Varun Venkat Rao

varu@umich.edu • (269)-501-7224 • Ann Arbor, MI

EDUCATION

University of Michigan | GPA: 4.0 / 4.0 **Ann Arbor, MI**
M.S. in Electrical Engineering | Signal Processing and Machine Learning Track *August 2021 - December 2023*
Tau Beta Pi Engineering Honors Society | Eta Kappa Nu Honors Society

Michigan State University | GPA: 3.9 / 4.0 **East Lansing, MI**
B.S. in Electrical Engineering with High Honors | Biomedical Concentration *August 2016 – December 2020*

WORK EXPERIENCE

Mayo Clinic **Rochester, MN**
Electrical Engineering Intern *June 2022 – December 2022*

- Designed and developed a groundbreaking deep brain stimulation device to investigate the effects of dopamine release in the brain. Spearheaded the entire product development process, from assembling prototype systems and performing design verification and validation to troubleshooting electrical systems using complex engineering drawings
- Collaborated with surgeons & healthcare professionals in a multidisciplinary cross-functional team environment to ensure the development of strategic customer focused solutions by leveraging clinical expertise, insights, and feedback
- Utilized MATLAB to develop highly efficient instrumentation drivers, enabling remote control of electronic bench equipment. Achieved a 32% reduction in testing time & improved testing reliability by automating testing procedures

RESEARCH EXPERIENCE

Michigan Medicine **Ann Arbor, MI**
Graduate Researcher *May 2023 – August 2023*

- Created an innovative radiology report summarization model using strategic prompt engineering techniques for instruction-based language models to help reduce the burden on healthcare facilities with radiologist shortages
- Achieved a 21% improvement in summarization quality, enhancing the accuracy and relevance of generated summaries

MSU Non-Destructive Evaluations Laboratory **East Lansing, MI**
Undergraduate Researcher *January 2019 – May 2021*

- Contributed to the development of a research paper on the topic of ML for non-destructive testing, which was accepted for publication in a peer-reviewed journal. Designed experimental procedures and composed technical reports
- Delivered project updates to senior leadership, fostering efficient communication and alignment with project objective

MSU Nano-Biosensors Laboratory **East Lansing, MI**
Undergraduate Researcher *August 2020 – December 2020*

- Designed and developed a smartphone-based biosensor utilizing computer-vision based image processing techniques to help physicians detect antibiotic-resistant bacteria in clinical samples while also meeting regulatory requirements
- Created a comprehensive task schedule to complete the design & development of the project under minimal supervision

PROJECT EXPERIENCE

Melanoma Skin Lesion Classifier **Ann Arbor, MI**
Machine Learning *January 2022 – May 2022*

- Led a team of charismatic grad students, developing a cutting-edge deep learning network, which incorporated patient data and skin lesion images, achieving a performance boost of up to 20% over the state-of-the-art methods
- Researched existing skin lesion classifiers, and identified areas for improvement to enhance classification performance

Wearable Vitals Monitoring & Fall Detection Alert System **Ann Arbor, MI**
Real-Time Signal Processing *January 2023 – May 2023*

- Spearheaded the development of a real-time monitoring and alerting algorithm utilizing sensor fusion in C to analyze daily activity patterns, resulting in a fall detection accuracy of 92% and a heart rate monitoring accuracy of 90%
- Demonstrated exceptional problem-solving skills, working w/ diverse team members and providing engineering support

AREAS OF EXPERTISE

Computing Skills: **Python, Pytorch, TensorFlow, MATLAB, Julia, C, LATEX, Altium, SolidWorks, LABVIEW**