

HABIBAH HASSAN

CONTACT

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CONFERENCE PRESENTATIONS

Presented two research papers at the **IEEE International Symposium on Phased Array Systems and Technology (ARRAY 2024)**, held in **Boston, USA**, from October 15–18, 2024.

- “Deep learning based DOA estimation in low SNR and multipath scenarios”
- “Performance comparison of subspace and sparse-based algorithms”

<https://ieeexplore.ieee/document/10880423>
<https://ieeexplore.ieee.org/document/10880393>

Both papers have been published.

EDUCATION

MS
Masters In Electrical Engineering
(Wireless Communication)

Institute of Space Technology, Islamabad
Pakistan

2015-2019

CGPA : 3.77/4.0

BS
Bachelors in Telecommunication Engineering

Foundation University, Islamabad
Pakistan

2011-2015

CGPA : 3.96/4.0 (Gold Medal)

PROFILE

A highly skilled engineer with strong analytical and problem-solving abilities, adept at resolving complex issues and meeting tight deadlines. I have excellent communication, leadership, and teamwork skills. I can work efficiently in academic research environments. Able to collaborate with both technical and non-technical teams and can tackling demanding challenges.

WORK EXPERIENCE

Research Fellow

Strategic Plans Division (SPD), Islamabad, Pakistan 2017-2019

- Explored the use of Deep Neural Networks (DNNs) for Direction of Arrival (DoA) estimation
- Highlighted their superior performance and speed compared to traditional methods.
- Identified different DoA Algorithms strengths and weaknesses in different scenarios.
- introduced a cutting-edge deep learning method for estimating the direction of electromagnetic waves, which performs well in low Signal-to-Noise Ratio (SNR) and coherent signal conditions, achieving an RMSE of ~ 0.02 to ~ 0.003 .
- Worked on CNN architecture and regression results, offered insights into advancements in DoA estimation.

Teacher (Physics)

Siddeeq Public School, Rawalpindi, Pakistan, 2017-2021

- Teach physics concepts and principles to secondary school students.
- Create and implement lesson plans and educational materials.
- Design and administer tests, quizzes, and assignments; evaluate student progress.
- Offer additional assistance and resources to help students understand the material.
- Maintain discipline and foster a positive learning environment.
- Keep accurate records of student performance and attendance.
- Collaborate with colleagues to align curriculum and share teaching strategies.
- Adjust and manage timetables to accommodate academic schedules and student needs.

Senior Instructor Electrical

Askari Institute of Technology, Rawalpindi, Pakistan 2015-2016

- Oversee and assign tasks to faculty and staff within the department.
- Mentor faculty members to support and guide them towards excellence in teaching, service, and research.
- Promote and support engagement in professional development and research activities.

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AWARDS & GRANTS

- Got Fellowship in Strategic Plans Division (SPD).
- Got Funded project from SPD.
- Got merit scholarship in all semesters of Masters.
- Awarded Gold Medal in bachelors
- Awarded Certificate of Distinction in Bachelors.
- Got Funded project from CARE (Center of Advanced Research in Engineering)
- Got merit based scholarship in all semesters of Bachelors.
- Got merit based scholarship in High School.

TECHNICAL SKILLS

- HFSS
- Multisim
- COMSOL multiphysics
- LabView
- Circuit maker
- C++/C#
- Code Composer Studio (CCS)
- MATLAB
- python
- Design/ debug code
- Digital Signal Processing techniques

LANGUAGES

- English (Duolingo Score 125/160)
- Urdu (Native Language)

PROJECTS

Deep Learning Based DOA Estimation in Low SNR and Multipath Scenarios

Master of Science in Electrical Engineering

- Investigated the application of Deep Neural Networks (DNNs) for Direction of Arrival (DoA) estimation,
- Proposed method has enhanced performance and computational efficiency over traditional methods.
- Evaluated various DoA algorithms and highlighted their benefits and limitations in different contexts.
- The research presents a state-of-the-art deep learning method for estimating the direction of electromagnetic waves,
- Demonstrated effectiveness in low Signal-to-Noise Ratio (SNR) and coherent signal scenarios with an RMSE between ~ 0.02 and ~ 0.003 .
- Provided a detailed analysis of CNN architecture and regression results.
- Showed the advancement in the field of DoA estimation and offered new opportunities for further research.

DSP Implementation of Data Compression and Decompression over SDR platform

Bachelors of Science in Electrical Engineering

- SDR is Software Defined Radio which is used in defence applications.
- The main goal of communication is to transfer data efficiently with minimal delay.
- Compression reduces data size by eliminating redundancies, with techniques categorized into lossy and lossless.
- Implemented lossless methods (LZ77, LZ78, LZW) in C# and tested them using Wireshark to capture and compress data.
- A TCP/IP client-server model was used, where data was compressed on one laptop and decompressed on another.
- The impact of redundancy on compression ratios were also demonstrated.