Maya Guru

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EDUCATION

University of Pennsylvania, *Philadelphia, PA* May 2023
Master of Science in Engineering (Robotics) and Bachelor of Science in Engineering (Computer Science)
Publications: Publication in CoRL 2024, First Author Research Publication in IEEE CCNC 2017; Research Publication in Nature Oncogene, Regional Finalist in Siemens Competition in Math, Science and Technology 2015

SKILLS & INTERESTS

Skills: Python; C; C++; Linux; ROS2, Mujoco, Gazebo, Torch, OpenCV, Tensorflow, Arduino, Matlab, Git
Interests: Enabling embodied agents to intelligently perceive of and understand the world around them to solve complex, long horizon tasks

PROFESSIONAL EXPERIENCE

Ai2, *Predoctoral Young Investigator* | Seattle, WA July 2025-Present
- Conducting real world evaluations on robot hardware for vision based navigation policy
- Investigating vision based whole body manipulation policies for contact rich task settings

RAI Institute, *Roboticist* | Boston, MA July 2023-July 2025
- *Embedded software*: integrated MicrostrainIMU and ODrive motors into software stack, calibrated for robust state estimation
- *Manipulation*: Co-authored a paper presented at CoRL 2024 titled "Jacta: A Versatile Planner for Learning Dexterous and Whole-body Manipulation". doi: https://doi.org/10.48550/arXiv.2408.01258
- *Perception*: developing a real time scene graph construction algorithm to facilitate long horizon manipulation tasks via observing humans

University of Pennsylvania- CIS 3800 (OS) MCIT 595 (C++ for linux) , *Teaching Assistant* | Philadelphia, PA Jan 2022-May 2023
- Worked with Prof. Boon Thau Loo to help prepare course material for operating systems class (coursework done in C)
- Taught recitation sections and answered student questions in office hours
- Lead two teams of 5 in their efforts to build their own operating system and guiding the development process

xLab: Safe Autonomous Systems Lab, *Research Intern*| Philadelphia, PA Jan 2020 – May 2023
- Worked with mentors Rahul Mangharam, Ph.D, and Johannes Betz, Ph.D
- Gained experience working with simulators and motion planners
- Created and validated a tool to empirically identify safe and ethical behavior in planned AV trajectories
- Wrote a preprint as co-first author titled, "An Ethical Evaluation for Autonomous Path Planners in Road Scenarios"

Perceptive Automata *Data Research Intern* | Boston, MA May 2022-June 2022
- Developed a model and visualization scheme to empirically determine biases present in pedestrian detection data
- Used metrics such as cross entropy and information gain to determine the disagreement between data annotators and explaining power of each annotated feature of a driving scene in human decision making and reactions to pedestrians

Broad Institute of MIT and Harvard, *Research Intern*| Boston, MA Jul 2019 – Aug 2019
- Worked with Gad Getz, Ph.D, at the Broad Institute of MIT and Harvard
- Analyzed RNA sequence data using the Python pandas library to determine overexpressed genes in lung cancer cells
- Developed a decision tree and MLP using tensorflow to classify cells of non small-cell lung cancer and to model the relationship between expression of different genes and cancer cell identity through software

University of Alabama at Birmingham, *Research Intern* | Birmingham, AL Jun 2016– Jan 2017
- Worked with mentor Ragib Hasan, Ph.D., Assistant Professor at the Department of Computer and Information Sciences
- Crafted a prototype for a Smart Hospital Gown that utilizes Arduino sensors and compute nodes built into a gown to collect patient vitals unobtrusively and transmit data
- Presented research and prototype at IEEE CCNC conference in Las Vegas, January 2017, first author on paper titled "Towards non-intrusive continuous healthcare monitoring with the Smart Hospital Gown". IEEE, doi: 10.1109/CCNC.2017.7983193

TECHNICAL PROJECTS

Implementing Preventive Driving Behavior in Autonomous Path Planners (MS Thesis) August 2022-May 2023
- Co-advised by Prof. Dinesh Jayaraman and Prof. Rahul Mangharam
- Identified methods to implement common sense and predictive reasoning in autonomous path planners
- Developed a standard for safety that is higher than simple collision avoidance by ensuring preventive measures are taken
- Collaborated with research group looking into blame assignment tactics in the event of collision

Automating Dubs Using Speech to Speech Translation and NLP (Bachelor's Capstone) August 2022-May 2023
- Worked in a team of 5 advised by Prof. Chris Callison Burch to develop an NLP pipeline to take a movie in one language, translate it to a new language, and output the audio waveform in the original actor's voice (demo video here)
- Developed a Speech to Text (STT) and Text to Speech (TTS) pipeline as an MVP using open source models on HuggingFace
- Scraped a dataset of audio in one language and corresponding translated audio to facilitate a potential direct speech to speech model and facilitate end to end learning

Full Stack Autonomous Vehicle with V2V Communication May 2022
- Developed a full stack autonomous vehicle including from scratch including chassis, circuits, motors, controllers, and sensors such as Hokuyo LiDAR and V2V communication module for interaction with other cars
- Programmed in ROS C++ to parse sensor information and plan optimal route to then control the car's motors
- Learned skills such as power management, AVR C, and circuitry to bridge hardware and software components

Inverse Reinforcement Learning to Simulate Human Driving Behavior May 2022
- Modified an existing RL highway driving environment to imitate features of human driving and learn a corresponding reward function
- Applied the learned reward function in an autonomous vehicle simulator to quantify differences in safety when imitating human driving versus using a standard path planner (A* search with kinematic constraints)