Akshay Kumar

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EDUCATION

WORCESTER POLYTECHNIC INSTITUTE
MS IN ROBOTICS ENGINEERING
May 2019 | Worcester, MA
GPA: 3.93/4.0

MNIT JAIPUR
B TECH. IN ELECTRICAL ENGINEERING
May 2017 | Jaipur, India
GPA: 8.25/10

RELEVANT COURSES

GRADUATE
Robot Dynamics | Robot Control
Artificial Intelligence
Deep Learning for Advance Robot Perception
Deep Reinforcement Learning

UNDERGRADUATE
Control System Engineering
Modern Control Theory
Computer Architecture and Organisation
Modern Control Theory

INTERESTS

Robot Control | Manipulation
Motion Planning | SLAM
Mobile Robotics | Computer Vision

SKILLS

LANGUAGES
C++ | Python | MATLAB

SOFTWARES
ROS | V-REP
Gazebo | SolidWorks
Processing

LIBRARIES & PACKAGES
KDL | FCL | Conda
TensorFlow | MoveIt
NumPy | Keras
robot_pose _ekf | rosserial
Klamp't | OMPL
Ipopt | gmapping

HARDWARE
TurtleBot | Jetson Nano
Intel Galileo | Arduino
Raspberry Pi | Atmega 328/2560
NodeMCU | LiDAR
Intel RealSense D435i

EXPERIENCE

Robotics Software Developer- Modbot Inc. | July 2019-Present | San Francisco, US
- Developing kinesthetic teaching, collaborative safety and motion planning algorithms for modular robots using C++ & Python

Robotics Software Intern - Modbot Inc. | June 2018-April 2019 | San Francisco, US
- Developed dynamical models and control, planning, collision detection and performance enhancement algorithms for modular robots using C++ & Python

Robotics Intern - Swaayatt Robots Pvt. Ltd. | May-July 2016 | Bhopal, India
- Developed an AGV with a 6-DOF serial manipulator arm for indoor applications

SELECTED PROJECT WORK

CONTROL TECHNIQUES FOR SELF-DRIVING CAR
Dec 2019 - Present
- Model Predictive controller (using Ipopt optimizer) and PID controller implementation on the Udacity Car Simulator using C++

EKF BASED LOCALIZATION
Dec 2019
- Extended Kalman Filter based localization on the UTIAS dataset with and without landmark data association using Python.

VISUAL ODOMETRY ESTIMATION USING DEEP LEARNING URL
Aug 2018 - Dec 2018 | WPI | Mentor: Prof. Carlos Morato
- Vehicle pose estimation using Deep CNN + LSTM networks on the KITTI dataset

MANIPULATION OF 15 DOF SDA10F DUAL-ARM ROBOT URL
Aug 2017 - April 2018 | CIBR LAB - WPI | Mentor: Prof. Jane Li, Prof. Jie Fu
- Motion planning for each 7-DOF arm by generating multiple point trajectory (Used OMPL library and implemented simulation in ROS MoveIt)

FLC FOR INDOOR ROBOT NAVIGATION URL
Feb - May 2018 | WPI | Mentor: Prof. Jie Fu
- Implementation of Fuzzy Logic Controller for goal tracking and obstacle avoidance on TurtleBot2 using Kinect generated Point Cloud data

COLLABORATIVE TASK PLANNING USING REINFORCEMENT LEARNING URL
Aug 2017 - Dec 2017 | WPI | Mentor: Prof. Carlos Morato
- Simulating mid-air robot-robot object transfer on V-REP using Deep Q-Learning with Keras & Tensorflow

IMITATION LEARNING ON 5-DOF MANIPULATOR ARM URL
Feb - May 2018 | WPI
- Implementation of supervised & reinforcement learning based LfD techniques on 5-DOF Kuka YouBot manipulator arm in V-REP simulation environment

PUBLICATIONS

- Kumar, Akshay , et al. "Hardware in the loop based simulation of a robotic system with real time control and animation of working model" 2017 International Conference on Inventive Systems and Control (ICISC)", IEEE 2017. URL
- Kumar, Akshay , et al. "Joint Angle measurement for biped robot orientation estimation using MEMs based inertial sensors" Presented at 2nd IEEE International Conference on Electronics, Communication and Aerospace Technology (ICECA 2018) URL