Justin Poh

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Education

Massachusetts Institute of Technology - Cambridge, MA February 2022 - Present
PhD Candidate, Department of Aeronautics and Astronautics (Course 16)

Massachusetts Institute of Technology - Cambridge, MA September 2020 - February 2022
Master of Science in Aeronautics and Astronautics, GPA: 5.0

Franklin W. Olin College of Engineering - Needham, MA September 2012 - May 2016
Bachelor of Science in Mechanical Engineering, GPA: 3.89
Recipient of 4-year, 50% Olin Merit Scholarship

Work Experience

Hyundai-Aptiv Autonomous Driving Joint Venture
Engineer III, Vehicle Systems Engineering | April 2020 - July 2020

- Performed requirements flow-down from product-level requirements to system-level requirements
- Performed high-level system decomposition
- Developed detailed physical architecture

Aptiv (Acquired nuTonomy in November 2017)
Engineer III, Vehicle Systems Engineering | October 2019 - April 2020
Engineer II, Vehicle Systems Engineering | January 2018 - October 2019
Autonomous Vehicle Engineer, Vehicle Engineering | August 2016 - December 2017

- Performed debugging of CAN and Ethernet networks
- Generated detailed requirements for vision system including camera control and triggering
- Partnered with cybersecurity team to determine component requirements to enable secure communications and secure updating of components
- Contributed to integration efforts with an OEM vehicle
- Generated system requirements for next generation autonomous vehicle platform
- Managed and contributed to design of internal diagnostic tool
- Designed failure mitigation/fail-over strategy for a subsystem

Locus Robotics
Mechanical Engineering Intern | June 2015 - August 2015

- Designed and built a docking solution for their warehouse robots
- Assembled and inspected prototype robots, generated detailed work instructions and provided feedback to mechanical engineering team on function, fit and finish

Research

Safety-Driven Architecture Development for Complex Systems September 2020 - January 2022

- Research performed as part of masters thesis
- Developed an alternative approach to architecture development that is top-down, safety-driven and does not rely on decomposition as the primary method for managing system complexity
- Integrates STPA at the beginning of the architecture development process so that safety-related information can be used to drive architecture development
- Applied the new approach to two aviation-related projects to demonstrate how the new approach can be used to develop architectures for real-world systems

Robust Robotics and Sensor Fusion Research for Ground Vehicles September 2015 - May 2016

- Helped to integrate ROS to modernize forebrain of John Deere XUV Vehicle
- Performed system integration and testing to enable drive-by-wire
- Re-designed operator panels to better allow human operator to monitor initialization as well as telemetry and sensor data
- Optimized FPGA code and added 2 additional motor controllers to sweep LiDARs
- Developed rudimentary RGBD sensor system to produce depth-registered images based on 2 actuated sweeping LiDAR units and front-facing camera

Tail Actuation of a Biomimetic Robotic Tuna June 2014 - May 2015

- Reviewed academic studies of biological tuna swimming motion
- Designed, 3D printed and tested prototype actuation system for robotic tuna capable of biomimetic locomotion

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Course Projects

The Great Tugboat Race, Fundamentals of Robotics Final Project November - December 2014

The goal of this project was to write LabVIEW code to control a tugboat to autonomously complete a series of timed tasks in the fastest time possible

FirefightingBot - Mechanical Design Final Project November - December 2014

Designed the track drive and suspension system for a firefighting robot capable of serving as a coworker to human firefighters. Produced design report including full assembly and drawing package.

Designing Bridges and Predicting Behavior - Mechanics of Solids and Structures April 2014

The project was to design and fabricate 2 bridges and use Solidworks to predict their buckling behavior. The first bridge was built with dry spaghetti and the second was built with tongue depressors.

Volunteer Physicians - User Oriented Collaborative Design January 2014 - April 2014

Worked in a team of four to design an intelligent note taker for volunteer physicians to help doctors keep track of the patient's history during a consultation.

Airfoil Flutter (Final Project for Dynamics Course) November 2013 - December 2013

Conducted research into different aerodynamic model implementations and their effect on the accuracy of simulation of airfoil flutter

Principles of Engineering - Dominobot September 2013 - December 2013

Designed a robot controller using a web camera and OpenCV to follow a laser light to lay a domino trail

Real World Measurements - Chameleon Cube April 2013 - May 2013

Designed an entirely analogue circuit for an LED cube that detects the color below the cube replicates it on LEDs on the top

Leadership Experience

Ground Vehicle Program Lead, Olin Intelligent Vehicles Laboratory September 2015 - May 2016
Led a team of 4 students to develop the LabVIEW-based vehicle controller, sensor fusion system and ROS-based forebrain for a John Deere XUV vehicle.

Drivetrain Subteam Lead, Phoenix Racing April 2013 - May 2014
Led a team of 8 students to design and improve the drivetrain for an off-road racing vehicle

Transport Supervisor, Singapore Armed Forces February 2010 - December 2011
Responsible for managing and planning the deployment of 80 vehicles and 40 drivers to support training

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Skills

Machine Shop: Belt Sander, Drill Press, Band Saw, Paint Booth, Basic Composites, Manual Mill
Software: Solidworks, Matlab, Enterprise Architect, Polarion, Vector CANalyzer, PEAK PCANView
Programming & Modeling Languages: NI LabVIEW, Latex, Python, C++, ROS, SysML
Language: Conversant in Chinese