Devesh Bhura

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Education

Northwestern University   **Sep. 2021 – Dec. 2022**
Master of Science in Robotics   *GPA: 4.0*

University of Southern California   **Aug. 2017 – May 2021**
Bachelor of Science in Mechanical Engineering   *GPA: 3.57*

Experience

Autonomous Microrobotics Systems Lab, USC   **May 2020 – June 2021**
Undergraduate Research Assistant   *Los Angeles, CA*
- Implemented Filters and state estimation methods for Robotic Controllers, such as Kalman Filter, the Extended Kalman Filter, Multiplicative Extended Kalman Filter, RLS Algorithm Filter and LMS Algorithm Filter on MATLAB and SIMULINK
- Worked with robotic sensors such as VICON cameras and on board IMUs, gyroscopes and accelerometer

Center For Advanced Manufacturing, USC   **May 2019 – Dec 2019**
Undergraduate Research Assistant-Robotic Fish Project   *Los Angeles, CA*
- Researched and designed a fish robot capable of moving in 3 axes, using servo motors and replicating the Body-Caudal Fin propulsion system.
- Achieved active communication with the fish under 3 feet of water using a receiver and transmitter, and made the fish receive and follow commands, which made the fish turn around, and move it up and down in the water.
- Achieved stability of the fish and prevented the fish from rolling over, by managing uniform weight distribution, and achieved close to 90% buoyancy.

Projects

Control a Rolling Ball with a Robotic Arm and Computer Vision | *Python, ROS, OpenCV*   **November 2021**
- Developed a ROS package that controls a white board attached to the end effector of a 7 dof Franka-Emika Panda Arm and makes a ping pong ball follow trajectories drawn on the white board
- Implemented PD control on the position of the ball and the effort of robot joints
- Developed a maze solving algorithm which took a maze from the Realsense camera pipeline, solved the maze and gave the path to the control node which the ball would follow

YouBot Manipulation for picking and placing an object | *Python, CoppeliaSim*   **December 2021**
- Manipulated a 4 wheel mobile robot with 5 dof arm to pick up an object in CoppeliaSim
- Designed a feedforward PI controller to move the object with negligible error for different starting configurations
- Configured joint limits to prevent self-collisions and singularities while calculating the Inverse Kinematics for the robot

Modelling and control of rotational system | *MATLAB*   **January 2021**
- Evaluated time and frequency domain system identification methods for 1 dof and 2dof rotational systems
- Designed PD and PID controllers and evaluated their performance for 1 dof and 2 dof system, including for collocated and non-collocated control

3D-SLAM and Sensor Fusion on UGV | *C++, ROS*   **January 2022 - Ongoing**
- Implementing LOAM on Jackal UGV with sensor fusion techniques for improved performance

Technical Skills

Programming: Python, C++, C, MATLAB, Mathematica, LaTeX, SQL, Robotic Operating System, Linux, Git
Robotics: Gazebo, MoveIt, OpenCV, Control Systems, SLAM, Manipulation, Advanced Dynamics
Machine Learning: Regression, Naive Bayes, Neural Nets, Gradient Descent, Reinforcement Learning

Leadership / Extracurricular

Asli Baat A Cappella   **August 2017 – May 2021**
Captain (May 2018 – May 2019)   *USC, LA*
- Organized the first ever South Asian A Cappella Competition, MEHFIL, totalling around $ 15000, at USC as a qualifier round for a National level competition, with over 15 applicant teams and 6 entries from across the country.
- Demonstrated vision, focus, and imagination with arrangements and performance aspects of the team.