

Sidrah Liaqat

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EDUCATION

Ph.D. Electrical Engineering **University of Kentucky, USA** (Expected: December 2025)
MS Electrical Engineering, GPA: 3.85/4.00
BE Electrical Engineering, GPA: 3.57/4.00
National University of Sciences and Technology (NUST), Pakistan

TECHNICAL SKILLS

Domain Knowledge: Human-Computer Interaction (HCI), Healthcare Data Analysis, Bioacoustics, Behavior Analysis
Programming Languages: Python (Expert), C++ (Proficient), C# (Proficient)
Machine Learning Frameworks: PyTorch, TensorFlow, OpenCV, Detectron2
Machine Learning Architectures: CNN, RNN, HMM, Transformer, Time-Series Analysis

RESEARCH EXPERIENCE

Graduate Research Assistant, *University of Kentucky, USA*

Partially supported by NIH-R01-MH121344 Research Grant

Jan. 2020 – Present.

- Developed a transformer-based model to analyze face and eye landmarks from infant videos to detect visual attention patterns indicative of autism risk, contributing to early diagnosis tools.
- Utilized PyTorch and OpenCV to process video, implementing algorithms for feature extraction and model training.
- Improved detection accuracy by 12% and AUC-ROC by 5% by incorporating positional information of individuals' heads and temporal dynamics capture.

Autism Diagnosis of Children from Eye Gaze using Synthetic Saccade Generation

Jan. 2019 – Dec. 2019

- Developed a CNN-based classifier to identify children with ASD using synthetic saccade data generated from a neurotypical scan-path baseline, achieving 62% accuracy.

Bird Audio Detection

May. 2018 – Jul. 2018

- Developed a weighted ensemble of CNN classifiers for bioacoustic signal analysis, achieving the highest-scoring open-source method in the DCASE 2018 challenge.

INDUSTRY EXPERIENCE

Digital Signal Processing Engineer, *Microwave Engineering Research Laboratory (MERL)*

Pakistan

Jul. 2007 – Jun. 2011

- Led the design and development of a C#-based GUI application for real-time radar data visualization and control, enabling operators to monitor pedestrian and vehicle detections.
- Developed automatic target classification for a real-time ground surveillance radar using machine learning (k-NN, SVM, Logistic Regression), enhancing situational awareness.
- Implemented a user-friendly interface with multiple display modes (digital maps, digital elevation models), interactive zoom/pan capabilities, and clickable targets for detailed information (speed, direction, classification).
- Developed an experimental mode for classification and differentiation of slow-moving pedestrian and vehicle targets.
- Implemented portions of the radar's digital signal processor on TI C6000 series DSPs, processing data at rates up to 40 MBps from an FPGA, demonstrating experience with real-time performance constraints.
- Collaborated with a team of researchers to successfully complete field trials of the radar system, funded by a USD 0.5 million grant from the Ministry of Science and Technology.

AWARDS AND RECOGNITION

Top Reviewer Recognition Certificate, [IEEE International Conference on Image Processing \(ICIP\), 2024](#)
First Prize in Student Poster Competition, [4th Annual Commonwealth Computational Summit, UK CCS, 2020](#)
Highest-Scoring Open-Source Method, [Bird Audio Detection Challenge, DCASE, 2018](#)
Recipient of 75% GPA Based Honorary Scholarship, NUST, 2003-2007
Second Position, National Level Computer Project Competition COMPPEC, 2006

SELECTED PUBLICATIONS

"Predicting ASD diagnosis in children with synthetic and image-based eye gaze data", *SPIC*, 2021.
"Machine Learning Based ASD Detection from Videos", *IEEE HEALTHCOM*, 2020.
"Predicting Autism Diagnosis using Image with Fixations and Synthetic Saccade Patterns", *ICMEW*, 2019.
"Domain Tuning Methods for Bird Audio Detection", *DCASE*, 2018.