# ADHAM ELARABAWY

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## EDUCATION

**University of California, Berkeley**

***Electrical Engineering & Computer Science - Regents Scholar*** Expected Graduation: 2023

- *Relevant Courses:* CS61A/B (Data Structures, Algorithms), CS188 (Artificial Intelligence), CS170 (Algorithms), CS70 (Discrete Math, Probability Theory), EECS16A/B (Machine Learning, Robotics) , MATH53 (Multivariable Calculus)
- GPA: 3.96

## EXPERIENCE

**FORMLABS** *3D Printing Technology Developer & Manufacturer* Boston, MA

***Software Engineering Intern*** **(Python, Go, C++)** Sept 2020 - Present

- Developed real-time jerk-limited trajectory generation algorithm driven by material science and laser optics constraints resulting in 17% print time savings & 9% reduced activeprinter sound.
- Optimized cured resin peel procedure via integrating force sensor feedback for higher resolution parts leading to 8% less force on printed parts.
- Enhanced control systems and motion planning for Formlabs FLS/SLA 3D-printers.

**MACHYNA LABS** *Computer Vision & Machine Learning Startup* San Diego, CA

***Co-Founder (9% Equity) / Software Engineer*** **(Python, C++, Unix Scripting)** June 2021 - Present

- Formulated 3 millisecond barcode detection pipeline using HSV thresholding preprocessing into a heavily optimized convolutional neural network with 94% accuracy with EAN-13 & UPC-A barcodes.
- Engineered OpenNMT-based machine learning language model to translate barcode images into corresponding product codes with 95% effectiveness.

**KELZAL** *Low-Power Computer Vision & Machine Learning Startup* San Diego, CA

***Software Engineering Intern*** **(Python, UNIX Script)** June 2019 - Aug 2020

- Devised neural network architecture for real-time battery-powered shopping carts for automated 24-class grocery product classification with 89% accuracy.
- Architected an entirely automated pipeline for generating a synthetic training corpus augmented with various symmetric and asymmetric signal transformations.

**GROGURU** *Strategic Irrigation through AI Startup* San Diego, CA

***Software Engineering Intern*** **(Java, JavaScript, MySQL, JSP, HTML/CSS)** June 2017 - Aug 2019

- Automated sensor placement via machine learning using NDVI composites computed from multispectral satellite imagery.
- Created full-stack web application for monitoring 200+ sensor suites on remote industrial farms.

## EXTRACURRICULAR

**OPEN-QUADRUPED** *Featured and Cited in Northwestern Research Paper (IEEE)* San Diego, CA

***Personal Robotic Dog Project*** **(Python, C++, ROS)** May 2020 - Present

- Conceptualized and 3D-printed robot dog parts from scratch via FDM/SLS printing.
- Pioneered reinforcement learning on open-loop gait using IMU sensor for real-time balancing (in Gazebo Physics Engine)
- Deployed object classification and tracking via YOLOv3 neural network trained on custom dataset
- Implemented 3D environment localization and mapping using Visual ORB-SLAM + LIDAR.

**MACHINE LEARNING @ BERKELEY** *Machine Learning Organization @ UC Berkeley* Berkeley, CA

***Researcher + External Relations Officer*** **(Python, PyTorch, Keras)** Feb 2020 - Present

- Conducted active machine learning research using autoencoders as an image compression technique in an effort to outperform existing compression methods with 3% improved signal-to-noise reconstruction performance.

## PATENTS & AWARDS

- **Provisional Patent Inventor - Improved Elevated Robotic System & Method** (Reg.#62959086): Conceived control system for assistive robotic vehicle that traverses a metal rail. Current applications: tracking an intruder around a house, optimized networking through router placement, educational platform for introducing computer vision.
- **2020 U.S. Presidential Scholar Candidate:** One of 4500 U.S. high school students selected.
- **2019 First Place in the Computer Science Division:** 65th Annual Greater San Diego Science and Engineering Fair.
- **2018 First Robotics Competition World Championship Division Finalist:** placed 7th in the FRC World Championship.