

# Mayank Bansal

Worcester MA

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## OBJECTIVE:

Gain practical experience in ideating, developing and programming robots to improve quality of life for everyone.

## EDUCATION:

**Worcester Polytechnic Institute (WPI)**, Worcester, MA

Master of Science in Robotics, GPA 4.0/4.0

May 2024

**Manipal Institute of Technology, (MIT)**, Manipal, India

Bachelors of Technology in Mechatronics, GPA 8.71/10.0

June 2022

## COURSES:

Foundations of Robotics, Robot Dynamics, Legged Robotics, Motion Planning, Robot Control, Reinforcement Learning

## SKILLS:

**Programming Languages/ Operating System:** Windows, Ubuntu, OOP, Python, C++, C, Java, Embedded C

**Applications/ Software:** MATLAB, ROS, Solidworks, Arduino, Raspberry Pi, Google Colab, OpenCV, Gazebo

**Languages:** German, Hindi

## PROJECTS:

### Hexapod Walking Robot, WPI

October 2022 – December 2022

- 3D printed and assembled the body of the robot using PLA, Arduino Uno and SG90 servo motors.
- Developed the inverse kinematics for each leg to calculate joint angles from foot-tip positions in order to follow the desired foot trajectory.
- Collaborated with a team of four people to develop a tripod gait walking pattern for the robot and use rosserial to communicate between Arduino and the computer.

### Miniaturized Wheelchair Application of Triple Inverted Pendulum, MIT

June 2021 – August 2021

- Designed a triple-inverted pendulum system on a cart to study its use for creation of a wheelchair for the elderly and the injured.
- Developed the dynamic models of the system and visualized it using CAD on MATLAB and Simscape.
- Controlled the system using PID and LQR controllers to stabilize the motion of the links.
- Created a GUI on MATLAB for real-time visualization of the changes occurring in the system.

### Computer Vision for Autonomous Cars, MIT

April 2021 – May 2021

- Developed and trained a classification model on Tensorflow to classify different models of cars. The model achieved over 90% accuracy.
- Used YoLov3 object detection algorithm to create a model which can detect common road objects such as pedestrians, traffic lights, etc.
- Trained a U-Net based semantic segmentation model to distinguish between road-objects on a pixel level.

## EXPERIENCE:

### Computer Vision Intern, Wastefull Insights, Vadodara, Gujarat, India

January 2022 – May 2022

- Developed the training pipeline for waste detection on a conveyor belt using YoLOv5 object detection algorithm and deployed the model on Jetson Nano using TensorRT inference engine.
- Created and deployed a ResNet based colour classification model on NVIDIA Jetson Nano using TensorRT inference engine.
- Collected real-time images for waste detection and classification and annotated them to create the dataset.