Poorva Satish Bedmutha

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EDUCATION

University Of California San Diego — San Diego, CA
Doctor of Philosophy (PhD), Electrical and Computer Engineering (Signal and Image Processing)
Relevant Coursework: Recommender Systems, Statistical Learning, Digital Image Processing, Data Analysis

Pune Institute of Computer Technology (SPPU, University of Pune) — Pune, India
Bachelor of Engineering (Electronics and Data Science) - Valedictorian — Graduated: Jul'22
Relevant Coursework: ML, Operating Systems, Data Structures, Image Processing, Data Visualization, Digital Signal Processing

SKILLS

Programming Languages: Python, MATLAB, Java, C/C++, HTML, CSS, SQL
Libraries: Tensorflow, PyTorch, SkLearn, Keras, Numpy, Pandas, OpenCV, Scipy, mne-Python, Flask, BeautifulSoup, MIR
Frameworks and tools: Git, MySQL, Android Studio, Unity, Firebase, AWS

PUBLICATIONS

S Artiran, PS Bedmutha, P Cosman, Analysis of Gaze, Head Orientation and Joint Attention in Autism with Triadic VR Interviews, IEEE TNSRE Journal - Neural & Rehab Engineering (IEEE TNSRE'24)

S Artiran, PS Bedmutha, A Li, P Cosman, Gaze and Head Rotation Analysis in a Triadic VR Job Interview Simulation, 22nd IEEE International Symposium on Mixed and Augmented Reality (ISMAR'23)

MS Bedmutha, PS Bedmutha, Nadir Weibel. 2023. Privacy-Aware Respiratory Symptom Detection in the wild. WellComp at ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp/ISWC '23) [Best Paper Award]

PS Bedmutha et al. SciPred: An end-to-end approach to classify predatory journals. CODS-COMAD '22

P Pandey, PS Bedmutha, KP Miyapuram, D Lomas. Stronger correlation of music features with brain signals predicts increased levels of enjoyment, 2023 IEEE Applied Sensing Conference (APSCON '23)

PS Bedmutha et al., Canonical correlation analysis (CCA) reveal neural entrainment for each song and similarity among genres. Society for Music Perception and Cognition Conference, 2022 (SMPC'23)

Shubhankar Goje, Poorva Bedmutha, Prajwal Shah, Jagruti Agrawal. Cascaded PID control system for UAV with gain factor prediction using ML, iJRASET'21

RECENT WORK EXPERIENCE

Machine Learning Researcher — June'23 – Present
UCSD Health — Heidi Rataj, Karandeep Singh — *Python, Scikit-learn, Docker, AWS, NLP, Recommender Systems*

- Leading design, development & deployment for Willo (student wellness app) currently used by 10,000+ students
- Designing recommendation system for presenting health services & campus events for Willo as a mental health product

Research Assistant — Oct'22 – Present
Cosman Lab, UCSD — Prof. Pamela Cosman — *San Diego, CA*
Time-series data, VR, Anomaly Detection, LSTM, Unity, Experiment design, ML, NN

- Investigating human behavior from VR data by designing a VR app to model neurodivergent behaviors during interviews

- Designing & conducting user studies, and performing quantitative & qualitative analyses to assess needs/usability
- Develop novel algorithms for VR gaze calibration; study head orientation and joint attention [ISMAR'23] [IEEE TNSRE'24]

Research Intern   June'23 – Sept'23

Audio Spatialization Laboratory @ Qualcomm Institute — Prof. Shahrokh Yadegari   *Audio signal processing, CUDA, C++, Software development, Blender*

- Creating personalized HRTFs using Sapce3D, a real-time virtual raytracing & environment-aware audio spatializer software
- Generating high-resolution 3D models of human head from 2D images to test the ray tracing algorithm for reflections

Graduate Student Researcher   Oct'22 – Apr'23

MOSAIC Lab, UCSD — Prof. Tauhidur Rahman   *San Diego, CA*

Machine Learning, Signal Processing, EEG

- Analyzed physiological data from different sensors to understand their implication and association with opioid misuse
- Designed EEG-based multimodal signal processing & ML pipeline to beat existing classification model accuracy by 9%

Research Intern   Jun'21 - Aug'22

Center for Cognitive and Brain Sciences, IIT GN — Prof. Krishna Miyapuram, Prof. Derek Lomas   *IIT Gn, India*

Acoustic Audio Signal Processing, Music Information Retrieval, Machine Learning, EEG

- Correlate brain responses to music with CCA using a complete pipeline for preprocessing and acoustic feature extraction
- Predicted song enjoyment with 26% above chance-level accuracy using only acoustic features[IEEE APSCON'23][SMPC

Task Lead & ML Engineer   Jul'21 – Aug'21

Omdena   *Remote (Paris, France)*

Project Management, Time-series analysis, Data Visualization, Tableau

- Led a team of ML Engineers to deliver an end-to-end data solution - analysis, visualization & dashboard
- Measured and reported insights on the impact of reduced mobility and traffic on air quality during the lockdown period

SELECTED PROJECTS

Detecting predatory journals from text. *NLP, Web scraping, BeautifulSoup, Data Processing, BERT* Jan'21 - Jun'21

Formulated a text-based algorithm to identify predatory journals with inadequate review systems using text embeddings from SciBERT and an MLP classifier [ACM CoDS COMAD'22]. Cleaned and preprocessed the dataset for the task; achieved an average F1 score of 0.92, beating baselines by 8%.

Privacy-Aware Energy-Efficient Respiratory Symptom Detection. *SciPy, Acoustic Features, Decision Tree, ML* Dec'22

Created a Machine Learning pipeline that is privacy-preserving & energy-efficient to detect coughs & sneezes in the wild. Achieved overall 70% & 57% sensitivity on audio classification even at low sampling rates 1kHz [UbiComp'23][Best Paper].

SpO2 and Heart Rate measurement using smartphone camera flashlight. Mar'20

Implemented a smartphone-based solution for non-invasive measurement of blood vitals by processing finger videos. Obtained heart rate with signal processing & use linear regression to predict SpO2 with RMSE of 3.6 bpm & 0.95% resp.

Semantic Segmentation on Lung CT Scans. *Image Segmentation, Tensorflow, ResNet* Dec'21
Developed a RESNET-based image segmentation model for 2D CT lung scans & achieved an improved accuracy of 94.2%. Designed a context encoder neural network with dense convolution (DAC) & residual multi-kernel pooling (RMP) blocks.

Emotion-based Music Player. *CNN, TensorFlow, Image Classification, Android Studio, Google Firebase, SQL*
July'21
Created a CNN model with 96.8% accuracy to classify emotions using facial expressions & suggest a playlist to suit the mood by clustering songs by their valence and arousal characteristics [Best project : ESMP'21 proceedings]. Developed an Android app with Firebase database and TensorFlow Lite library to process images & redirect to Spotify.

Friction Prediction from Motion. *Blender, Object Detection; Physics-informed Neural Networks* May'23
Created an augmented dataset of the videos of interactions of various surfaces with textured balls in 3D using Blender. Predicted friction from the videos with object detection in computer vision and physics-informed neural networks (PINN).

PulsePal: Innovative wearable technology solution in heart health management. *Design prototyping, HCI, UX* May'23
Designed the prototype of a device for heart attack prediction using tracking of multiple physiological parameters. Conducted iterative product design through continuous feedback based on human-centered design principles.

ACHIEVEMENTS

Best Paper Award - ACM UbiComp'23

Graduate Conference Scholarship Awardee - CSE GradWIC UCSD (2023)

ECE Department Gold Medalist (SPPU) - 1st ranked across the entire university (2018-2022)

Tapia Scholarship Awardee - outstanding women in tech (2023)

IEEE IBM Women in Science and Computing Awardee (2022)

SERVICE

Reviewer - ICASSP (2025), IEEE ISMAR (2025), IEEE ISMAR (2024), CHI Late Breaking Work 2023

ECE Dept Student Representative (PICT) - Elected senate representative for the entire Class of 2022 (2021-22)

Student Volunteer at UbiComp/ISWC'23 (2023)

President (2024) and Vice President (2023) for CSE Society for Graduate Women in Computing [GradWIC]

UCSD ECE Dept Graduate Student Council (2022-2024) [Annual Award for Best Service 2022]

Lead Organizer [ECE 290] - end-to-end organization of weekly industry + academia seminar series entirely (2022-23)

UCSD Graduate Student Senate representative; Executive Committee of the Election Council (2023)