MILO KNOWLES

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WORK EXPERIENCE

Blue Meadow (Cambridge, MA) — *CEO & Founder*
September 2020 - December 2021

Initially developed an IoT monitoring system for seaweed farms, and later pivoted to a carbon crediting platform for coastal restoration projects. Accepted into SeaAhead's BlueSwell accelerator. Gained experience with pitching, customer interviews, market research, hardware prototyping, and grant writing.

MIT Robust Robotics Lab (Cambridge, MA) — *Research Assistant*
August 2016 - September 2020

My masters thesis focused on uncertainty learning and online adaptation for deep stereo depth estimation. As an undergraduate, I worked on projects in monocular visual odometry.

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

Built an early prototype of Skydio's 3D Scan software. Worked on autonomy software for exploring and mapping structures and a web application for overlaying aerial imagery on the structure.

AdaViv (Cambridge, MA) — *Robotics Intern*
January 2018 - March 2018

Implemented a visual odometry pipeline 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 mapping software and a Qt application for auto-generating street maps from LiDAR.

Kespry (Menlo Park, CA) — *Software Engineering Intern*
May 2017 - August 2017

Built a web app to streamline training data annotation for deep learning models.

EDUCATION

Massachusetts Institute of Technology (2019 - 2020)

M.Eng Computer Science (AI) - 5.0 GPA

Massachusetts Institute of Technology (2015 - 2019)

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

PUBLICATIONS

M. Knowles, V. Peretroukhin, W.N. Greene, and N. Roy, "Toward Robust and Efficient Online Adaptation for Deep Stereo Depth Estimation," in *International Conference on Robotics and Automation (ICRA)*, 2021. Available: http://groups.csail.mit.edu/rrg/papers/knowles-icra21.pdf.

SOFTWARE EXPERIENCE

Languages: C++, Python, C#, Javascript, R, MATLAB, CUDA

Robotics: ROS, OpenCV, LCM, Unity3D

ML: PyTorch

Web: React.js, Node.js, Flask, HTML, CSS, Bootstrap, SQL, Three.js

SELECTED COURSEWORK

Robotics and Machine Learning
*Robotic Manipulation
*Advances in Computer Vision
*Robotics: Science and Systems
*Principles of Autonomy and Decision Making
*Computational Photography
*Applied ML
*Optimization for ML

Computational Biology
*Biomolecular Feedback Systems
*Intro to Computational Biology

Computer Science
*Algorithms for Inference
*Computer System Design
*Design and Analysis of Algorithms
*Introduction to Algorithms
*Computation Structures
*Video Game Design
*Computer Music
*MIT Pokerbots

Math and Science
*Linear Algebra
*Differential Equations
*Introduction to Inference
*Physics I & II
*Calculus I & II
*Signals and Systems
*Thermodynamics & Fluids
*Introduction to Astronomy

SELECTED PROJECTS

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.

6.141: Robotics Science and Systems (Spring 2018)
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.

MIT Mobile Autonomous Systems Lab (Winter 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++.