

Prerana Sriramkumar Lakshmanan

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EDUCATION	University of Michigan , Ann Arbor, USA2023–Present MS in Biomedical Engineering, Bioelectronics, and Neural Engineering Concentration GPA: 3.73/4.00 Relevant Coursework: Sensing and Machine Learning for Neural Interfaces (BIOMEDE 517), Introduction to Signal Processing and Machine Learning in Biomedical Sciences (BIOINF 580), Human Neuroanatomy (NEUROSCI 470), Introduction to MEMS (EECS 414), Mathematics of Biological Networks (MATH 540)
	Vellore Institute of Technology (VIT) , Vellore, India2019–2023 B.Tech. in Electronics and Communication Engineering GPA: 8.98/10 (3.907/4) Bachelor's Thesis: Creation and Validation of an Affordable and Accessible Framework for Movement Analysis using Inertial Measurement Units (IMUs) Relevant Coursework: VLSI System Design, Control Systems, Analog and Digital Communication, Semiconductor Devices and Circuits, Engineering Physics, Statistics, Fluid Mechanics, Analog and Digital Circuits, Network Theory
RESEARCH EXPERIENCE	Member, Opri Lab, University of Michigan, Ann Arbor November 2023–Present Mentor: Dr. Enrico Opri, Biomedical Engineering Department, University of Michigan, Ann Arbor, USA <ul style="list-style-type: none">Developing a robust neural-network to effectively model and filter artifacts in DLEPs (DBS Local Evoked Potentials)Spearheading brain connectivity research using CCEPs, analyzing 130 epilepsy patient records.Created real-time DBS lead localization system with DLEPs and BCI2000, performing testing with Alpha Omega's Neuro Omega. Control in Muscle Stretch Spinal Circuit June 2024–August 2024 Mentor: Dr. Lisa Li, Electrical Engineering and Computer Science Department, University of Michigan, Ann Arbor, USA <ul style="list-style-type: none">Modeled spinal circuit systems with control theory, leveraging feedback from muscle spindles and Golgi tendon organs.Developed computational models incorporating sensory-motor reflex pathways and neuron function to control muscle contraction and tension. Acrophase, IIT Madras Research Center, Project Intern January–June 2023 <ul style="list-style-type: none">Engineered Java-based motion capture software with IMU sensor fusion, achieving 96% accuracy validated against top off-the-shelf IMU, Xsens MVN Awinda.Formulated computational module in Python for heel strike and toe-off detection with 90% accuracy using IMU data; created for Netrin Sports Technologies MITACS Globalink Research Intern at Queen's University, Kingston June–August 2022 Project: Sensory Framework for Balanced Posture and Gait Mentor: Dr. Scott Yam, Electrical and Computer Engineering Department, Queen's University, Kingston, Canada <ul style="list-style-type: none">Constructed a sensory framework utilizing up to 16 inertial measurement units and kinematic solutions, for gait and posture study.Implemented IMU-based motion capture simulation on OpenSim, enhancing research efficiency and reducing setup time by 20 hours per month. Phase synchronization in coherent beam combining Winter 2021, August–December 2022 Mentor: Dr. Balaji Srinivasan, Electrical Engineering, IIT Madras, Chennai, India <ul style="list-style-type: none">Contributed to phase synchronization research using algorithms like Stochastic Parallel Gradient Descent (SPGD), for up to 4 lasers
PROJECTS	Using Beta Power as a biomarker for optimal stimulation parameters <ul style="list-style-type: none">Utilized NEURON to model basal ganglia circuits and consequently deep brain stimulationInnovated a clustering algorithm to accurately predict optimal stimulation paradigms using beta power as a biomarker to improve clinical outcomes by 40%,

Arrhythmia Detection and Classification using Convolutional Neural Network (CNN)

- Developed an eight-layer CNN for arrhythmia detection and classification, achieving 96% accuracy using the MIT BIH database.
- Utilized TensorFlow and Keras to implement advanced deep learning techniques, significantly enhancing diagnostic accuracy.

Self Navigating Robot using ROS

- Engineered an autonomous navigation robot using ROS, achieving reliable real-time path planning with 95% accuracy.
- Utilized gmapping and SLAM to enable precise environmental mapping and navigation for complex tasks.

ACADEMIC
AND
LEADERSHIP
EXPERIENCE

Graduate Student Instructor for A.I. in Biomedical Engineering August 2024 - Present
Teaching Assistant for BIOMEDE 487 under Dr. Sriram Chandrasekaran; delivered lectures on machine learning in Python and MATLAB, designed and graded assignments for 52 students

Member, Academic Affairs, BME Graduate Student Council January 2024 - Present
Active member of the Academic Affairs Committee, in the Biomedical Engineering Graduate Student Council. Ideated and organized seminars, mentor-mentee programs, and grant writing workshops

Organizing Committee Member, BME Symposium January –May 2024
Member of the organizing committee as Biomedical Engineering Graduate Student Council (BME GSC) Representative

Grader I January 2024 - April 2024
Grader for BIOMEDE 479 - Biotransport, with Dr. David Nordsletten, 18 student class

Academic Success Coach, Ross School of Business Aug 2023 - Dec 2023
Academic Success Coach for Math 105 (Pre-Calculus) to 8 students in the Ross Business School at the University of Michigan

Vice Chairperson, IEEE RAS (Robotics and Automation), VIT January 2021 - January 2022
Directed initiatives and led organizational efforts, organized seminars and hackathons, mentored 30 students

Kenyon-IITM Science Writing Workshop July 2021
Guided students at the workshop, providing critical feedback and fostering the development of advanced scientific writing skills.

SYMPOSIA
AND
WORKSHOPS

Symposia

- Attendee, Biomedical Engineering (BME) Symposium with Glen V. Edmonson Lecture, May 2024
- Attendee, Neural Engineering Training Program Research Symposium, May 2024

Workshops

- Participant, Kenyon-IITM Writing Workshop, Fiction Group, December 2020

SKILLS

Programming Languages: C/C++, Python, Java, Verilog, Assembly Language
Technical Skills: MATLAB, Multisim, Fusion 360, PSpice, ROS, PCB Design, OpenSim, Cadence, LTspice, Processing, COMSOL, OrCAD, BCI2000, NEURON, Simulink, LabVIEW
Others: Adobe Illustrator, Premiere Pro, L^AT_EX, Figma