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 environmental restoration projects. Accepted into SeaAhead's BlueSwell accelerator. Gained experience with pitching, customer interviews, 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 (C++ / Python) for exploring and mapping structures and a web application (Three.js) for overlaying aerial imagery on the structure.

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

Implemented a visual odometry pipeline (C++ / Python) 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 (C++) to auto-generate 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 - 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, HTML, CSS, Bootstrap, SQL

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

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++.