

ANEESH SINHA

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EDUCATION

Carnegie Mellon University Pittsburgh, PA
Master of Science in Mechanical Engineering - Applied Advanced Study Dec 2023
GPA: 3.90/4.0
Selected Coursework: Robot Localization and Mapping, Planning and Decision Making in Robotics, Robot Dynamics and Analysis, Advanced Controls Systems Integration, Modern Control Theory

Indian Institute of Technology (Indian School of Mines) Dhanbad, India
Bachelor of Technology in Mechanical Engineering June 2022
GPA: 8.33/10.0
Selected Coursework: Introduction to Robotics, Advanced Solid Mechanics, Numerical Methods and Statistics

SKILLS

Software: PLC Programming, MATLAB, Simulink, Inventor Professional, AutoCAD, SolidWorks, Cura
Productivity: Excel, PowerPoint, Word, Agile Frameworks (Trello)
Programming Languages/Frameworks: Python, C, C++, Karel, ROS, Pandas, NumPy, PyTorch, Socket
Robotic Simulation Environments: Gazebo, Webots, Isaac Sim, CoppeliaSim-VREP, RoboDK

EXPERIENCE

Robotics Intern May 2023 - Aug 2023
Voaiqe Inc. Pittsburgh, PA

- Spearheaded the development of **communication protocol** and **network architecture** for Voaiqe's vision-based software product, leveraging **TCP/IP**, **UDP**, and **DIO signals**, helping Voaiqe build its **1st production-level prototype**.
- Developed a robust test routine for the **Fanuc CRX 10iA** robot via socket messaging, enhancing product robustness.
- Deployed a fully integrated solution in an **onsite deployment** enhancing customer satisfaction by seamless integration.
- Engineered custom **Python** services to integrate the product with PLC's, thereby **boosting** product versatility.

Research Assistant - Gravity Compensation of a 6-RSS Parallel Robot Aug 2021 - May 2022
Indian Institute of Technology (ISM) Dhanbad, India

- Applied the **Decoupled Inverse Dynamic Model** approach via **MATLAB** to calculate joint torques, facilitating **real-time** gravity compensation of the robot.
- Led a team of 3 in developing a **CAD** model for a **6-RSS parallel platform**, facilitating testing via dynamic simulations.

PROJECTS

Warebots - Lifelong Multi Agent Path Finding Aug 2023 - Dec 2023
Carnegie Mellon University Pittsburgh, PA

- Reduced node expansions of constraint tree by **28%** for a **Multi Agent Path Finding (MAPF)** problem for a differential wheeled robot through an optimized variation of the **Conflict-Based Search Algorithm (CBS)**.
- Executed a **Lifelong MAPF** strategy, updating paths only for a subset of agents at a time, minimizing total number of calls to the CBS algorithm, resulting in a **37% reduction** in compute time for larger maps.

Environment Aware Payload Delivery Drone Aug 2023 - Dec 2023
Carnegie Mellon University Pittsburgh, PA

- Effectively deployed **ACADOS** solver for **NMPC** optimization, enabling aggressive and quick quadcopter manoeuvres.
- Generated flight trajectory using **RRT Planner** and **Motion Capture** allowing fast and collision free payload delivery.

Shipbot - Mechatronic Design Jan 2023 - May 2023
Carnegie Mellon University Pittsburgh, PA

- Programmed **Arduino** code for robot **motor control** on a rocking test bed, decreasing orientation fluctuations by **35%**.
- Developed different **localization and planning** algorithms including **EKF SLAM**, **Particle filter** and **Multi Goal A*** to be tested and integrated with base of a mobile robot while decreasing planning path cost by **20%**.
- Integrated** diverse subsystems (IMU, localization, computer vision, motor control) via **ROS**, reducing system latency.

LEADERSHIP

MechE MS Ambassador, Carnegie Mellon University Jan 2023 - Dec 2023

- Advised on **key policy changes** relating to academics and student mental health, improving **student welfare**.

Founder, Matak: Digital Solutions for Dance Academies during Covid-19 Lockdown Dec 2020 - Aug 2021

- Designed and deployed a **not-for-profit web application** to conduct online dance competitions receiving over **300k hits**.