

Ashwin Nehete

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EDUCATION

Carnegie Mellon University

Master of Science in Mechanical Engineering - Research; GPA: 4.0/4.0

Pittsburgh, PA
August 2020 - Present

Courses: Computer Vision, Artificial Intelligence & ML, Robot Localization & Mapping, Planning & Decision Making in Robots

Indian Institute of Technology Kharagpur

Bachelor of Technology (Honors) in Manufacturing Science and Engg.; GPA: 8.61/10

Kharagpur, India
July 2016 - June 2020

SKILLS

Languages Python, C++

Software/OS ROS, MATLAB, ANSYS, COMSOL, AutodeskFusion, SOLIDWORKS

Libraries Numpy, OpenCV, Pandas, Tensorflow, Pytorch

GRADUATE RESEARCH

Computational Engineering and Robotics Lab

Research Assistant (Master's Thesis)

Pittsburgh, PA
September 2020 - Present

- o Conducting research for **Depowdering & Metrology for Additive Mfg. Post Processing** sponsored by NASA
- o Developing a model-based scan path plan for line laser scanner using over-segmented 3D point clouds
- o Currently working on motion planning for DENSO robotic arm and turntable for scanning of 3D objects
- o Attained scanned region visualization of an object rotating on a turntable as scanned by robotic arm in gazebo
- o Integrated linear stage actuator with ROS and arduino deploying MoveIt! and ROS Control

COURSE PROJECTS

Motion planning for Precise Scanning of 3D Printed Parts

Planning & Decision Making in Robots

- o Implemented PRM algorithm to develop a motion planner to traverse an ordered set of scan path waypoints
- o Currently working on planning for simultaneous motion of the DENSO robot and turntable for scanning

Lucas Kanade Template Tracking Optimization

Engineering Optimization

- o Evaluated the performance of Steepest Descent, Gauss-Newton, BFGS, Levenburg-Marquardt optimization methods on Lucas-Kanade template tracking in a video sequence

Comparative Analysis of SLAM Algorithms in ROS

Robot Localization & Mapping

- o Leveraged ROS to study visual-lidar SLAM methods; evaluated on benchmark datasets using pose error metrics
- o Analyzed performance of algorithms on outdoor data imported via ROS-Bridge from CARLA autonomous driving sim

Projecting Future Carbon Emissions with ML Classifiers

Artificial Intelligence & ML

- o Implemented several classifiers to model the effects of future changes in U.S. light-duty vehicles on carbon emission levels
- o Accomplished significant reduction in the execution time while maintaining 90% accuracy by using feature engineering

UNDERGRADUATE RESEARCH

Laser Material Processing Lab

Research Assistant (Bachelor's Thesis)

Kharagpur, India
August 2019 - June 2020

- o Aimed at modelling effects of powder deposition strategies on warping that occur during laser metal deposition process
- o Proposed a 2D model to predict the heat affected zone & residual stresses at the clad-substrate interface for 1st clad layer
- o The thesis titled **Thermo-Mechanical Modelling of Multi-track Laser Cladding** nominated for Best BTP Award

Autonomous Ground Vehicle Research Group

Mechanical Team Lead

Kharagpur, India
March 2017 - June 2020

- o Studied design elements to oversee structural analysis & simulation of sensor mounts for Mahindra Rise Prize Challenge
- o Designed CAD model on Solidworks and conducted structural analysis on ANSYS of Eklavya 6.0 chassis manufacturing
- o Significantly reduced mechanical vibrations induced in the chassis during its driverless run

WORK EXPERIENCE

Carnegie Mellon University

Teaching Assistant

Pittsburgh, PA
February 2021 - Present

- o 24787 : Artificial Intelligence and Machine Learning for Engineers | 24678 : Computer Vision for Engineers

William Control - Curtiss Wright

Summer Internship

Pune, India
May 2019 - July 2019

- o Reduced part rejection % by optimization of the automated inspection system for job assembly using image processing
- o Studied root cause analysis and comprehensive documentation of a complaint regarding abnormal accelerator pedal

PUBLICATION

- o Paper: A. Nehete, G. R. K. Kiran et al., *Design and Implementation of Autonomous Ground Vehicle for Constrained Environments*, 2019 Third IEEE International Conference on Robotic Computing (IRC), 2019, pp. 236-239, doi: 10.1109/IRC.2019.00043

HONORS AND AWARDS

- o Awarded the **MechE Summer 2021 Research Fellowship**, Carnegie Mellon University
- o Represented IIT Kharagpur at **IGVC (AutoNav Challenge) 2018**, Oakland University; secured podium position