Peter Johnson

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EDUCATION

HARVEY MUDD COLLEGE
B.S., with Distinction, Engineering
May 2020 | Claremont, CA
Major GPA: 3.61/4.0

PEKING UNIVERSITY
Summer Study Abroad
Summer 2018 | Beijing, China
Program focused in Electrical Engineering

UNIVERSITY OF TORONTO
Self-Driving Cars Specialization
Summer 2020 | South Hadley, MA
Currently enrolled in Coursera program

COURSEWORK

State Estimation
Robotics with ROS
Microprocessor Sys Design & App
Optimal Control
Adv Systems Engineering II (Controls)
Adv Systems Engineering I (Signals)
Digital Logic and Computer Eng
Data Structures/Program Dev
Machine Learning for Engineers
Algorithmic Trading
Analog Circuits & Devices

SKILLS

ENGINEERING AREAS
Kalman Filter • Particle Filter • Baye's Filter • Classic & Modern Control • Path Planning • Embedded Systems • Signal Processing • Digital Logic Design

TOOLS & SOFTWARE
ROS • QuartusPrime • ModelSim
CANalyzer • Oscilloscope • Multimeter
SIMULINK •LabVIEW • Machine Shop

PROGRAMMING & HDL
C • C++ • Python • SystemVerilog
MATLAB • Assembly

AWARDS

2016-2020 Dean's List (Each semester)
2016 Hispanic Scholarship Fund Scholar
2016 National Merit Scholar
2016 Valedictorian
2015 Eagle Scout

WORK EXPERIENCE

DOOSAN BOBCAT | Clinic Engineer
September 2019 – April 2020 | Claremont, CA | Team of 5
I modeled system dynamics of a track loader and implemented a P-Controller in python to interface with machine CAN bus for path following. Modified A* algorithm's path for controller integration. Development work in radar mapping with PCL

DOOSAN BOBCAT | Robotics Engineering Intern
May 2019 – August 2019 | Bismarck, ND | Team of 2
Converted Bobcat loader into autonomous system with Python and ROS stack. Integrated sensors and controller with embedded Linux board via CAN bus and Arduino serial. Demoed radar and LiDAR object detection and visualization.

TECHMATION | Clinic Engineer
September 2018 – December 2018 | Claremont, CA | Team of 5
Characterized a high frequency radar for object detection applications. Team lead on waveform signal processing simulation in MATLAB. Analyzed demos of DBSCAN clustering and Kalman Filtering for the team to implement.

HARVEY MUDD COLLEGE | Tutor/Grader
Sept 2017 – Present | Claremont, CA
Tutor/Grader for Digital Electronics and Computer Architecture, Principles of Computer Science, Data Structures, Engineering Systems and Linear Algebra

UNDERGRADUATE PROJECTS

UNSCENTED KALMAN FILTER LOCALIZATION | Team of 2
April-May 2020 | Claremont, CA
Used encoder and LiDAR data along with an occupancy grid map to estimate the pose of a robot traveling in an underground mine. Developed correction step using beam casting for a subset of LiDAR measurements. Implemented the filter in Python.

EXTENDED KALMAN FILTER & PARTICLE FILTER | Team of 2
February-March 2020 | Claremont, CA
Used IMU and LiDAR data to localize a robot traveling in a square path. Given a known landmark, developed the motion and measurement models and implemented the filters in Python. Achieved RMSE path crosstrack errors of 0.281 m and 0.204 m.

MPC FOR PATH TRACKING | Team of 2
December 2019 | Claremont, CA
Developed kinematics of bicycle model vehicle. Implemented Model Predictive Controller in MATLAB to minimize trajectory crosstrack error with additional weights on actuation and constraints for smoothness of path.

AUTONOMOUS MOBILE ROBOT | Team of 2
February 2019 – May 2019 | Claremont, CA
For a differential drive robot, implemented odometry and P-control using encoders, point tracking, and RRT path planning nodes in python with ROS message passing. Achieved cm accuracy when navigating a maze given a map and a goal pose.

DIGITAL CONTROLLERS | Team of 2
April 2019 | Claremont, CA
Designed analytically, simulated in SIMULINK and experimentally tested digital PI controllers for an overdamped second order LTI system. Compared results and ease of implementing modern and optimal control techniques on an Arduino Uno.