

# Animesh Nema

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## Education

### Worcester Polytechnic Institute (WPI)

Worcester, MA

Master of Science in Robotics Engineering, GPA- 4/4

May 2019

**Related Courses:** Deep Learning, Computer Vision (Udacity Nanodegree), Robot Dynamics, Robot Controls, Motion Planning, Swarm Intelligence, Foundations of Robotics, Smart Materials

### Sri Ramaswamy Memorial University (SRM)

Tamil Nadu, India

Bachelor of Technology in Mechanical Engineering, CGPA- 3.71/4

May 2017

## Skills

**Programming Skills:** Python, MATLAB, C++, Buzz

**Software Skills:** PyTorch, TensorFlow, Keras, OpenCV, ROS, Catia, Latex, SolidWorks, Microsoft Office, Argos

## Work Experience

### Research Programmer

WPI (DARPA)

War fighter Analytics for smartphone healthcare

November 2018-Present

- Extracting and Analysing data from smartphone sensors to carry out real-time assessment of a war fighter.
- Developing machine learning/deep learning models to predict certain activities such as walking, sleeping etc and detect anomalies that could signal traumatic brain injuries.

## Projects

### Predicting Grade of Road for Autonomous Vehicles Using Supervised Deep Learning.

WPI

Deep Learning

September–December 2017

- Built a Convolutional Neural Network and trained it on a labeled dataset of IMU and GPS readings to predict the grade of the road ahead of the autonomous vehicle.
- Carried out video parsing, data filtering and data augmentation. Analyzed the performance of the model by observing the real-time video implementation of the results.

### Facial Key point Detection.

WPI

Computer Vision / Deep Learning

July 2018

- Designed an algorithm to detect 68 key points on a face (to identify features such as eyebrows, eyes, nose, lips and facial contour) by applying computer vision and deep learning techniques.
- Applied various transformations on the image dataset and developed a CNN using PyTorch.

### Adaptive trajectory Control of a Robotic arm subject to Varying Payloads.

WPI

Robot Controls

March 2018- April 2018

- Modelled an adaptive trajectory tracking controller on a 2-link Robotic arm to carry objects of unknown masses while maintaining its desired path.
- Modified the conventional approach, resulting in a simplified and much more efficient performance.

### Robotic Control of Surgical Laser Waveguide using ABB IRB120 Robot.

WPI

Robot Dynamics

February 2018- April 2018

- Performed dynamic modeling and control of the ABB IRB120 robot mounted with a laser waveguide, to follow certain trajectories and carry out tissue ablation. Developed a Python code for generating trajectories.
- Simulated using Gazebo and MoveIt.

### Automated Aerial Cinematography using an UAV.

WPI

Motion Planning

October 2018-December 2018

- Developed a motion planning algorithm to enable the quadcopter to autonomously traverse in an environment and capture scenes, while avoiding obstacles.
- Utilized ROS for communication and simulated using Gazebo.

### Solving Relocalization for SLAM using Vision.

WPI

Directed Research

September 2018-Present

- Carry out Relocalization in a previously mapped environment using Visual Slam based approach.
- Implement feature descriptor algorithms and compare the results with the database to identify a location in the environment.

### Three Finger Robotic Gripper with Tactile Sensors.

SRM

B.Tech Final Year Project

January–May 2017

- Modelled a 3-finger robotic gripper using SolidWorks and mounted the tip of the gripper with force resistive sensors to determine the appropriate minimum grasping force. Manufactured the parts via 3-D printing.
- Actuated all the fingers by a single servo motor, programmed using Arduino.