ADHAM ELARABAWY

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EDUCATION

University of California, Berkeley
Electrical Engineering & Computer Science - Regents Scholar Expected Graduation: 2024

- *Relevant Courses:* CS61A/B (Data Structures, Algorithms), EECS16A/B (Circuit Analysis/Design, Machine Learning, Robotics, Control), CS70 (Discrete Math, Probability Theory), MATH53 (Multivariable Calculus)

EXPERIENCE

FORMLABS *3D Printing Technology Developer & Manufacturer* Boston, MA
***Software Engineering Intern* (Python, Go)** Sept 20 - Present

- Developed real-time jerk-limited trajectory generation algorithm driven by material science and laser optics constraints.
- Optimized cured resin peel procedure via integrating force sensor feedback for higher resolution parts.
- Enhancing control systems and motion planning for Formlabs FLS/SLA 3D-printers.

OPEN-QUADRUPED *Featured and Cited in Northwestern Research Paper (IEEE)* San Diego, CA
***Personal Robotic Dog Project* (Python, C++, ROS)** May 20 - Present

- Designed and 3D-printed robot dog parts from scratch via FDM/SLS printing.
- Developed 12-point modular bezier foot trajectory with intuitive tuning parameters.
- Simulated reinforcement learning on open-loop gait using IMU sensor for dynamic 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.

KELZAL *Low-Power Computer Vision & Machine Learning Startup* San Diego, CA
***Software Engineering Intern* (Python, UNIX Script)** June 19 - Aug 20

- Adapted convolutional neural networks for object detection of event-based infrared sensors.
- Designed neural networks with the YOLO object detection architecture for proprietary object classification pipeline.
- Optimized neural network architecture for real-time on battery-powered shopping carts for automated grocery detection.

HIBOTICS *Compact Robot on Rails Platform Startup* San Diego, CA
***Software Engineering Intern* (Python, C++, ROS)** Sept 19 - June 20

- Developed computer vision system, control system, and electrical foundation of Elevated Robotics Assistive Device.
- Implemented hand gesture recognition based on CMU hand pose reconstruction neural network.

GROGURU *Strategic Irrigation through AI Startup* San Diego, CA
***Software Engineering Intern* (Java, JavaScript, MySQL, JSP, HTML/CSS)** June 17 - Aug 19

- Built system for optimized sensor placement through the use of NDVI composites from multispectral satellite imagery.
- Developed management web application for monitoring 200+ sensors deployed on remote industrial farms.

PATENTS & AWARDS

- **Provisional Patent Inventor - Improved Elevated Robotic System & Method** (Reg.#62959086): Developed control system for assistive robotic vehicle that traverses a metal rail. Current applications: tracking an intruder around a house, optimized networking through dynamic 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.

EXTRACURRICULARS

FIRST ROBOTICS (3128) *International High School Robotics Competition* Canyon Crest Academy
***Head of Controls & Lead Programmer* (Python, Java)** Aug 17 - June 20

- Implemented State Space Controller for elevator, fourbar, and drivetrain system.
- Developed Computer Vision System using HSV thresholding and solvePnP for real-time automatic alignment.
- Created quintic spline trajectory generation for drivetrain path generation & deployed Ramsete algorithm for path pursuit.