Akshay Kumar

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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
Synergy of Humans and Robot
Deep Reinforcement Learning
Foundations of Robotics

UNDERGRADUATE
Control System Engineering
Modern Control Theory & Design Techniques
Computer Architecture and Organisation

INTERESTS

Motion Planning | Manipulation
Reinforcement Learning | Control Systems

SKILLS

LANGUAGES
Proficient:
Python | MATLAB
Familiar:
C++ | LATEX | Java

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

LIBRARIES
TensorFlow | MoveIt
NumPy | Matplotlib
Scikit-learn |

HARDWARE
Intel Galileo | Arduino | AVR
Atmega Micro-controllers

SELECTED PROJECT WORK

MOTION PLANNING FOR 15 DOF SDA10F DUAL-ARM ROBOT
August 2017 - Ongoing | CIBR Lab - WPI | Mentor: Prof. Zhi 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)

COLLABORATIVE TASK PLANNING USING REINFORCEMENT LEARNING
August 2017 - Ongoing | WPI | Mentor: Prof. Carlos Morato

- Simulating mid-air robot-robot object transfer on V-REP using Deep RL

ROBOTIC SYSTEM TO AID REHABILITATION OF STROKE PATIENTS
August - December 2017 | WPI | Mentor: Prof. Zhi Jane Li

- Implemented Dynamic Movement Primitives from motion capture data to derive trajectories with temporal and spatial scaling for 2 3-DOF manipulators

LOWER BODY WALKING BIPED ROBOT
August 2016 - April 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
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
March – April 2015 | ZINE LAB - MNIT JAIPUR | Mentor: Dr. Rajesh Kumar

- Hardware in the loop based simulation and live animation setup of the remotely functioning system

EXPERIENCE | SWAAYATT ROBOTS PVT. LTD

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
- Designed the mechanisms and control system for automation of Accelerator, Clutch, Gear and Brakes of an existing SUV

PUBLICATIONS

- Kumar, Akshay , et al. **"Hardware in the loop based simulation of a robotic system with real time control and animation of working mode.l"** 2017 International Conference on Inventive Systems and Control (ICISC)". IEEE, 2017. URL

PATENTS

- Robotic Technology for Transmission Line Inspection in Live Condition – Patent Published URL
- Rail Alert Systems- Patent Published URL