Lakshay Gopalka

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Education

Worcester Polytechnic Institute (WPI), Worcester, MA *May 2021*
Master of Science in Robotics Engineering (GPA 4.0)
Relevant coursework: Robot Dynamics, Robot Control, Artificial Intelligence , Deep Learning, Optimal Control

SRM Institute of Science and Technology (SRM IST), Chennai, India *May 2019*
Bachelor of Technology in Mechatronics Engineering

Skills

Programming: HTML, C, C++, Python, MATLAB, Verilog, Tensorflow
Software/Hardware: SolidWorks, Ansys, Mission Planner, LabVIEW, FluidSIM, ROS, Gazebo, Rviz, MoveIt Pixhawk, MultiSim, Linux, PLC, Motion Capture system, Arduino, Git, LaserDesk

Experience

Software Intern, EnamelPure & Spatial Surgical, MA *Jun,20 - Present*
- Developing laser scan patterns and writing codes for testing specimens like bones, enamel for medical applications.
- Integrating and assessing the hardware with the software and evaluating its efficiency

Teaching Assistant, Electrical and Computer Engineering, WPI,Worcester, MA *Aug,2019 - Present*
- Coordinating with the professors to assist students with lab/coursework and grading exams/ homework.
- Providing hands on experience with MATLAB, Verilog, microcontrollers, amplifiers and various sensors.

Intern, ABB India Limited, Faridabad, India *June 2018*
- Researched the various configurations for IRB robot involved in the production of Induction Motors
- Investigated the efficiency of the production line and provided measures to improve plant performance

Intern, JCB India Limited, Ballabhgarh, India *Dec 2017*
- Assisted on assembly and main-frame line to understand the production process of Backhoe Excavators
- Performed testing operations to determine the load capacity and optimized process integration process

Projects

In-hand manipulation using 7-DOF arm and variable friction gripper, WPI *Dec 2019*
- Developing dexterous manipulation strategies using the gripper to grasp and rotate objects of variable friction
- Performing simulation in ROS using Franca arm to check the performance of the sliding, rotation tasks in task space

Iterative based learning controller for continuum snake robot *Aug,19 – May, 20*
- Implemented an iterative learning controller and PID controller on a modular pneumatic soft snake robot
- Designed anA* based adaptive motion planning algorithm for visualizing kinematic footprint of the robot
- Conducted experiments on the robot to validate the iterative controller superior performance over the PID

Generating human voice using Deep Learning, WPI, USA *Jan,20 – May,20*
- Constructing GAN and NN topology using Tensorflow framework to develop speech generation model
- Using text data and Tachotron model to input words for training and human metrics to asses the audio output

Dynamic step control for exoskeleton stair climbing, WPI, USA *Aug,19 - Dec,19*
- Developed a trajectory planner controller using Dynamic Motion Primitives (DMP) to assist human walking
- Investigated 10 human subject data obtained using motion capture to model dynamics and joint movement
- Successfully segmented PointCloud data and trained DMP for step planner trajectory up to 98% accuracy

Autonomous control & Implementation of Avionics in fixed-wing UAV, TKU, Taiwan *Jan,19 - April,19*

- Built autonomous controller and ground station in a team of 2 using Pixhawk module and MATLAB Simulink
- Analyzed and Installed the Avionics and Communication hardware component in the UAV
- Conducted several successful tests in SITL and HITL using X-Plane for Mission Planner & controller algorithm

Determine Attitude gauge reading in aircrafts using Computer Vision, TKU, Taiwan *Jan,19 - April,19*

- Selected as a researcher to work on commercial aircraft with Aviation Safety Council (ASC) of Taiwan
- Implemented Image Processing Toolbox in MATLAB to analyze and filter out raw image data successfully
- Developed an algorithm to determine the Attitude reading using pitch, banking angle up to 5% accuracy

Publication

Lakshay Gopalka, Ming Luo, Zhenyu Wan, Yinan Sun, Erik Skorina, Weijia Tao, Fuchen Chen, Hao Yang, & Cagdas D. Onal,**"Motion Planning and Iterative Learning Control of a Modular Soft Robotic Snake"**,IEEE Transactions on Robotics, 2020 *Under review*

Activities & Awards

Team member for IEEE, AAEES, Green Club *Aug, 19 - Present*
President for Social and Bhumi NGO Club, Chennai, India *Sep,17 - May,19*
Public Relation Manager for Society of Automobile Engineers (SAE), Chennai, India *June, 17- May, 19*
Performance based Scholarship for Undergraduate studies by SRM IST *2016-2018*