Yajvan Ravan

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EDUCATION

Massachusetts Institute of Technology (MIT) GPA: 5.0/5.0
*Candidate for **Masters** in Electrical Engineering and Computer Science* *Jun 2026*
*Candidate for **Bachelors** in Electrical Engineering and Computer Science* *Jun 2025*

Relevant coursework: Computer Architecture Design/Analysis of Algorithms Machine Learning Computer Vision Statistical Inference Reasoning/Inference in AI Reinforcement Learning Matrix Methods Computer Lang. Engineering Controls

Extracurriculars: Phi Beta Epsilon Fraternity, MIT Entrepreneurship Club, Class Council Social Chair, Camp Kesem

University of Michigan, Oakland University, Schoolcraft College Jun 2021
Dual enrolled High-School Student in Mathematics *GPA: 4.0/4.0*

Relevant coursework: Real Analysis Linear Algebra Graph Theory Number Theory Differential Equations

Churchill High School Jun 2021
***Awards:** Gold Medal at the International Chemistry Olympiad | USA Math Olympiad 2-time Qualifier **SAT:** 1570* *GPA: 4.0/4.0*

INTERNSHIP EXPERIENCE

MIT CS & AI Lab / *Robotics/AI Research Intern* *(Learning and Intelligent Systems Group, Isola Lab)* *Aug 2023 - Present*

- Worked on scaling imitation learning for manipulation from generative models + human demonstrations in VR + MuJoCo
- Helped build in-browser, WebAssembly/Typescript simulation/visualization software for VR headset
- Designed system to record human demonstrations on Boston Dynamic's Spot robot and execute chair manipulation
- Designed pipelines for **diffusion-based** policy in PyTorch, mapping scenes with depth cameras, & A* + RRT algorithms
- Co-first-author of *Lucid-XR: An Extended-Reality Data Engine for Robotic Manipulation* (Conference on Robot Learning 2025)
- First-author of *Combining Planning and Diffusion for Mobility with Unknown Dynamics* (arXiv Preprint arXiv:2410.06911)
- Co-author of *LucidSim: Learning Visual Parkour from Generated Images* (Conference on Robot Learning 2024)

NASA / *Computer Vision Intern* *Jun 2023 – Dec 2023*

- Built a real-time deep-learning wildfire detection system in Python/OpenCV/Tensorflow, and demonstrated in simulation
- Designed classification + segmentation networks for multispectral imagery including literature review, training, and testing.
- Created synthetic dataset by processing remote-sensing imagery (geospatial data) & using StableDiffusion/ControlNet
- Presented to NASA wildfire teams. Submitting paper to Computer Vision & Pattern Recognition Conference (CVPR) 2025

PROJECTS

MITScript Compiler & Interpreter *Sep 2024 - Present*

- Project to design a optimized virtual machine + garbage collection for the MITScript dynamic programming language
- Wrote a parser in C++ to build a parse tree of program constructs (expressions, if statements, etc.) from input program.
- Wrote and optimized a bytecode interpreter in C++ with a garbage collector

Pruning Neural Networks with Matrix Methods *May 2024*

- Designed 3 algorithms to speed up NNs using random matrix multiplication, PCA, and low-rank multiplications
- Conducted experiments on fully connected networks and CNN implementations. Wrote a report and presented.

BeaverNav Web Application *Jun 2022 - Present*

- Designed a 10000+ line web app for indoor navigation at MIT in Python. Designed software architecture & automated testing
- Optimized novel image processing algorithms & optical character recognition algorithms to scrape text data from 300+ floor plans
- Designed custom network graphs from floorplans. Gave a talk at AI @ MIT club, & demonstrated navigation across campus.

HackMIT Hackathon: PlugLess (Winner of New Frontiers Track) *Oct 2022*

- Developed a holographic Nintendo Switch controller, by decoding finger movement with computer vision, a webcam, & MediaPipe.
- Built in 24hrs: We demonstrated the ability to play Mario Kart and won the New Frontiers track at HackMIT.

SKILLS

Technical Frameworks: Python, C, C++, Java, OpenCV, Tensorflow, Pytorch, Linux, Git, Bash, Conda, Matlab
Experienced In: Data Structures, Algorithms, Computer Architecture, AI, Deep Learning, Computer Vision, Robotics, Strong Mathematics Skills