Milo Knowles

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https://github.com/miloknowles

WORK EXPERIENCE

Skydio, Redwood City CA - *Autonomy Software Intern*
June 2019 - August 2019

Implemented autonomy features in C++ and Python for exploring, mapping, and imaging buildings. Built a web application using Three.js for overlaying aerial imagery on the 3D structures.

AdaViv, Cambridge MA - *Robotics Intern*

January 2018 - March 2018

Implemented a visual odometry pipeline in C++ for estimating the trajectory of a camera in a greenhouse and stitching together overhead imagery.

Optimus Ride, Boston MA — *Perception Software Intern*

June 2018 - August 2018

Implemented computer vision software in C++ to auto-generate maps from LiDAR, point cloud, and camera data.

Kespry, Menlo Park CA — *Software Engineering Intern*

May 2017 - August 2017

Built a web application using Node.js and PostreSQL for annotating training data for deep learning models.

Robust Robotics Lab, CSAIL — *Research Assistant*

August 2016 - Present 2020

Monocular visual odometry, descriptor-based data association, and uncertainty learning and online adaptation for deep stereo depth estimation.

EDUCATION

Massachusetts Institute of Technology (2015-2019)

B.S Computer Science (6-3) - 4.8 GPA

Massachusetts Institute of Technology (2019-2020)

M.Eng Computer Science - 5.0 GPA

PROJECTS

6.141: Robotics Science and Systems
Wrote perception, planning, and control software for an autonomous racecar using C++, Python, and ROS. Algorithmic work included Monte Carlo localization, lane following, RRT*, Closed-Loop RRT, Motion Primitive Planning, and a pure pursuit controller.

LANGUAGES & FRAMEWORKS

Languages: C++, Python, C#, MATLAB, Javascript, R, Bash, Halide

Robotics: ROS, OpenCV, PCL, LCM,

Machine Learning: PyTorch, Keras

Web: Node.js, React.js, PostgreSQL, HTML, CSS

CLASSES

Computational Biology
-Biomolecular Feedback Systems
-Computational Biology: Genomes, Networks, Evolution

Robotics and Machine Learning
-Robotic Manipulation
-Advances in Computer Vision
-Robotics: Science and Systems
-Principles of Autonomy and Decision Making
-Computational Photography
-Applied Machine Learning
-Mobile Autonomous Systems Lab (MASLAB)

Computer Science
-Computer System Design
-Design and Analysis of Algorithms
-Introduction to Algorithms
-Computation Structures
-Video Game Design
-Computer Music

Math and Science
-Algorithms for Inference
-Optimization for Machine Learning
-Linear Algebra
-Differential Equations
-Introduction to Inference
-Physics I & II
-Calculus I & II
-Signals and Systems
-Introduction to Astronomy

MIT Mobile Autonomous Systems Lab 2017 — *1st Place*

Designed, built, and programmed an autonomous robot to navigate through an unknown environment, collect, sort, and stack blocks. Used ROS and OpenCV with nodes in Python and C++.

MIT Pokerbots Competition (January 2020)

Implemented a particle filter and counterfactual regret minimization algorithm to train an agent to play “Permutation Hold’em”.

6.881 Class Project (Spring 2020): A Lagrange Dual Learning Framework for Solving Constrained Inverse Kinematics Tasks

Trained a neural network to produce fast, approximate solutions to inverse kinematics problems with physical constraints such as joint limits and workspace obstacles.

6.557 Class Project (Spring 2020): Designing a Feed-Forward Genetic Circuit for a Temperature-Robust Toggle Switch

Designed a circuit that uses a temperature-controlled protease to make a genetic toggle switch robust to temperature changes.

6.047 Class Project (Fall 2019): Identifying cell-specific epigenetic biomarkers for improved food allergy diagnostic testing

Used cell-type deconvolution to identify CpG locations that are differentially-methylated between control and allergic individuals. Compared the performance of predictive models for food allergy based on these epigenetic biomarkers.