Sayan Das

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EDUCATION

Worcester Polytechnic Institute (WPI)
Master of Science in Robotics Engineering — May 2023

Indian Institute of Technology Kharagpur (IIT KGP)
Dual Degree (BTech, MTech) in Mechanical Engineering, GPA 3.7/4.0 — July 2020

EXPERIENCE

Research Assistant, NITIE, Mumbai, India — Oct 2020 – June 2021

- Trained ML models (LSTM and LightGBM) to predict sales of brick-and-mortar retailers and optimized inventory levels as part of collaboration with o9 Solutions and Pradeep Metals Ltd respectively.
- Formulated vaccine allocation policies to minimize the scale of the pandemic by applying deep RL models (Proximal Policy Optimization) to the spatiotemporal COVID-19 vaccine allocation problem.

Intern, TU Dresden, Dresden, Germany — May – July 2019

- Implemented Trajectory Control of Hydraulic Excavator Bucket using sliding mode control.
- Established entire setup starting from sensor deployment and fusion to the development of a Graphic user interface (GUI) for real time visualization and control in Unity.

PROJECTS

Cooperative Path Planning for Automated Warehouse Management, WPI — Aug 2021 - present

- Implemented and benchmarked various multi agent cooperative path planning algorithms like Windowed Hierarchical Cooperative A*(WHCA*) and Local Repair A*(LRA*) on a 2D grid world.
- Integration of the planning algorithm with an automated warehouse environment in Gazebo.

Instance Segmentation, WPI — Aug 2021 - present

- Implemented Mask R-CNN using TensorFlow to detect and delineate different instances of multiple object classes in an image.
- Trained the model to segment instances of a custom object class.

Vision Based Control of Soft Robot, MER Lab, WPI — Aug 2021 - present

- Established visual tracking of robot orientation subsequently used as feedback for position control.
- Utilized sliding mode control in conjunction with an approximate Jacobian for controlling the robot.

Prognosis of Dynamic System, IIT KGP — Jan – April 2020

- Developed online algorithm using Particle Filter for parameter tracking of faulty components with unknown degradation models.

Modelling of Bionic Manipulator, IIT KGP — Jan – April 2019

- Modelling of a class of elephant trunk inspired pneumatically actuated continuum robots (CBHA).
- Variable curvature model used along with suitable enhancements to fit the bionic robot (Selected among the top projects of the year).

Formula SAE, TeamKART, IIT KGP — Sept 2015 – April 2018

- Analytically designed the suspension and steering geometry of a Formula Student racing car, the K4.
- Led the design and fabrication of aluminium hubs and the sway bar shock absorber actuation system.

SKILLS

Programming Languages: Python, C, C++, Java, C#, MATLAB
Software: ROS, Gazebo, Simulink, SolidWorks, Ansys, Unity

LEADERSHIP

Suspension and Brakes Team Head, TeamKART (Formula SAE), IIT KGP — May 2017 – April 2018

- Managed a team of 10 members towards the design and construction of the suspension and steering system of a Formula Student car.