay and flooding attacks, in Controller Area Networks.
– Integrated SHAP to provide interpretability for model predictions, enhancing transparency in automotive cybersecurity.
– Achieved 99.73% accuracy, with precision, recall, and F1-score above 99.7%, and reduced attack detection time to 54 microseconds per sample, enabling real-time deployment in resource-constrained vehicular environments.

•**Analyzing the Impact of Quantum Gates**
***Tools, Programming Languages & Libraries:*** *Qiskit, Python, NumPy, Matplotlib, Scikit-learn, Keras, PyTorch, PennyLane*
– Investigated the effect of various quantum gates on the classification accuracy of quantum neural networks for audio deepfake detection using the DEEP-VOICE dataset.
– Analyzed combinations of PhaseShift, SWAP, and other gates to identify optimal configurations for efficient detection.
– Performed comparative evaluations against classical counterparts, highlighting benefits in performance and resource efficiency.

•**A Survey on Voice Cloning Detection: State-of-the-art Challenges and Future Directions**
***Tools, Programming Languages & Libraries:*** *LaTeX, Python, Google Scholar, IEEE Xplore, Scopus*
– Conducted an extensive literature review on deep learning and signal processing methods used in voice cloning detection.
– Identified current limitations and gaps in consumer device adaptation, dataset diversity, and robustness to adversarial attacks.
– Proposed future research directions including explainability, privacy-preserving techniques, and quantum-enhanced detection.

•**Quantum Gate Optimization for Audio Deepfake Detection in Holographic IoT**
***Tools, Programming Languages & Libraries:*** *Qiskit, Python, Matplotlib, NumPy, PennyLane, Scikit-learn, Keras*
– Developed a hybrid quantum-classical system against deepfake audio threats through optimized gate-level circuit design, evaluating 28 quantum gate configurations on periodic audio data.
– Identified the CNOT+S gate combination as optimal by leveraging entanglement-driven correlation and phase-sensitive feature extraction for synthetic voice detection.
– Demonstrated enhanced detection performance with reduced computational load in resource-constrained holographic environments.

•**Quantum Neural-Convolutional Model for Brain Tumor Classification**
***Tools, Programming Languages & Libraries:*** *Qiskit, Keras, TensorFlow, Python, NumPy, Scikit-learn, OpenCV*
– Developed a hybrid quantum-classical convolutional neural network (QNN-CNN) for brain tumor classification from MRI scans.
– Integrated quantum layers to reduce model complexity while preserving classification performance.
– Achieved high accuracy on the BraTS dataset and demonstrated the potential of quantum computing in medical imaging.

•**A Dynamic Approach for Detecting Attacks in Controller Area Networks**
***Tools, Programming Languages & Libraries:*** *Python, TensorFlow, Keras, Pandas, NumPy, Scikit-learn*
– Designed a hybrid detection framework combining rule-based logic with deep learning models (GRU, RNN, and LSTM) to identify anomalies in Controller Area Networks (CAN) used in autonomous vehicles.
– Implemented time-series-based sequence modeling to detect various attack types such as spoofing, fuzzing, and DoS.
– Demonstrated improved detection accuracy and adaptability by dynamically adjusting thresholds based on learned traffic behavior.

•**Development of a Large-Scale Fake News Dataset and Transformer-Based Detection Models**
***Tools, Programming Languages & Libraries:*** *Hugging Face Transformers, PyTorch, BERT, LLaMA, Pandas, Scikit-learn, Python*
– Collected, cleaned, and compiled a large-scale fake news dataset of over 50,000 articles from diverse open-source platforms for misinformation research.
– Designed and executed experiments using multiple transformer-based language models (BERT, LLaMA, RoBERTa) for binary classification of real vs. fake news.
– Evaluated model performance across architectures and conducted interpretability analysis using attention mechanisms to explore how models detect misinformation.

## Courses and Trainings

–**Introduction to Blockchain** *2023*
*Udemy*

–**Introduction to Cybersecurity** *2023*
*Udemy*

–**Web Development** *2022*
*Udemy*

–**Mobile Development** *2022*
*Udemy*

–**Logo Designing Workshop** *2022*
*COMSATS University Islamabad, Wah Campus*

–**Kali Linux - Hacking Challenges** *2022*
*Udemy*

## Referees

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