

Akshay Kumar

<https://github.com/kumar-akshay324> | <http://kumarakshay324.github.io> | akumar5@wpi.edu | +1-508-615-3728

EDUCATION

WORCESTER POLYTECHNIC INSTITUTE

MS IN ROBOTICS ENGINEERING
Expected May 2019 | Worcester, MA
GPA: 4.0/4.0 (I Sem)

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

RELEVANT COURSES

GRADUATE

Robot Dynamics | Robot Control
Artificial Intelligence
Synergy of Human and Robot
Deep Reinforcement Learning
Foundations of Robotics

UNDERGRADUATE

Control System Engineering
Modern Control Theory
Computer Architecture and Organisation

INTERESTS

Motion Planning | Manipulation
Reinforcement Learning | Control Systems

SKILLS

LANGUAGES

Python | MATLAB
C++ | LATEX | Java

SOFTWARES

ROS (Indigo & Kinetic)
V-REP | SolidWorks
Processing

LIBRARIES & PACKAGES

TensorFlow | MoveIt
NumPy | Keras
OpenAI-gym | roserial
Klomp't | OMPL

HARDWARE

TurtleBot
Intel Galileo | Arduino
Raspberry Pi | Atmega 328/2560

SELECTED PROJECT WORK

MANIPULATION OF 15 DOF SDA10F DUAL-ARM ROBOT URL

Aug 2017 - Present | 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 using MoveIt)

FUZZY LOGIC CONTROLLER FOR ROBOT INDOOR NAVIGATION

Feb 2018- Present | WPI | Mentor: Prof. Jie Fu

- Implementation of FLC for goal tracking and obstacle avoidance on TurtleBot2 using Kinect generated Point Cloud data for exteroception

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

Feb 2018 - Present | WPI

- Implementation of supervised & reinforcement learning based LfD techniques on 5-DOF Kuka YouBot manipulator arm in V-REP simulation environment

LOWER BODY WALKING BIPED ROBOT URL

Aug 2016 - Apr 2017 | ZINE LAB - MNIT JAIPUR | Mentor: Dr. Rajesh Kumar

- Cubic Spline Interpolation based trajectory planning for the foot, knee and hip motion for a in-house developed 12-DOF servo actuated biped robot
- IMU sensor based joint angle prediction and estimation of the biped's orientation (Sensor Data Fusion using Kalman Filter)

SMART ANIMATRONIC HUMAN FACE URL

Jan - May 2017 | MNIT JAIPUR | Mentor: Dr. Rajesh Kumar

- Designed movement mechanisms and implemented interactive control (using computer vision and speech inputs) on an in-house developed animatronic head

ROBOTIC SETUP FOR POWER TRANSMISSION LINE MAINTENANCE URL

Mar - Apr 2015 | ZINE LAB - MNIT JAIPUR | Mentor: Dr. Rajesh Kumar

- HILS model implementation on Simulink-based live animation setup of a remotely functioning robot deployed on power transmission lines

EXPERIENCE | SWAAYATT ROBOTS PVT. LTD

Internship | May-July 2016 | Bhopal, India | Mentor: Sanjeev Sharma (Founder)

- Developed a mobile robot with a 6-DOF serial robotic manipulator arm with the ability to learn through kinesthetic teaching

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)