

Brian Lee

781-686-4191 | brianjls@mit.edu | www.brianjls.com | brianjls | brianjls

Education

Massachusetts Institute of Technology

Cambridge, MA

Candidate for Bachelors in Artificial Intelligence and Decision Making (6-4), Physics (8)

Expected: May 2027

- Two year military leave from 2022-2024.
- Minor(s) in Chinese and Mathematics.
- **Selected Coursework:** Algorithms for Inference (Graduate), Deep Generative Modeling (Graduate), Machine Learning (Graduate), Computer Vision (Graduate), Symmetry for ML (Graduate), Robotic Manipulation, Networks, Design and Analysis of Algorithms, Computation Structures, Programming

Experience

Scene Representation Group

Cambridge, Massachusetts

Undergraduate Researcher (UROP)

September 2024 - Present

- Leading a first author research paper on Diffusion Modeling with Markovian Dynamics for Offline Reinforcement Learning and Planning tasks. Supervised by Vincent Sitzmann and Boyuan Chen.

Republic of Korea (R.O.K) Army

Inje, South Korea

Sergeant, CERT

February 2022 - Aug 2024

- Served as part of the III Corps Computer Emergency Response Team (CERT), monitoring cybersecurity infrastructure. Served as squad leader managing a squad of 10.
- Selected as one of the top 300 soldiers in the ROKA III corps, issued by III Corps Commander Lieutenant General Kim Bong-Su.
- 2nd place in the inaugural army cybersecurity CTF challenge. Issued by ROK Chief of Staff of Information Technology Major General Choi Chang-Un.

Sensebrain Technology

San Jose, California

Research Intern | Advisor: Huajin (George) Chen

June 2022 - Aug 2022

- Worked with the New Sensor Team on refocusing and bokeh blurring methods for mobile camera ISPs.
- Created a synthetic bokeh dataset from light field images captured using plenoptic cameras and post-capture refocusing.
- Used conditional GANs along with Sobel filters to generate natural bokeh effects. bokeh

Everaise Academy

Brookline, MA

Co-Founder

May 2020 - June 2021

- Co-founded a nonprofit e-learning startup for high school math/science competition participants, generating over \$25,000 in funding, publishing 4 textbooks, and bringing together over 250 students in the process.

Course Projects

BallPitNDF: Few-Shot Pouring with Local Neural Descriptor Fields

Course: 6.4210 Robotic Manipulation

September 2024 - December 2024

- Full-stack robotic manipulation system using a deep-perception, few-shot imitation learning paradigm using an energy minimization scheme with local neural descriptors for pouring tasks.
- Here is the final project document.

Robust Conditional Context Sampling with Unconditional Diffusion Models

Course: 6.S978 Deep Generative Models

September 2024 - December 2024

- Studied out of distribution context generalization for conditional diffusion models on numerical trajectory datasets in relation to data augmentation, and proposes the usage of unconditional diffusion models for inverse conditioning instead.
- Here is the final project blog post.

Single Image Super-Resolution Using Neural Implicit Representations

Course: 6.869 Computer Vision

March 2022 - May 2022

- Proposed a new method for single-image super resolution using neural fields. Compared its performance to methods such as bilinear interpolation and deep learning-based methods
- Here is the final project document.

Comparing Machine Learning Models for Robust ASL Classification

Course: 6.867 Machine Learning

October 2021 - December 2021

- Classify images in the ASL alphabet with machine learning methods such as: CNN, PCA/robust PCA with MLP, and PCA/robust PCA with Kernel SVM, comparing their accuracy and robustness to irregular data.
- Here is the final project document.

Skills

Programming Python (Pandas, PyTorch, Jax, Numpy, etc.), C/C++, HTML, Javascript

Miscellaneous Linux, Shell (Bash/Zsh), \LaTeX (Overleaf/R Markdown), Git.

Achievements

2023 **Republic of Korea Army CTF 2nd Place**

2022 **Tartanhacks (CMU) 1st Place**

2020 **USA Mathematical Olympiad Qualifier**

2020 **USA Physics Olympiad Semifinalist**

Publications

Bokeh-Loss GAN: Multi-stage Adversarial Training for Realistic Edge-Aware Bokeh

Brian Lee, Lei Fei, Huaijin Chen, Alexis Baudron

ECCV 2022 Workshops. ECCV 2022. Lecture Notes in Computer Science, vol 13802. Springer, Cham.

2023