Jacob Donenfeld

B.S. in Computer Science and Mathematics
Harvey Mudd College: 2017-2021
GPA: 3.557

Email: jdonenfeld@g.hmc.edu
Phone: +1(310) 779-8534

I am a high performing senior studying computer science and mathematics at Harvey Mudd College. I am interested in robotics, specifically multirobot path planning, state estimation, and machine learning. I have diligently taken engineering courses on top of my regular workload throughout every semester of college in order to obtain a well rounded education focused on robotics.

Relevant Courses

Robot Path Planning	Computer Systems	Principles of Computer Science	Digital Electronics & Computer Engineering
Robot State Estimation	Stochastic Processes	CS Clinic with Tradeweb	Advanced Systems Engineering 1 & 2
Algorithms	Programming Languages	Machine Learning at Berkeley	Robotics: Aerial Robotics at UPenn
Data Structures	Engineering Systems	Computer Networking at Stanford	Advanced Problems in Engineering

Programming Languages

C++, C, Go, Java, Python, Matlab, Verilog, Prolog, Haskell, Assembly, Racket.

Skills

Robotics, ROS, Blockchain, Networking, Motion/Path Planning, Control Systems, openAI, pyBullet, pyTorch, tensorflow, Gazebo, libp2p, CAD/CAM, CNC, FEA, Solidworks, Embedded Systems, Manufacturing, Prototyping, Adobe, LaTex.

Publications in Progress

Intelligent Air Quality Sampling via Mobile Sensor Networks — Harvey Mudd, Estimated April 2021

Experience

Clinic Program with Tradeweb — Harvey Mudd, 2020-Present
Harvey Mudd major capstone where I work on a small team for Tradeweb to develop a neural network to predict and notify when their trading servers might approach high latency, causing system failure if not caught early enough. I develop, train, and test a time-series data neural network and meet weekly with Tradeweb.

Research in the Lab for Autonomous Networks Research Group — USC, 2019
Summer REU applying blockchain and distributed systems to multi robots. Proposed a partition tolerant distributed ledger for swarm data consensus and task coordination through peer to peer networking, impervious to network reshaping, byzantine faults, and fail-stop faults.

Research in the Lab for Autonomous Intelligent Vehicles — Harvey Mudd, 2018-Present
Planned an optimal driving path to maximize information gain for a pollution sensor, mapping pollution in a 4D graph of position per pollution over time. Created a novel real time filtering and planning system used on a car.

Robotics Instructor — Rolling Robots, 2016-2017
Taught elementary school students how to code in Python and Scratch, design models, print models with a 3D printer, and general teamwork skills.

Awards

Winner, HackTech Hackathon — Caltech, 2018
Won a grant and mentorship from 1517 fund for building a smart trigger lock for a nerf gun.

Finalist, Muddhacks Hackathon — Harvey Mudd, 2018
Built an automatic drink dispenser and mixer. Handled software and electronics integration.

4^{th} Place, FIRST Robotics International Competition — Texas, 2017
Developed autonomous control of the robot with Java and OpenCV.

Selected Projects

EKF vs UKF Comparison for Autonomous Car Localization in an Urban Environment — 2020
Worked in a team of three that implemented an EKF and UKF to compare their predictions to truth and to each other to see which handles best in an urban environment with a gps of varying accuracy. Used two types of genetic algorithms to hone the UKF parameters. Used the KAIST Urban Dataset.

Autonomous Robot — 2019-2020
Taught myself ROS, sensor fusion with an EKF, v-slam, simulations through Gazebo, kinematics for differential drive robot, and sensor integration/implementation to build a autonomous shopping cart.

Electric Skateboard — 2017-2018
Taught myself SMD soldering, circuit board design, CNC milling, carbon fiber composite making, FEA stress analysis, and battery construction to build an electric skateboard.