AMAN CHULAWALA

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EDUCATION

Carnegie Mellon University **Aug 2022 – May 2024**
Master of Science in Mechanical Engineering | *Specialization – Robotics and Controls* | *GPA: 4.0/4.0* *Pittsburgh, PA*
Teaching Assistant: Numerical Methods (Spring 2023), Mechatronics (Fall 2023), Design and Fabrication (Spring 2024)
Relevant Coursework: Control Theory, Computer Vision, Planning and Decision Making, Reinforcement Learning

University of Mumbai **Aug 2018 – May 2022**
Bachelor of Mechanical Engineering | *GPA: 9.81/10.0* *Mumbai, India*
Relevant Coursework: Finite Element Analysis, Mechatronics, Metrology, Rapid Prototyping, CAD/CAM/CAE

EXPERIENCE

Robotics and Computer Vision Researcher **Oct 2022 – Present**
Carnegie Mellon University | *Dr. Kenji Shimada* *Pittsburgh, PA*
- Created a metrology pipeline with an **accuracy of 0.5 mm** to **measure quality of additively manufactured metal parts**.
- Leveraged **Proximal Policy Optimization** in Reinforcement Learning to solve Coverage Planning problems (IROS 2024).
- Utilized Sample Area Consensus with PointNet features for pose estimation, achieving **97% pose accuracy**.
- Using ray casting, developed a **reprojection metric** to quantity point cloud registration and overlap in real-time.
- Wrote **IK-Fast solver for a 7-DOF redundant robot system** to allow for faster solving of Travelling Salesman Problem.

Robotic Systems Engineer **May 2023 – Aug 2023**
Neocis | *R&D Team (System Integration Group)* | *Internship* *Miami, FL*
- Designed a testing station to **verify torque-current relation of actuators up to 50 N-m** using inline torque sensors.
- Wrote a testing pipeline to validate actuator performance under load with **maximum error of 15 arcseconds**.
- Created a torque loading mechanism which could **simulate torques up to 80 N-m** to replace a dynamometer.
- Supported development of an **end effector camera subsystem for self-calibration** procedures and guided motions.

PROJECTS

Mobile Platform for Environment Mapping and Survey **Oct 2023 – Mar 2024**
Individual Project | *Dr. Michael Kaess* | *Simultaneous Localization and Mapping* | Link
- Deployed a mobile platform for LiDAR based environment mapping using **ROS SLAM toolbox and Navigation stack**.
- Created a map survey routine using **Adaptive Monte Carlo Localisation** for structured environments.
- Implemented a **visual servo-based object tracking** routine for guided motion planning in the environment.

Assistive Robot for Operations on Cargo Ships **Jan 2023 – May 2023**
Group Project (Leidos) | *Dr. Cameron Riviere and Dr. Zeynep Temel* | *Mechatronics Design* | Website | Link
- Developed **eye-in-hand visual servo solution** for the manipulator to finetune task localization and execution.
- Deployed a **perception model based on YOLOv8 and Hough Transforms** for locating and analysing task state.
- Wrote **ROS Control and Telemetry package** for sequential data processing and controlled action execution.

Formula Student **Mar 2018 – May 2022**
DJS Racing | *Prof. Vinit Katira* | Website
- Aided in development of perception subsystem (segmentation) of an **autonomous electric formula student race car**.
- Led the **Business Plan team, securing a national rank of 4th and 2nd place** over a period of two years.

SKILLS

Software Frameworks: ROS, SolidWorks, Nvidia Isaac Sim, Gazebo, Blender, MATLAB, Simulink, ANSYS, Nvidia Jetson
Programming Languages: C++, Python, C, CMake, Java, Arduino
Tools and Libraries: CUDA, Linux Terminal, Git, Docker, AWS, OpenAI Gym, PyTorch, OpenCV, Open3D, NumPy, PCL
Industry: Data Bus and Ethernet Protocols, Rapid Prototyping, CNC Machining, PLC Programming