

# ADHAM ELARABAWY

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## EDUCATION

### University of California, Berkeley

Electrical Engineering & Computer Science - Regents Scholar

Expected Graduation: 2024

- Relevant Courses: CS61A, CS61B, CS61C, CS188, CS189, CS127, CS170, CS70, EECS16A, EECS16B, Math53.
- Data Structures, Algorithms, Artificial Intelligence, Machine Learning, Optimization, Discrete Math, Probability Theory, Information Theory, Robotics, Multivariable Calculus.
- GPA: 3.9

## EXPERIENCE

### SCALE AI Artificial Intelligence Startup

San Francisco, CA

Machine Learning Research Engineer Intern (Python, PyTorch, Kubernetes, Docker, Celery, AWS)

May 2022 - Present (9 mo.)

- Currently @ Special Projects Team; leading active research in identity-preserving context/scene/product enrichment using novel generative diffusion models. Architected Scale AI Forge product from inception. Training + fine-tuning large models.
- Prev. @ Synthetic ML Team; research in selective style-transfer & unpaired image-to-image translation using Diffusion Models, CLIP, and CycleGANs for decreasing sim-to-real gap in hybrid-synthetic 2D + 3D models.
- Interned 3X. CVPR 2023 preprint submission.

### GOOGLE Information Technology

Mountain View, CA

Machine Learning + Software Engineering Intern (Python, C++)

Feb 2022 - May 2022

- Developed ML model for website description selection as part of Google Search, maintaining 99.5% precision and improving URL coverage by > 27% compared to previous hand-tuned algorithm.

### UC Berkeley Research Lab Prof. Miki Lustig MRI ML Research Lab @ UC Berkeley

Berkeley, CA

Undergraduate Researcher (Python, PyTorch, Keras)

Aug 2021 - Present

- Architected a complex-valued Convolutional Neural Network Plug-and-Play denoiser in PyTorch targeted for solving the (2D + Time) inverse MRI problem in a deep unrolled MoDL architecture.
- Advised by Professor. Miki Lustig, Dr. Efrat Shimron, & PhD Student Alfredo De Goyeneche Macaya.

### FORMLABS 3D Printing Unicorn Company

Boston, MA

Software Engineering Intern (Python, Go, C++)

Sept 2020 - Dec 21

- Developed real-time jerk-limited trajectory generation algorithm driven by material and laser optics constraints.
- Enhanced control systems and motion planning for Formlabs FLS/SLA 3D-printers.

## PUBLICATIONS + EXTRACURRICULAR

'Direct Inversion' Optimization-Free Text-Driven Real Image Editing with Diffusion Models

San Diego, CA

First Author Preprint | Github Repo (Python, Diffusion Models, Generative ML)

Aug 2022 - Present

- Abridged Abstract: Using widely-available generic pre-trained text-to-image diffusion models, we demonstrate the ability to modulate pose, scene, background, style, color, and even racial identity in an extremely flexible manner through a single target text detailing the desired edit.
- Currently under 2023 major conference review.

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 3D-printing.
- Pioneered reinforcement learning on gait using IMU sensor for real-time balancing (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.