# Geet Khatri

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## Education

**North Carolina State University** — Raleigh, NC
Ph.D. in Electrical Engineering · GPA: 4.00/4.00 — Fall 2021–Present

**Delhi Technological University** — New Delhi, India
B.Tech. in Electronics and Communication Engineering · CGPA: 8.45/10.00 — 2014–2018

## Experience

**Active Robotic Sensing (ARoS) Lab, NC State University** — Raleigh, NC
Graduate Research Assistant — August 2023–Present

- Applying speech recognition (ASR), speech representation models and large language models (LLMs) to multimodal dementia detection with an emphasis on interpretability, trustworthiness and privacy
- Modeling biosensor response to extracellular histones in blood using physics-informed neural networks
- Developing an anomaly detection pipeline for physiological signals obtained from sleep studies

**Department of Electrical and Computer Engineering, NC State University** — Raleigh, NC
Graduate Teaching Assistant — August 2022–Spring 2024

- "ECE 542: Neural Networks" in Spring 2024 and Spring 2023, "ECE 516: Systems Control Engineering" in Summer 2023, and "ECE 308: Elements of Control Systems" in Fall 2022

**Advanced Diagnosis, Automation, and Control (ADAC) Lab, NC State University** — Raleigh, NC
Research Assistant — August 2021–August 2022

- Applied signal processing and machine learning algorithms to ultrasonic fault detection for nuclear reactor shells as part of a research project for the Department of Energy's Nuclear Energy Enabling Technologies (NEET) program
- Modeled the open-circuit voltage of batteries with neural networks

**UBS** — Pune, India
Software Engineer — 2018–2021

- Worked on data visualization, identification of trends in data, and predictive modeling
- Developed tools for enforcement and tracking of organizational controls

## Skills and Coursework

- **Languages:** Python, MATLAB, R, C, Bash, SQL, HTML, CSS
- **Software/Frameworks:** MATLAB/Octave, PyTorch, TensorFlow, Git, Tableau, Excel, LaTeX
- **Relevant Coursework:** Deep Learning, Pattern Recognition, Data Science, Optimization, Probability & Random Processes, Information Theory, Statistics, Bayesian Analysis, Graph Models, Digital Signal Processing, Audio Signal Processing, Detection & Estimation Theory, Image Processing, Computer Vision, Control Systems, Optimal Control, Functional Analysis, Harmonic Analysis

## Publications

1. **Khatri, G.**, Soleimani, R., Haley, K. L., Jacks, A., & Lobaton, E. (2024). Alzheimer's Disease Classification From Speech Pause Distributions With Context Information. *46th Annual International Conference of the IEEE Engineering in Medicine & Biology Society.*
2. **Khatri, G.**, Haley, K. L., Jacks, A., & Lobaton, E. (2024). Automated Extraction of Speech-Based Measures at Syllable-Level Granularity for Diagnosing Apraxia of Speech. *Clinical Aphasiology Conference.*
3. Barahona, J., Richardson, H., Acosta, L., **Khatri, G.**, Miller, F., Pavlidis, S., & Lobaton, E. (2024). Histones Classification Based on EGFET Signals. *46th Annual International Conference of the IEEE Engineering in Medicine & Biology Society.*

## Academic Projects

- **Trigger Word Detection**: The trigger word detection model comprises a recurrent neural network (RNN). The STFT of an audio is fed to the network, and the model triggers an action when it detects the trigger word in the audio.
- **Speech Enhancement Using Wiener Filtering and Pitch-Synchronous STFT Phase Reconstruction** *(Undergraduate Thesis)*: The algorithm reconstructs the phase spectrum of the pitch-synchronous STFT of the speech signal. Certain properties of the pitch-synchronous STFT of harmonic signals make estimation of the phase spectrum faster and more robust to noise compared to phase reconstruction of constant–window size STFT. The magnitude spectrum is estimated using Wiener filtering.