Puru Soni

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EDUCATION

University at Buffalo, The State University of New York
Bachelor of Science, Computer Engineering, Anticipated May 2026
Honors Student, Dean's List, **GPA: 3.9/4.0**

EXPERIENCE

Research Assistant, MindVoice Research Project, *May 2023 – Present*
Embedded Sensing and Computing (ESC) Group, University at Buffalo, Buffalo, New York

- Collaborating on a research project, mentored by Wenyao Xu, to improve Automatic Speech Recognition (ASR) for people with speech impairments by adopting a combination of Audio and Brainwave (EEG) data.
- Windowed EEG and converted to Frequency Domain Cross Covariance Matrixes leveraging NumPy.
- Took an innovative approach and implemented CLIP architecture utilizing TensorFlow to get the Audio and EEG in same feature space, with a GRU based encoder for Audio MFCCs and CNN Transformer for EEG.
- Communicating with hardware team to deploy TensorFlow Lite model on ESP32-S3 microcontroller.

Research Assistant, Last Mile Delivery Drone Research Project, *May 2023 – August 2023*
Adaptive Design Algorithms, Models & Systems (ADAMS) Lab, University at Buffalo, Buffalo, New York

- Led a team of 3 in developing a robust Python app for First-Person View (FPV) flight leveraging the Kivy library for GUI and OpenCV for camera feed processing while making extensive use of Git and GitHub.
- Implemented multiprocessing to avoid camera lag while retrieving real-time drone state data from Pixhawk.
- Conducted experiments at UB Structure for Outdoor Autonomy Research (SOAR) with team.

Research Assistant, Crazyflie Swarm: A Large Nano-Quadcopter Swarm, *May 2023 – August 2023*
Adaptive Design Algorithms, Models & Systems (ADAMS) Lab, University at Buffalo, Buffalo, New York

- Learned ROS and acclimated to Linux Virtual Machine (UTM) and VICON Motion Capture Lab at UB.
- Employed Crazyswarm 2 library by Wolfgang Hönig (IMRClab) to control multiple Crazyflies at same time.

PROJECTS

JobMatch: Job Application App, *September 2023 – September 2023*

- Led a hackathon team of 5 to develop a job application app inspired by Tinder employing React Native.
- Implemented user-friendly job-post card swiping and collaborated on recruiter-applicant messaging feature.
- Helped integrate with cloud based backend built using Node.js, Moleculer microservices, and MongoDB.

AutoTA: LLM Teaching Assistant, *November 2023 - Present*

- Collaborated on LLM chatbot that assists students with queries in manner consistent with academic integrity.
- Spearheaded integration of Django backend with OpenAI's API using object oriented programming in Python to maintain context of previous student messages for coherent follow-up interactions.
- Led vector search implementation utilizing NLP enabling efficient context retrieval from course documents.
- Won 2nd prize of $1000 at UB Hacking Hackathon 2023, with plans to port to Llama 2 and commercialize.
- Engaging with university faculty with plans to test AutoTA for introductory CSE courses during Spring 2024.

OneStop: Personal Management App, *November 2021 – January 2022*

- Teamed up and implemented backend with Python and SQL and user-friendly GUI utilizing Kivy framework.
- Developed a multiplatform app integrating useful functionalities such as Pomodoro timer, Password Manager, Tasks, Alarms, and Timer with a captcha protected and encrypted secure login system.

SKILLS

- **Software Development**: Python, C, Java, JavaScript, HTML, CSS, Git, Linux, SQL, Node.js, React Native
- **Embedded Systems**: ROS2, Arduino, Raspberry Pi, Pixhawk, Crazyflie, VICON Motion Capture
- **Machine Learning**: PyTorch, TensorFlow, TFLite, Feature Extraction, Image Processing, NLP

ORGANIZATIONS

IEEE Student Chapter at University at Buffalo, *Buffalo, NY, September 2022 – November 2023*