Ariel N. Lee

@ ariellee@bu.edu | LinkedIn | GitHub | Portfolio | Boston, MA

Education

M.Sc., Boston University (BU) — Boston, MA
Electrical & Computer Engineering, Subconcentration: Data Analytics; ***GPA: 3.71*** — *Sep 2020 – Jun 2023*
Activities: Out in STEM; Graduate Women in Science & Engineering
Relevant Coursework: Machine Learning, Deep Learning, Artificial Intelligence, Computer Vision, Advanced Algorithms, Optimization Theory & Methods, Optimization for ML

B.Sc., University of California, Los Angeles (UCLA) — Los Angeles, CA
Microbiology, Immunology, & Molecular Genetics (MIMG); ***GPA: 3.45*** — *Sep 2011 – Jun 2015*

Publications & Competitions

[**Paper, Arxiv 2023**] - Under Submission
Ariel N. Lee, Sarah Adel Bargal, Janavi Kasera, Stan Sclaroff, Kate Saenko, Nataniel Ruiz. "Hardwiring ViT Patch Selectivity into CNNs using Patch Mixing" *arXiv preprint arXiv:2306.17848 (2023)*

[**Competition, META AI 2023**]
Meta AI Video Similarity Challenge: **8/196** overall, **1/42** in AI grad course

Graduate & Post-Graduate Research Experience

Platypus-30B — Boston, MA
Independent Researcher, Large Language Models — *Jun 2023*
- Curated a dataset of 110,000+ question-answer pairs focused on STEM and logic for instruction fine-tuning Meta's LLaMa model using Low-Rank Adaptation on 4 A100 80GB GPUs.
- **Platypus-30B and merged variants currently rank 6, 7, and 11 in the world** according to the HuggingFace LLM Leaderboard. More models to come.

Boston University — Boston, MA
Graduate Researcher, Computer Vision — *Oct 2022 – May 2023*
- Worked with **Dr. Nataniel Ruiz**, **Prof. Sarah Adel Bargal**, and **Prof. Kate Saenko** to research patch selectivity in modern convnets and ViTs. Released datasets for public use.
- Introduced new c-RISE explainability method to show that, by training CNNs with Patch Mixing, we simulate the natural ability of ViTs to ignore out-of-context information. NeurIPS submission pending.

TeachForward & BU Wheelock Educational Policy Center — Boston, MA
Data & Process Engineer, MLOps Dev Team — *Sep 2022 – Dec 2022*
- Developed a feature extraction pipeline to analyze the use of teaching time based on 10,000+ videos of classroom observations.
- Created a simple user interface for client using gradio and Hugging Face spaces. User uploads a video and the pipeline returns mp4 files with object and activity detection annotations, among others.

Boston University, AI4ALL — Boston, MA
Research Intern, Computer Vision — *May 2022 – Aug 2022*
- Worked with **Dr. Nataniel Ruiz** and **Prof. Sarah Adel Bargal** on counterfactual simulation and testing of modern convnets and ViTs.

Work Experience

Boston University — Boston, MA
Deep Learning Course Grader — *Jul 2022 – May 2023*
- Handled grading and answered student questions for the Deep Learning graduate course with **Prof. Sarah Adel Bargal** and **Prof. Brian Kulis** for multiple semesters.

AI4ALL @ BU Boston, MA
Program Coordinator *May 2022 – Aug 2022*
- Organized and instructed a summer program for high school students dedicated to inclusion in AI.

eMinutes Los Angeles, CA — Boston, MA
Corporate Paralegal (Remote) *Aug 2019 – Mar 2021*
Manager of Entity Management *Oct 2018 – May 2019*
Corporate Paralegal *Apr 2017 – Oct 2018*
- Evaluated technology deficits on main website, where all document production and communication is handled through a web-based system.
- Managed and trained two law school clerks throughout their clerkship, and maintained corporate governance for 25,000+ entities in 50 states.

Law Offices of Sanford Jossen Los Angeles, CA
Paralegal *Oct 2016 – Apr 2017*
Legal Assistant *Oct 2015 – Oct 2016*
- Researched and drafted legal documents, and summarized complex medical records.

Projects

Ensemble Effect: Leveraging Fine-tuned Models for Prompt Prediction | *GitHub*
- Ensemble-based approach for predicting text prompts used to generate Stable Diffusion images.
- Surpassed the performance of traditional image captioning models by employing fine-tuned OpenAI CLIP and ViT models, along with the CLIP Interrogator (BLIP+CLIP), using a custom dataset of 105,000 image-prompt pairs.

Visual Odometry: Mapping Out the Camera Path | *GitHub*
- 3rd place in CS 585 Computer Vision class challenge, focused on estimating the camera path by recovering relative motion between successive frames.
- Implemented Random Sample Consensus (RANSAC) and linear triangulation from scratch for fundamental matrix and camera pose estimation, respectively.

Crypto of the Future: Reinforcement Learning | *GitHub*
- DL reinforcement algorithm — proximal policy optimization — to devise an automatically generating strategy for Ethereum transactions.
- LSTM is used to make predictions for next day closing prices, which are in turn used to construct the automatic policy.

Undergraduate Research Experience

UCLA Department of MIMG Los Angeles, CA
Undergraduate Researcher, Characterization of Novel Bacteriophages *Sep 2014 – Jun 2015*
- Worked with **Dr. Giorgia Pirino** to advance phage therapy research in the SEA-PHAGES project by isolating a novel bacteriophage: PH8s.
- Probed potential gene functions via electron microscopy and plaque assays, leading to a fully annotated genome added to the *NCBI GenBank database* and presented at the MIMG symposium.

UCLA Department of Psychology Los Angeles, CA
Undergraduate Researcher, Directed Research in Medicine *Jun 2014 – Aug 2015*
- Conducted research with **Dr. Thomas Minor** for senior project by using learned helplessness to model symptoms of Post-Traumatic Stress Disorder.

Skills

Programming & Technologies: Python (PyTorch, TensorFlow, NumPy, Pandas, scikit-learn), Java, MATLAB, OpenCV, GCP, Lambda Cloud, Git/GitHub, Hugging Face Hub (spaces, datasets, models), Docker, LaTeX

ML Techniques: LLM instruction fine-tuning, ViT training and fine-tuning, CNN training, novel data augmentation techniques, ML pipeline deployment, open-source models and datasets