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: Computer Vision (G), Generative AI (G), Natural Language Processing, Emergent Computation Within Distributed Neural Circuits

  Programming: Algorithms, Machine Learning, Fundamentals of Programming, Data Science

  Mathematics: Algebraic Combinatorics, Linear Algebra, Multivariable Calculus, Probability & Random Variables, Differential Equations

  Life Sciences: Neuroscience, Organic Chemistry, Biochemistry, Biology

Experience

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

- Built an LLM-inspired joint sequential model of protein sequence and structure that improves SOTA with exact model likelihood calculation, motif scaffolding, and RL-based fine tuning (to be submitted to NeurIPS 2024)
- Formulated multimodal design tasks, scaled training runs, and implemented subroutines to evaluate results against baseline models

Somn (YC W24) — Cambridge, MA
Machine Learning Engineer — *Jan. 2024–Feb. 2024*

- Implemented data preprocessing techniques and feature engineering on diverse location and time-series datasets, enhancing the accuracy and efficiency of a user landmark pattern recognition model for optimized deployment

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

- Designed novel CNN-RNN brain models that capture complex sensory representations of cognitive tasks
- 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 — Cambridge, MA
Undergraduate Researcher, Advisors: Sapna Sinha, Edward Boyden — *Sep. 2022–Aug. 2023*

- Employed machine learning protein engineering approaches and immunogenicity sequence prediction software to lead an effort for making human optogenetics more human-compatible by reducing opsin immunogenicity in the peripheral nervous system

Shen Lab at Columbia University — New York City, NY
Research Intern, Advisors: Chang "April" Shu, Yufeng Shen — *Jun. 2022–Aug. 2022*

- Adapted an MCMC Bayesian analysis method for analyzing rare de novo variants from ASD patients to identify 10+ novel risk genes and further corroborate the influence of known risk genes
- Implemented Poisson hypothesis testing and verified a preprocessing annotation map for categorizing mutation variants

Slesinger Laboratory at Icahn School of Medicine New York City, NY
Research Intern, Advisors: Isabel Gameiro-Ros, Paul Slesinger *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

Google Mentorship Program New York City, NY
Software Engineering Mentee, Advisors: Alex Feng, Rachel Yang *Feb. 2021–Jun. 2021*

- Developed *Quarcade*, a web-based platform for hosting party games like *Bananagrams* during the pandemic quarantine, with a team of three peers

Service

MIT Hacking Medicine
Operations Committee Lead and Organizing Member *Sep. 2022–Present*

- Organized MIT Grand Hack, an annual three-day healthcare hackathon with 300+ industry professionals in attendance, 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

MIT Brain & Cognitive Sciences Society
DEI Chair and General Board Member *Sep. 2022–Present*

- Served as a liaison between the student body and departmental admin to advance and implement wide-scale policy changes according to the unique background of the department to promote inclusion

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

Stuyvesant Biology Olympiad
Founder and President *Apr. 2020–Jun. 2022*

- Fostered an engaged community of 200+ young biologists and trained eight USABO Semifinalists by facilitating three weekly meetings and monthly events ranging from hosting lessons and laboratory demonstrations to administering original mock exams and competitions
- Launched a tightly-knit, high-intensity research group aiming to teach students scientific writing, reading, and presentation skills invaluable to their future research pursuits
- Created a centralized organizational system for storing club resources, managing projects, and expediting board operations

Skills

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

Programming

- Python (NumPy, Matplotlib, pandas, scikit-learn, PyTorch, OpenFold)
- JavaScript (MERN)
- R
- Linux/Unix

Teaching

- **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*
- MIT Emergency Medical Services *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*
- Stuyvesant Big Sib Mentoring Program *2022*
- CDC Museum Public Health Academy *2022*
- Stuyvesant Alumni Mentoring Program *2021*
- 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*