Michael Huang

Cambridge MA | 978-238-6847 | yh_huang@mit.edu | michaelyhuang.org | also known as Yihao Huang | Available to work May 2024 to August 2024 anywhere

Education

Massachusetts Institute of Technology, Cambridge, MA 2027
Bachelor of Science in Electrical Engineering and Computer Science
Coursework: Abstract Algebra, Machine Learning (grad-level), Solid State Chemistry, Problems of Philosophy

Phillips Academy, Andover, MA 2023
GPA: 5.95/6.0, SAT: 1590
Coursework: Information Theory, Formal Language Theory, Data Structure and Algorithms, Multivariable Calculus, Linear Algebra, Fluid Mechanics, Quantum Physics
Leadership roles: co-president @ CS Club, Physics Club, Chemistry Club, and VEX Robotics Club

Experience

Research Science Institute [Teaching Assistant] July 2023 – August 2023
- Provided mentorship for precollegiate student researchers in computer science and physics
- Judged student paper and presentations for the Research Science Institute paper and presentation awards

The Andover Computing Open [Founder, Tournament Director] March 2021 – May 2023
- Founded a competitive programming tournament to expand student access to competitive programming
- Directed the tournament for 2 years and served as workshop coordinator for 1 year, growing the tournament community to over 350 members
- Created and test-solved 20 CS Olympiad problems and secured over 7k sponsorship for the tournament

The Revere, Foreign Affairs Newspaper [Digital Director, Writer] December 2021 – May 2023
- Designed the web interface and wrote geopolitics commentaries for The Revere

Window Cleaning Drone [Leader] December 2019 – May 2022
- Led an 8-person engineering team to build a flyable test-of-concept drone that can power wash windows
- Designed a novel machine learning based window detection device that makes use of the polarization effect of windows for accurate window localization

Human Robot Interaction Lab [Machine Learning Intern] June 2021 – December 2021
- Improved the Tuft University lab's robotics vision system by integrating the YOLOv3 object detector
- Researched few-shot object detection

Research & Publications

Improving Multi-Modal Contrastive Learning Ongoing
Michael Huang, Rumen Dangovski, Charlotte Loh, Marin Soljacic (MIT CSAIL)
Image generative AI like DALLE-2 and Midjourney uses contrastive learning to connect the user-input text with the image modality. I work on extending contrastive learning to connect more than two modalities in material science datasets. We connect material crystal structures, charge density, electronic band structure, and electronic DOS to generate an integrated material embedding for downstream tasks.

Using Graph Neural Network to Discover Dwarf Galaxies in the Milky Way Ongoing
Michael Huang, Tri Nguyen, Xiaowei Ou, Lina Necib (MIT Kavli Institute)
Apply graph neural networks and spectral clustering to find dwarf galaxies accreted by the Milky Way.

Faster Parallel Exact Density Peaks Clustering ACDA'23
Michael Huang, Shangdi Yu, Julian Shun (MIT CSAIL)
Developed the priority search kd-tree data structure, and applied it to a parallel density-peaks clustering algorithm that outperform existing density-peaks clustering algorithms by up to 13000x.

Efficient Algorithms for Parallel Bi-core Decomposition APoCS'23
Michael Huang, Claire Wang, Jessica Shi, Julian Shun (MIT CSAIL)
Developed efficient algorithms for bi-core decomposition, which is applied in fraudster detection and bioinformatics for analyzing bipartite graphs. Outperformed existing algorithms by up to 4.9x.

Awards & Accomplishments

International ST-Yau CS Research Award 1st Place [2021], 2nd Place [2022] (China's premier research competition for precollegiate students); ***Research Science Institute*** Top 5 Paper Award [2022] (best research program for precollegiate students, selects 93 people around the world); ***USA Computing Olympiad*** Finalist [2022] (top 25 nationally); ***Davidson Fellows Scholarship*** [2023] (selects 21 students nationally***); Regeneron STS*** Scholar [2023] (top 300), ***Atlas Fellowship*** (<1% acceptance rate) [2023].

Skills & Interests

Deep Learning, Performance Engineering, Parallel Computing, Algorithms, Web Development, Engineering, Game Development, Leadership, Writing (write political philosophy, and meta-ethics @www.daylightreveries.org)
Proficient Programming Languages & Tools: Python, C++, Java, JavaScript; Torch, MEVN Stack, Unity 3D