Rishi Khajuriwala

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Objective: Seeking a Summer internship/Co-op in Robotics

Education

Worcester Polytechnic Institute (WPI), Worcester, MA
Master of Science in Robotics Engineering, GPA 4.00/4.00, May 2019

Gujarat Technological University (GTU), Ahmedabad, India
Bachelor of Engineering in Mechatronics Engineering, CGPA 7.28/10.00, June 2016

Skills

Python, MATLAB, ROS, GNU Octave, Vicon Motion Capture System(Mocap), SolidWorks, Arduino, PSPICE, MULTISIM, FANUC CNC Trainer, PLC,PROTEUS, LATEX, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Outlook.

Experience

Trainee Engineer, Chokshi Graphics, Ahmedabad, India, May 2016 – June 2017
- Designed Hydraulic Platform for easy loading and unloading of paper reels using SolidWorks.
- Integrated the Hydraulic system for the platform to lift weights up to 3 tons.
- Supervised the Prototyping of the platform.
- Integrated the Platform with the already available machines in the factory.

Projects

Directed Research, WPI, September 2017-Present
- Designed and Prototyped a low cost robotic system to aid in the rehabilitation of stroke patients in a team of 7.
- Developed the control system for the robotic arms in MATLAB.
- Developed an upper body template for the Vicon system.
- Used the generated motion patterns from Vicon system, applied DMP to the patterns.
- Debugged the hardware and software of the robot arms.
- Develop Motion AI for planning motion trajectories of the robotic arms.
- Develop new interactive games for the rehabilitation.

Artificial Intelligence, WPI, Jan 2018 – Present
- Implemented genetic and hill climbing algorithm to determine the optimum locations of industrial, residential and commercial locations in a city and implemented A* and hill climbing algorithm to solve N-Queens puzzle.
- Implemented Gibbs sampling algorithm to compute conditional probabilities for a Bayesian network, devised Kalman filter to keep track of a country's GDP and implemented Kalman filter to detect and eliminate anomalous Lidar data.
- Implemented Expectation Maximization Algorithm with random restarts that takes in N-dimensional data and finds the best number of clusters using Bayesian Information Criterion (Unsupervised Learning).
- Using Reinforcement Learning (SARSA algorithm) to solve a gridworld, where the agent has no model of environment.

Robot Controls, WPI, January 2017- Present
•Working as a team of two members to overcome dynamic friction changes and avoid obstacles in autonomous cars
• Formulate the dynamic model, devise an optimal cost function with constraints and perform online optimization
• Simulate the results using Gain-Scheduled Model Predictive Control design in MATLAB Toolbox
• Evaluate the real-life feasibility to use online MPC in complex rapidly changing environments

Robot Dynamics, WPI, September-December 2017
- Developed a dynamic Virtual World using RVIS and Gazebo in ROS, which can be used for simulating a real-world situation for Robot navigation.
- Applied A star algorithm in python and applied it to stimulate the turtle bot in the Gazebo virtual world.
- Learned various path planning algorithms.

Soft Robotics, WPI, March 2018- Present
- Developed a soft gripper.
- Developed Soft gripper using Pneu-nets using 3D printing and Lost wax technique.
- Surveyed all the soft manipulators and soft grippers available right now.
- Tested the gripper to grasped different daily used objects.

Final Year Project, GTU, June 2015-May 2016
- Designed and prototyped Semi-Automated Humanoid Robotic Limbs using SolidWorks.
- Used inverse pendulum and Zero Moment Point (ZMP) to overcome locomotion issue in biped robots.
- Designed and prototyped the lower limb exoskeleton of the humanoid by using artificial air muscles and developed in-house pneumatic air muscles to lower the cost of the air muscles by 70%.

Combat Robots, GTU, December 2013-May 2016
- Led a college team of 10 members to compete in "Robowars" events in national and international tournaments and in total won 12 awards for the College.
- Engineered robots of weights: 60 kg, 45 kg, 30 kg, 25 kg and 15 kg using Solid Works for Designing, Arduino, Solid state relays, etc.
- Designed a first-of-its-kind Single Piece Single Extrusion Snail Disk and Snail Drum to be used as weapon.

Independent Project, GTU, January-April 2013
- Developed a robot using arrays of IR sensors and controlled the robot to follow black line.
- Developed robot can be used for designing simple AGVs and various autonomous vehicles.
- Competed in the ISTE project exhibition and participated in Line Follower at Udaan-2013 at BVM

Leadership

Organizer, Robotics Project Club, GTU, April 2014- May 2016
- Organized and delivered various Workshops for high school and college students on Robotics Engineering.
- Advised and guided students to complete their technical projects by helping them debug problems they face with their projects.

Team Lead, Food Committee, Annual Function, GTU, February-April 2016
- Led a team of 25 people to manage the catering of the university annual function which was attended by 3000 students.
- Partnered with Security committee to systematize the entire security of the event.

Organizing Committee Head, ICIAME, GTU, February 2016
- Led a team of 40 students to host an international conclave attended by professors from international universities