**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:** ROS , PyTorch, TensorFlow, Keras, OpenCV, Catia, scikit-learn, SolidWorks, Argos, Latex

**Work Experience**

**Research Programmer WPI (DARPA)**

War fighter Analytics for smartphone healthcare November 2018-March 2019

• 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**

# Visual Odometry based Relocalization using ORB feature descriptor WPI

Directed Research October 2018-April 2019

* Developed a computationally inexpensive relocalization module for a vision-only based system, using computer vision techniques and a single Kinect camera.
* Applied ORB feature descriptor to identify key points in a scene and find matches from the map.
* Performed perspective transformation on images to find the relative pose of the camera, for pose estimation.

**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.

**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.