Akila Saravanan

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Passionate and self-motivated problem-solver with experience developing software for air & spacecraft systems. A Senior at MIT on track to graduate in Jan 2023 with B.S. (dual) degrees in Aerospace & Computer Science and a minor in Writing.

Education

Massachusetts Institute of Technology (Technical GPA 5.0/5.0)

Class of 2023 *Candidate for Bachelors of Science degrees in Aerospace Engineering and Computer Science [double major], Minor in Science Writing & Communication*

- Relevant Courses: Automatic and Feedback Control, Autonomy and Decision Making, Robotic Manipulation, Signals and Systems, Algorithms and Data Structures, Machine Learning, Probability, Linear Algebra, Differential Equations, Aerospace Design
- Professional development with the Gordon Engineering Leadership Program, focused on being an effective leader in engineering contexts to complement technical experience

Work Experience

May '22 – Aug '22
Engineering Intern
Venturi Astrolab [Hawthorne, CA]

- Researched and integrated new message passing protocols to communicate between ground control and on-board computers for lunar rovers
- Tracked fiducials for pose estimation and localization to plan travel trajectories for the rover

Dec '21 – Jan '22
Investment Analyst Intern
Meru Capital Group [New York, NY]

- Analyzed companies and industries in technology, telecom, entertainment and cryptocurrencies to make private and public equity investment decisions
- Followed macroeconomic data and market trends to understand the investing climate

May '21 – Aug '21
Software Engineering Intern
Princeton Satellite Systems [Plainsboro, NJ]

- Developed software for moon lander guidance, navigation & control with NASA SBIR funding
- Implemented convolutional & recurrent neural nets (CNN/RNNs), ResNets, and algorithmic image upsampling to simulate trajectories from orbit to ground
- Worked independently on the module while documenting the design rationale and methodology for seamless integration with the overall control system

May – July '20 & June – July '21
Camp Counselor and Research Mentor
NJ Governor's School of Engineering and Technology (Rutgers University) [Newark,NJ]

- Worked in a team to swiftly transition the four-week intensive STEM program for exceptional high school students online, due to the pandemic
- Maintained continuous communication with students, mentors and staff to create an enriching and novel program in an evolving environment
- Taught ML classes and mentored groups on related research projects

Academic Experience

Oct '19 – Present
Undergraduate Student Researcher
MIT Dynamics, Infrastructure Networks and Mobility Lab (DINaMo) [Cambridge, MA]

- Analyzed traffic patterns with CNNs using real-time data from a swarm of drones
- Developed a coupled optimal location finder (clustering) and scheduler (multi-integer linear program) to facilitate drone swarm planning while enforcing continuity in data collection
- Used robustness testing to identify gaps in algorithms, and implemented improvements

Aug '20 – Present *NJIT I-Corps [Newark, NJ]*

- Constructed a robotic crawler, gathered and pre-processed culvert data from 360-degree cameras. Paper published in ASCE's Journal of Pipelines Systems Engineering Feb 2019
- Currently automating the defect identification process using ML for an end-to-end commercial solution with support from NSF I-Corps for entrepreneurial training

Sept – Dec '19 *MIT Beaver Works and Lincoln Labs [Cambridge, MA]*

- Applied data science methods for space situational awareness to estimate satellite orbits and identify unexpected behavior to prevent collisions
- Collaborated with a multidisciplinary team to brainstorm approaches to analyze data

June – Oct '18 *NJ Governor's School of Engineering and Technology (Rutgers University) [New Brunswick, NJ]*

- Developed CAD models of ornithopter wings and control surfaces, integrated printed parts with an Arduino for control and navigation, programmed wind-correction with sensor input
- Presented research paper at MIT IEEE Undergraduate Research Technology Conference

Skills, Awards & Leadership

Software Python, Java, MATLAB, Arduino/C++, TensorFlow, PyTorch, OpenCV

License Private Pilot and Remote (Drone) Pilot

Publications & Presentations

1. "Pose Estimation Using ChArUco Fiducial Markers for Lunar Rover Navigation - 2022 Astronaut Scholar Technical Conference: Aug '22
2. "Drone Sensing and Intelligence: Path Planning for Continuous Data Collection on Mobile Drone Platforms" - MIT Advanced Undergraduate Research Symposium: May '22
3. "Franken-Models: Combining Unique Machine Learning Model Features for Visual Question Answering" - MIT Electrical Engineering and Computer Science Student Symposium: May '22
4. "Neural Space Navigator: Autonomous Guidance of a Moon Lander for Orbit-to-Ground Descent" - 14th Wernher von Braun Memorial Symposium Student Poster Competition: Oct '21
5. "Using Fused Neural Networks for a Multi-sensory Approach to Human Emotion Classification Video" - Mentor: Governor's School of Engineering & Technology Research Journals: Jul '21
6. "Biological Motion Perception: Reconstructing Skeletons from Point-Light Walkers" - MIT Brain and Cognitive Science Symposium: Dec '20
7. "Electronic Ornithopter Systems: Manual Navigation and Autonomous Hovering in Micro Air Vehicles" - 2018 Governor's School of Engineering & Technology Research Journals: Jul '18
8. "Adapting 360-Degree Cameras for Culvert Inspection: Case Study" - ASCE Journal of Pipeline Systems: Aug '17

Awards Astronaut Scholar Class of 2022 [awarded by the Astronaut Scholarship Foundation]

Brooke Owens Fellow Class of 2022

Andrew J. Morsa Prize '22 from MIT AeroAstro for the design and development of a drone-based platform for continuous aerial sensing

Certificate in Advanced Undergrad Research in AeroAstro presented by Dean of Engineering '22

Academic Excellence Award '22 for Degree in Computation and Cognition

Boeing Undergraduate Research and Innovation Scholar 2021-22

Leadership *MIT Flying Club* Sep '19 – Present: Webmaster Sep '19 – Jun '20, President June '20 – Present

MIT Sport Taekwondo Sep'19 – Present: Tournament Coordinator Jan – Jun'20; VP Jul'20 – Present

Tech Flight Corp - A Boston based 501(c)(3) that owns and operates aircraft for student flight training. Jun '20 – Present: Board Member responsible for accounts, and outreach

Sustainability Initiatives Sep'17 – Present:

- West Windsor Township, NJ - Community organizer for single-use plastic bag ban
- MIT Waste Watchers + Trash-to-Treasure - Waste reduction campaign volunteer

Extra Curriculars Piano, Carnatic (Indian Classical) Violin, Acapella, Taekwondo, Civil Air Patrol, Golf

Languages English, Spanish, Sanskrit, Hindi