

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.