Mahnoor Fatima Saad

PhD, Research Assistant

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Education

PhD - University of Utah, U.S.A — Salt Lake City, UT

Computer Science, Specialization: Computer Vision and Multimodal Learning — *Aug 2023 – Present*

- Advisor: Dr. Neal Patwari, PI SPAN Lab
- Research Area: Multimodal Scene Representation Learning — from audio-visual scene perception to RF/channel (CIR) modeling for wireless systems and spectrum sharing

BS - COMSATS University, Islamabad — Islamabad, PK

Software Engineering — *Aug 2017 – May 2021*

- CGPA: 3.77, Graduated Magna Cum Laude

Publications

1 **Mahnoor Saad**, Ziad Al-Halah. "*How Would It Sound? Material-Controlled Multimodal Acoustic Profile Generation*." In **Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)**, 2025.

2 **Mahnoor Saad**, Sagnik Majumder, Kristen Grauman, Ziad Al-Halah. "*Materealistic RIR: Material Conditioned Realistic RIR Generation*." In **Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), Findings Workshop**, 2026.

Research Projects

Multimodal Channel Impulse Response Estimation — *In Progress*

- Predicting real-world, outdoor Channel Impulse Response (CIR) for arbitrary transmitter-receiver locations using multimodal environmental features
- Using POWDER testbed to obtain training data for real-world CIRs and testing learned methods
- Improving Radio-Frequency, pathloss models for more accurate downstream spectrum sharing capabilities
- Creating custom transformer-based architecture and losses to learn accurate CIR estimations

Realistic Material-Aware RIR Estimation — *CVPR Findings 2026*

- Improving on existing SOTA work by isolating the impact of materials in the scene on the acoustic profile
- Explicit detangling of spatial and material cues for accurate, vision-only RIR estimation that generalizes across spaces and material distributions
- Training and designing a novel multimodal transformer-based architecture to predict acoustics from vision alone

Material-Conditioned Acoustic Profile Generation — ICCV 2025

- Novel task of predicting the acoustic profile (RIR) of a space conditioned on user-defined materials
- Constructed a new large-scale audio-visual dataset consisting of material-conditioned acoustics by using embodied agents in SoundSpaces using Habitat AI simulator
- Achieved SOTA and established new baselines for this novel task

Teaching Experience

CS6962: Automatic Speech Recognition and Accent — University of Utah
Teaching Assistant — *Spring 2026*

- Conducted tutorials on Python fundamentals and PyTorch for machine learning applications
- Led sessions on building custom speech classification models and end-to-end ML workflows
- Taught evaluation of state-of-the-art ASR systems for bias in accent and speech
- Guided students in using CHPC resources for large-scale training and experimentation

CS6960: Multimodal LLM Agents — University of Utah
Teaching Assistant — *Spring 2026*

- Mentored and supervised student projects, guiding development and technical execution
- Graded assignments, projects, presentations, and provided detailed feedback and mentorship to further MLLM project execution

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Industry Experience

PhotoGAUGE Inc./ Konstant Variables — Islamabad, PK
Machine Learning Engineer — *Dec 2021 – Sep 2022*

- Designed lightweight and deployable multimodal 3D mesh reconstruction, key point detection, and object segmentation of indoor scenes - automating human-oriented tasks for industry
- Designed, trained, and deployed custom StyleGAN and 3D human face reconstruction to build personalized avatars and NFTs using single/multi-view 2D images
- Integrated ML workflows for the company on Kubernetes

Pakistan Telecommunication Company Ltd. (PTCL) — Islamabad, PK
Assistant Manager - Data Science — *June 2021 – Nov 2021*

- Contributed to the development of the country's first data analytics initiative in telecommunications
- Generating business ad hoc reports for internal and external teams and Etisalat International Group for UAE and Pakistan
- Using Teradata Vantage to extract, analyze, and plot key performance indicators for deep dive analytics and customer engagement analysis used for country-wide campaigns

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Technical Skills

Programming Languages:	Python, C, C++, Java
Audio & Vision Processing:	Librosa, torchaudio, Seaborn, torchvision
Simulation & Embodied AI:	Habitat-Sim, Habitat-Lab, Matterport3D, Replica
Deep Learning Frameworks:	PyTorch, TensorFlow, HuggingFace Transformers
Machine Learning Tools:	NumPy, Pandas, Scikit-learn, OpenCV, Matplotlib, Weights & Biases (W&B), AWS Sagemaker, AWS EC2/ECR, Docker, Kubernetes, Teradata Vantage, Anaconda, Jupyter

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Service

Graduate Women in Computer Science — University of Utah
PhD Chair — *Dec 2023 – present*

- Set up and started the Graduate Women in Computer Science organization to provide a space academic, personal, and professional growth for female-identifying graduate students at the Kahlert School of Computing at the University of Utah

- Organized and led academic and professional development workshops aimed at supporting and empowering women in Computer Science
- Developed and implemented structured pipelines connecting faculty, staff, and graduate students to foster a more inclusive, supportive, and collaborative graduate school environment

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Awards and Recognition

Kahlert Impact Award 2026 University of Utah

- Awarded in recognition of outstanding service and research at the Kahlert School of Computing at University of Utah

Student Spotlight Summer 2025 University of Utah

- Nominated by the Graduate Student Advisory Committee for student spotlight interview at the Kahlert School of Computing at University of Utah COMPUTE Magazine Summer 2025 Issue.