Shankruth Balasubramaniyam

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PROFILE SUMMARY

- Gold Medalist – **Highest CGPA** at IIT Madras
- Robotics Research Experience – Interned at **BioRobotics Lab, Carnegie Mellon**, and **SMARTS Lab, University of Washington**
- Core Expertise – Robotics, Control Systems, Sensing & Perception, Computer Vision, SLAM, Bio-Inspired & Marine Robotics
- Technical Skills – Machine Learning, CAD Model Design

EDUCATION

Indian Institute of Technology Madras **CGPA: 9.25/10**
Bachelor of Technology in Ocean Engineering (2021-2025)
(Coursework: Control Systems, Introduction to robotics, Intro to motion planning, Computer Vision, Algorithms, Differential Equations, Probability and Statistics, Stochastic Processes, Machine Learning, Introduction to Programming, Basic Electrical Engineering, Engineering Mechanics, Analysis of Structures, Data Structures, Strength of Materials, Fluid Mechanics, Mobile Robotics)

Sri Sankara Senior Secondary School **Board Examination: 97.5%**
Higher Secondary Education 2021

EXPERIENCE

Robotics Engineering Intern - Biorobotics Lab, Carnegie Mellon University, Pittsburgh
July 2024 – Present
- Developing decentralized multi-agent reinforcement learning algorithms for Eigenbot, a six-legged robot designed for advanced locomotion and coordination.
- Working with Isaac Gym to simulate and train reinforcement learning models for robotic control.

Robotics Engineering Intern - SMARTS Lab, University of Washington, Seattle
July 2023 – Present
- Advisor: Dr.Ashis Banerjee
- Contributed to cutting-edge research on foreign object debris detection in fuel tanks, developing and optimizing real-time object detection algorithms , which improved recognition accuracy and system performance.
- Collaborated with ***Dr. Ashis Banerjee*** and the research team leading to a Masters thesis from the lab.
- Presented as late-breaking abstract at ***ICRA 2024***

Student Researcher - Marine Autonomous Vehicles Lab, IIT Madras
September 2022 – Current
- Advisor: Dr.Abhilash Somayajula
- Contributed to the design and deployment of a torpedo-shaped AUV for oceanic research.
- Authored and presented a paper on "Performance Evaluation of Different Control Algorithms for Torpedo-Shaped AUVs" at ***ASME OMAE 2024***, Singapore.
- Co-authored a paper titled "Avoiding Collision in Congested Maritime Environments Using Reinforcement Learning Algorithms," published at ***ASME OMAE 2024***, Singapore.
- Applied reinforcement learning techniques to solve multi-agent pursuit evasion problems in marine environments.

Student Researcher and Strategist - Robotics Lab, IIT-Madras
September 2022 – May 2024
- Advisor: Dr.Asokan Thondiyath
- Designed an underwater glider with a bellows mechanism for buoyancy control in high-pressure, deep-water environments.
- Developed pressure compensation designs for deep-sea use, optimizing power efficiency; pursuing a patent .
- ***Led a team of 14 undergraduates*** *to* ***SAUVC*** (Singapore Autonomous Underwater Vehicle Challenge) in 2024 as one of the top 30 teams worldwide to qualify for the finals.

PUBLICATIONS

- **Balasubramaniyam, S.**, et al. "Performance Evaluation of Different Control Algorithms for Torpedo-Shaped AUVs." International Conference on Offshore Mechanics and Arctic Engineering, ASME, 2024.
- Singh, A. N., Vijayakumar, A., **Balasubramaniyam, S.**, & Somayajula, A. "Deep Reinforcement Learning for Ship Collision Avoidance and Path Tracking." International Conference on Offshore Mechanics and Arctic Engineering, ASME, 2024.
- Patil, A., Lee, R., **Balasubramaniyam, S.**, et al. "Characterizing Robot Vision Solutions for Anomaly Detection in Confined Spaces." IEEE International Conference on Robotics and Automation (ICRA), 2024.

HONORS AND AWARDS

- State rank 5 in NSTSE (National Science Talent Search Examination)
- Best Paper Award at Inter-IIT Tech Meet 2022
- Best project award at open house 2024 - Centre For Innovation, IIT Madras
- Best Player Award in Football - 6 consecutive years
- Center for Innovation Best Project of the Year 2023-2024 IIT Madras

TECHNICAL SKILLS

- *Languages (Fluent):* Python, C/C++, MATLAB, Git, LaTeX, HTML
- *Software:* Object oriented programming, Docker, Linux
- *Frameworks and tools:* TensorFlow, PyTorch, Robot Operating System (ROS), Gazebo, SolidWorks, Fusion 360, Ansys, Simulink, TinkerCad, Arduino, RoboFlow, Ray, Photoshop