

CHARU SHAH

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EDUCATION

University of Pennsylvania

Master of Science in Engineering in Electrical Engineering

Philadelphia, PA

May 2027

National Institute of Technology Karnataka, Surathkal

Bachelor of Technology in Electrical and Electronics Engineering, Minor in Computer Science

Mangalore, India

May 2025

EXPERIENCE

Nanyang Technological University

Speech Processing Research Intern

Remote (Singapore)

May 2024 - Oct 2024

- Focused on depression detection using speech by developing preprocessing workflow utilizing Whisper and WavLM
- Extracted 6,552 low-level descriptors and prosody features and then retained 94.94% of the variance using PCA
- Implemented classifiers like SVM, CNN and Transformer to enhance feature analysis and improve performance

SPIRE Lab, Indian Institute of Science (IISc)

Summer Research Intern

Bangalore, India

Jun 2023 - Jul 2023

- Published a corpus paper titled 'SPIRE-SIES: A Spontaneous Indian English Speech Corpus' at COCODA 2023
- Worked with over 170 hours of crowd-sourced speech data to address the gaps in Indian English speech resources
- Analyzed nativity distribution by generating histograms and utilizing Voice Activity Detection to remove silent files
- Achieved 96% accuracy in verifying user-specified gender labels using a pre-trained model, ensuring high data quality

PROJECTS

Deepfake Image Recognition – Python, GANs, Feature Extraction

Dec 2023 – May 2025

- Aimed to detect deepfakes to address the growing concerns of misinformation, privacy invasion, and security risks
- Generated a custom dataset of fake face images by training StyleGAN and diffusion models on FFHQ dataset
- Applied the Discrete Cosine Transform to highlight the artifacts that separate real images from fake ones
- Achieved 99% accuracy using a ridge classifier on GAN generated images and compared it with diffusion model images

Noise Removal in ECG Signals – MATLAB, Git, Signal Denoising

Sep 2023 – Nov 2023

- Aimed to significantly improve ECG signal clarity for accurate diagnostics by developing robust denoising techniques
- Implemented Empirical Mode Decomposition (EMD) and Discrete Wavelet Transform to enhance noise reduction
- Synthesized both these methods into a hybrid model along with an advanced Adaptive Switching Mean filter
- Achieved Signal-to-Noise Ratio (SNR) improvement of 4 dB with the hybrid model, demonstrating highest effectiveness

LEADERSHIP

IEEE, National Institute of Technology Karnataka – Women in Engineering Chair

Aug 2022 - May 2024

- Led initiatives for women in engineering, including organizing talks on 'Perspectives from Women in Tech'
- Organized a 24-hour hackathon focused Signal Processing with the theme of explainable AI applications
- Delivered a talk on summer research programs as part of Eureka, a three-day program designed for first-year students

Sunrises - Worth Waking Up Early For! – Founder

Dec 2021 - May 2022

- Started a non-profit club dedicated to providing career guidance to underprivileged students from 15+ schools
- Designed and taught foundational mathematics lessons to middle school students to bridge their learning gaps

ACHIEVEMENTS

Shenomics: Supported the founder in enhancing her LinkedIn visibility and strengthening audience engagement

Advancing Inclusion Scholar: Selected by AnitaB.org to attend Grace Hopper Celebration India 2024 in Bangalore

Co-CEO NITK, Open Secret: Managed sales of over 25,000 INR worth of food products within the college campus

Emcee: Hosted the inauguration ceremony for Incident, one of India's largest college festivals, attended by 40,000 people

Creative Writing: Published a mystery novel titled 'The Strange Call' in 2019 and regularly blogs on my personal website