Elias Oliver Chang

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Education

UC Santa Cruz — Santa Cruz, CA
Ph.D. Computer Science — Sep 2022 - Current

Pomona College — Claremont, CA
B.A. Computer Science; B.A. Mathematics — Sep 2018 - May 2022

Experience

UC Santa Cruz CSE — Santa Cruz, CA
Graduate Student Researcher — September 2022 -Current

- Investigating the sim-to-real reality gap problem in autonomous vehicles
- Interested in seeing if explanations verify robustness of complex systems
- Trained a PyTorch object-detection model with accuracy up to 75% on NuImages

Pomona College ARCS Lab — Claremont, CA
Computer Vision and Robotics Research Assistant — May 2021 - August 2021

- Trained a regression CNN to navigate a maze with average 95% maze completion rate in simulation
- Programmatically created a bot to collect images for a dataset which increased navigation performance by at least 50%
- Wrote robust Python scripts that tabulate and visualize CSV results
- Applied a focal loss function in PyTorch to address dataset imbalance; this increased accuracy rates by 20%

Pomona College Data Science Research Circle — Claremont, CA
Statistics Research Assistant — January 2020 - June 2020

- Implemented a logistic regression model to show the probability of being searched by the police given multiple variables, revealing a true positive rate of 74% and and successfully replicating experiments
- Wrote an R script that used SQL to query many small datasets to concatenate and augment them into a novel dataset
- Made training time about 10 times faster by calling recursive functions

Pomona College FAIM Lab — Claremont, CA
AI Research Assistant — Aug 2019 - December 2019

- Tensorized an AI social simulation game called Comme ill Flow using TensorFlow
- Improved runtime of a procedural generation system
- Parse HTML data using standard Python libraries and then stored data as NamedTuple

Caltech, Tsao Lab — Pasadena, CA
Neuroscience Research Assistant — May 2019 - August 2019

- Ran a behavioral experiment on a photostimulated mice to see if they exhibit object craving behavior in a head-fixed paradigm; photostimulated the MPA-vPAG circuit.
- Fabricated a testing apparatus where mice stand on a track ball by 3D printing, laser cutting, and soldering materials
- Designed 3D printed laser sensor mounts in SketchUp and attached them to a ball to track the movement of a mouse
- Wrote reusable MATLAB code to make histograms, heatmaps, and movies of the mouse's eye with live plotting

Skills

Programming Languages:	Java (expert), Python (expert), MATLAB (proficient), R (expert)
Technical Tools:	SQL, git, command line, terminal, Arduino, Ubuntu
Languages other than Enlgish:	Spanish (native speaker)

Publications

Chang, O., Marchese, C., Mejia, J., and Clark, A. (2021) "Investigating Neural Network Architectures, Techniques, and Datasets for Autonomous Navigation in Simulation" *IEEE Symposium Series on Computational Intelligence*

Awards

Cal Grant Recipient — California Student Aid Comission
2018, 2019, 2020, 2021

NCAA DIII Cross Country National Champions — NCAA
2019, 2021

Pell Grant Recpient — Federal Student Aid
2018, 2019, 2020, 2021