**Lamy Liu**

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# Working Experiences

**Embedded Software Engineer, Shanghai Fourier Intelligence Co. Ltd**

*Developed a medical-purpose skeleton robot which aims to help patients do* June.2017 – Dec.2017 *rehabilitation training*

* Designed CAD for mechanical components based on project requirements
* Programmed for microcontroller to send and receive CAN, I2C, and SPI message
* Developed state equations for accelerometer and design Kalman filter to obtain reliable sensor readings
* Design and tune PID controller for the servo motors on the robot, and implement the PID controller using Keil MDK
* Performed safety analysis and existing issues report for the embedded system and solve customer’s issues regarding to the embedded system

**Research Assistant in USC** Center **of Advance Manufacturing** May 15, 2018 - May 10, 2019

*Developed Motion Planning & Point Cloud software for 7 degree of freedom Kuka robot arm to accomplish surface polishing task*

* Developed an A\* algorithm to search for a collision free path in 3D space and used Jacobian Inverse to do the inverse kinematics for a 7 DOF robot arm
* Benchmarked the performance of the motion planning and the inverse kinematics algorithms, and recording the test results to SQL database
* Built software to get the interactive point cloud around the robot arm from Kinect depth camera, then integrated the point cloud with motion planning node in ROS, and visualized the whole surface polishing process in Rviz

# Professional & Research Experiences

**ASW28 Glider Modeling & Control Jan.2019 – May. 2019**

* Develop the state space equations and the models of aerosurfaces and propeller, which represents the external forces and moments on the 6 DOF rigid aircraft body.
* Design and tune a PID controller with 1st order actuator to control the total speed and yaw angle.
* Develop pure pursuit algorithm to follow a given desired path with an array of waypoints. The algorithm would adjust the lookahead distance according to velocity and curvature to reduce effects of oscillation and understeer.

**Self-Driving Vehicle Simulation** Jan.06 2019 – May 10, 2019 *Developed 6 degree of freedom vehicle dynamics model and complete a path following task*

* In Simulink, built a Center Control model for a 1/10 scaled RC car with steering and throttle control, aiming to follow a pre-computed path which consisting a series of waypoints.
* Implemented Magic Formula to compute the longitudinal and latitudinal tire force and used standard mass and damper system to represent suspension system, and adjusted the spring and damper constants
* Developed lane detection software with Spatial CNN which could simultaneously detect the lanes and compute the radius of curvature and offset from center of the lanes
* Compared the performance difference between PID and Model Predictive Control (MPC) algorithm, and implemented the MPC algorithm onto the car

**Skills**

* Professional Skills: C/C++, Python, SQL, Matlab, Machine Learning, ROS, QT, Simulink, Solidworks, Arduino

# Education

**University of Southern California (USC)** Jan, 2018 – May, 2019

* Major: Mechanical Engineering (Dynamics and Control) GPA:3.8
* Degree: Master of Science

**University of California Irvine (UCI)** Sep, 2013 – June, 2017

* Major: Mechanical Engineering GPA:3.7
* Degree: Bachelor of Science (Deans Honor List in 2015 Fall)