Arthur Liang

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EDUCATION

Massachusetts Institute of Technology — Cambridge, MA
B.S. in Computation and Cognition, GPA: 5.0/5.0 — *Exp. May 2026*
B.S. in Mathematics, Concentration in Korean

- **Relevant Coursework:**
  - **Artificial Intelligence:** Deep Generative Models (G), Generative AI in Biology (G), Computer Vision (G), Computational Cognitive Science, Natural Language Processing, Neural Computation
  - **Programming:** Algorithms, Machine Learning, Fundamentals of Programming, Data Science
  - **Mathematics:** Algebraic Combinatorics, Topology, Linear Algebra, Multivariable Calculus, Probability & Random Variables
  - **Life Sciences:** Neurobiology, Neuroscience, Organic Chemistry, Biochemistry, Biology

EXPERIENCE

Altera — Menlo Park, CA
Research Intern, Advisors: Andrew Ahn, Guangyu Yang — *Jul. 2024–Present*

- Spearheaded long-term social progression initiative towards evolving goal-driven behavior and emotional continuity. Devised and optimized for social reasoning tasks, beating internal benchmarks and standardizing how we measure agent performance
- Scoped and implemented methods for real-time virtual screen capture, visual reasoning, and low-level action execution within digital agents. Refactored brain architecture and developed infrastructure for agent interoperability beyond Minecraft

MIT Computer Science & Artificial Intelligence Laboratory — Cambridge, MA
Undergraduate Researcher, Advisors: Bowen Jing, Jason Yim, Tommi Jaakkola — *Jan. 2024–Present*

- Project 1: Built an LLM-inspired joint sequential model of protein sequence and structure with exact model likelihood calculation, motif scaffolding, and RL-based fine tuning
- Project 2: Investigated latent flow models for unconditional protein generation, exploring different objectives, embeddings, and masking strategies as well as performing comprehensive ablation. Scaled extensive training runs and hyperparameter sweeps across multiple environments, leveraging distributed computing to optimize resource utilization
- Project 3: Led evaluation of protein representation learning methods (ESM, GearNet) to confer referral and grounding to protein language models for use in wet lab and classroom settings

Boeing — Seoul, South Korea
Machine Learning Research Intern, Advisors: Jay Oh, Siwook Nam — *May 2024–Jul. 2024*

- Project 1: Architected ensemble VLMs and formulated a transfer learning framework to automate and expedite maintenance inspections, reducing inspection time and improving defect detection rates
- Project 2: Developed a high-fidelity simulation environment for tail swapping, enabling realistic RL agent training/validation and improving policy effectiveness to optimize decision-making in disruption management

MetaConscious Group at MIT — Cambridge, MA
Undergraduate Researcher, Advisors: Katheryn Zhou, Christopher Cueva, Guangyu Yang — *Sep. 2023–Mar. 2024*

- Integrated multimodal data streams into CNN-RNN architectures, allowing for the fusion of diverse sensory inputs and improving the model's ability to simulate complex cognitive processes

- Discovered that training with biologically-inspired architectures on realistic visual representations can achieve similar performance levels and similarity scores to brain activity

Synthetic Neurobiology Group at MIT
Undergraduate Researcher, Advisors: Sapna Sinha, Edward Boyden

Cambridge, MA
Sep. 2022–Aug. 2023

- Employed ML protein engineering methods (Directed Evolution, GANs) and immunogenicity prediction models (NetMHCPan) to enable safer human integration of optogenetics by reducing opsin immunogenicity in the peripheral nervous system

Slesinger Laboratory at Icahn School of Medicine
Research Intern, Advisors: Isabel Gameiro-Ros, Paul Slesinger

New York City, NY
Apr. 2021–May. 2022

- Dissected the glutamate response in hiPSC-derived neurons and investigated the effects of acute and chronic alcohol exposure
- Spearheaded experimental design and improved existing algorithms for peak detection and AUC calculation

SERVICE

MIT Emergency Medical Services
Emergency Medical Technician

Dec. 2023–Present

- Provided essential medical assistance to individuals in need, offering comfort and care during emergencies ranging from minor injuries to critical incidents, ensuring their well-being and safety within the MIT community
- Effectively communicated and coordinated with diverse teams of responders and medical staff to deliver prompt and compassionate care, ensuring seamless transitions and optimal outcomes

MIT Hacking Medicine
Operations Committee Lead and Organizing Member

Sep. 2022–Present

- Organized MIT Grand Hack, an annual three-day healthcare hackathon with 500+ industry professionals to infect, energize, and empower a diverse, global community in healthcare entrepreneurship and innovation to scale medicine to attack and solve healthcare problems
- Represented the organization at global healthcare and medicine conferences to recruit potential sponsors, mentors, and participants as well as keep the organization up to date regarding up-and-coming technologies to iterate on our hackathon framework

The International Young Researchers' Conference
Vision Scholar and Peer Teaching Fellow, Advisor: Paul Lewis

Apr. 2021–Jun. 2022

- Collaborated with mentors internationally to organize the conference and co-hosted a STEM-minded podcast for high schoolers
- Developed and delivered a stroke module to 100+ high school students, equipping them with the knowledge to recognize key signs and symptoms and an educational tool-kit to inform their local communities as well

PROGRAMMING

- Python (PyTorch [Lightning], TensorFlow, NumPy, Matplotlib, pandas, scikit-learn, Openfold, hydra, NetworkX, BioPython, OpenCV, RDKit)
- JavaScript (MERN)
- SLURM, Git, AWS EC2, Terraform
- Linux, macOS, Windows

SKILLS

- Calcium Imaging, Confocal Microscopy
- Neural Induction, Transfection, Cell Culture
- Western Blotting, Staining
- Plasmid Cloning, PCR, Gel Electrophoresis

Teaching

- **Lab Assistant** for Introduction to Machine Learning (6.3900) *Fall 2024*
- **Teaching Assistant** for Emergent Computation Within Distributed Neural Circuits (9.53(0), G) *Spring 2024*
- **Teaching Assistant** for Multivariable Calculus (18.02) *Fall 2023*
- **Global Teaching Lab STEM Workshop Instructor** at the Korea International School *Winter 2023, 2024*
- **Peer Teaching Fellow** at the IYRC Summer Program on Medicine and Research *Summer 2022, 2023*

Invited Talks and Presentations

- International Association of Medical Science Educators: "Engaging Premedical Students With the Art of Medicine Through a Humanism-Based Summer Program"[†] *Jun. 2023*
- Terra NYC STEM Fair Finals Round: "A Pharmacological Approach for Studying Alcohol Use Disorder: Using Calcium Imaging on hiPSC-derived Glutamatergic Neurons to Dissect the Glutamate Response in the Context of Chronic Ethanol Treatment"[‡] *Mar. 2022*
- Junior Science and Humanities Symposium Regional Semifinal Round: "A Pharmacological Approach for Studying Alcohol Use Disorder: Using Calcium Imaging on hiPSC-derived Glutamatergic Neurons to Dissect the Glutamate Response in the Context of Chronic Ethanol Treatment"[*] *Feb. 2022*
- Stuyvesant High School Molecular Science Elective: "A Brief Introduction to Conducting Research as a High Schooler"[*] *Feb. 2022*
- NYCSRMC Annual Student Research Colloquium: "Analyzing β-glucuronidase expression in gut microbial populations of MS patients and healthy controls"[†] *Jun. 2021*
- DNA Barcoding Virtual Symposium: "Analyzing β-glucuronidase expression in gut microbial populations of MS patients and healthy controls"[†] *Jun. 2021*
- The International Young Researchers' Conference: "Development of an Aptamer-Gold Nanoparticle Assay for Field Use in Informing 'DIY-HRT'"[‡] *Mar. 2021*

    ($\dagger : Poster, * : Talk, \ddagger : Paper$)

Awards and Honors

- Lepper/Fink/Zwobda/Sombrotto Scholarship *Jun. 2022*
- Marjorie Tallman Scholarship *Jun. 2022*
- Irene Finkel Memorial Award for Excellence in Mathematics *Jun. 2022*
- NYS Education Department's Scholarship for Academic Excellence *Jun. 2022*
- Science Olympiad Academic Competition Certificate of Achievement *Jun. 2022*
- **Regeneron International Science and Engineering Fair: 2nd Place Special Award Winner** *May 2022*
- **Regeneron International Science and Engineering Fair: Finalist** *Mar. 2022*
- **Terra NYC STEM Fair: 1st Place Grand Award Winner in Neuroscience** *Mar. 2022*
- National Merit Scholarship Winner *Mar. 2022*
- Junior Science and Humanities Symposium: Regional Winner in Oral Presentations *Feb. 2022*
- Junior Science and Humanities Symposium: Regional Semifinalist *Feb. 2022*
- **American Invitational Mathematical Examination Qualifier** *Jan. 2022*
- AP Scholar with Distinction *Jun. 2021*
- **National Brain Bee: 5th Place** *Apr. 2021*
- Westchester Brain Bee: 1st Place *Mar. 2021*
- **USA Biology Olympiad: Semifinalist and Top 75** *Mar. 2021*

- The International Young Researchers' Conference: STEM Honorable Mention *Mar. 2021*
- National At-Home STEM Competition: 1st Place in Science *Jan. 2021*
- National Latin Exam: Gold Medalist *Mar 2019–2021*

ACTIVITIES

- Google CS Research Mentorship Program *2023*
- Goldwater Ambassadors Program *2023*
- MIT Korean Cultural Association (Historian) *2022-*
- MIT Sport Taekwondo (Tournament Coordinator, Social Chair) *2022-*
- Columbia Department of Biomedical Informatics Summer Fellowship Program *2022*
- CDC Museum Public Health Academy *2022*
- Columbia Science Honors Program *2020–2022*
- The Mount Sinai Hospital Recreational Therapy *2019–2020*
- StuyFlow · StuyLumière *2019–2022*
- Stuyvesant Science Olympiad (Captain) *2019–2022*
- The Stuyvesant Spectator (Science Writer) *2019–2020*
- Boy Scouts of America (Senior Patrol Leader) *2015–2022*