

MIHEER DIWAN

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OBJECTIVE

Seeking summer internships in Robotics, Perception, and Machine Learning.

EDUCATION

Master of Science in Robotics Engineering, GPA- 4.0/4.0 Expected: May 2024

Worcester Polytechnic Institute (WPI), Worcester, MA.

Relevant Courses: Computer Vision, Machine Learning, Deep Learning, Project Management

Bachelor of Technology in Mechatronics with a Minor in Robotics & IoT, GPA- 3.46/4.0 May 2022

Mukesh Patel School of Technology Management & Engineering (MPSTME), NMIMS University, Mumbai, India.

Relevant Courses: Robotics System Design, Digital Signal & Image Processing, Mechatronics System Design.

SKILLS

Programming Languages & Tools: Python, MATLAB, OpenCV, PyTorch, ROS 2, Gazebo, C++

Software: Solidworks, Blender, AutoCAD, CoppeliaSim, Fusion 360, NI Multisim, Ansys Workbench, LaTeX.

PROJECTS

Einstein Vision (Tools: Blender, OpenCV, Python, Computer Vision, Deep Learning) April 2023

- Created a Visualization for an autonomous vehicle inspired by Tesla's Dashboard using Blender.
- Estimated relative depth of vehicles from 2D Monocular images using the Intel MiDaS model.
- Performed Lane Detection and Segmentation using classical computer vision and deep learning approaches.
- Detected and classified vehicles, pedestrians, traffic lights, and road signs using the YOLOv5 model.

Structure from Motion (SfM) (Tools: OpenCV, Python, Geometrical Computer Vision) March 2023

- Reconstructed the 3-D structure of WPI's Unity Hall from 2-D image correspondences.
- Estimated the Fundamental and Essential Matrix using Epipolar geometry constraints.
- Evaluated the 6 DOF camera poses and 3D world points using Perspective-n-Point (PnP) and refined them using Bundle Adjustment.

Camera Calibration (Tools: OpenCV, Python, MATLAB) Feb 2023

- Developed an automatic and robust camera calibration algorithm using Zhang's technique.
- Executed Non-linear optimization to approximate and fix image distortions.

Panorama Stitching (Tools: OpenCV, Python, MATLAB) Feb 2023

- Stitched images using feature matching, RANSAC, and Homography estimation.
- Stitched images using Supervised and Unsupervised deep learning approaches with the help of HomographyNet.

Smart Robotic Arm (Tools: Solidworks, OpenCV, Python, CoppeliaSim, MATLAB) Jun 2021 - Feb 2022

- Manufactured a bio-mimetic 6-DOF robotic arm with gesture-controlled and autonomous modes of operation.
- Simulated the robot in CoppeliaSim to track hand gestures in real-time and grasp objects with object detection.

Yaskawa Motoman MH5 Industrial Robot Dec 2021 - Feb 2022

- Executed trajectory generation and path planning for the six-axis industrial robotic manipulator to perform precise pick and place operations and draw custom logos on objects.

EXPERIENCE

Building Manager, Innovation Studio, WPI March 2023 - Present

- Working to provide students and engineers safe and easy access to the tools they need to realize their projects.

Research Intern, Technical Internship Program, MPSTME, Mumbai, India June 2021 - Nov 2021

- Built a closed-loop mathematical model for the sensorless control of BLDC motors based on Back-EMF control and zero-crossing detection using MATLAB/ Simscape.

Co-Head: Design & Simulation Department, Team Technotix, MPSTME 2019 - 2021

- Headed and trained a team of 15 people to develop two mobile robots: An arrow-Shooting robot and a Ball-Throwing robot for the ABU-Robocon 2020 and 2021 student robotics competition.
- Fabricated a custom swerve drive mechanism for the robots using Solidworks which drastically increased the speed of the robots.
- Secured **18th** and **11th** place finishes respectively out of 50 teams in the India National Finals with a **perfect score** in the Design phase of the competition.