Job Description Highlights: Faculty Position

Responsibilities

1. Undertake research in the field of AI, vision based GNC of autonomous vehicles (Space, Drones and ground vehicles)

2. Undertake research from algorithm development to real time implementation.

3. Prepare, publish, and present papers and presentations on the related work for highly ranked Journals and major meetings and Conferences, as specified by the Principal Investigator.

Experience

4. Capability to carry out research on one or more of the following areas: Autonomous Vehicles, AI and Deep Learning, Vision based GNC, Robotics, Computer vision, Embedded and Realtime Systems

5. Knowledge of Vehicles dynamics and modeling

6. Experience of processing of data and presenting results in a suitable format for dissemination of results in reports presentations, and research papers etc.

Skills and Abilities

7. Demonstrable knowledge of Programming skills (Python/C++/Matlab)

8. Interest in developing AI and deep learning-based solutions

9. An ability to work effectively with research staff, students and customers

10. An ability and willingness to learn new technical skills

11. Demonstrate the ability to meet deadlines and work under tight time scales

12. Demonstrate excellent verbal and written communication skills

Sydney Dolan

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github.com/sydneyid

Name and contact information at the top

Education

Education first with advisors listed

2021 – Present	**PhD in Aeronautics and Astronautics,** Massachusetts Institute of Technology
	Advisor: Hamsa Balakrishnan
2019 – 2021	**M.S. in Aeronautics and Astronautics,** Massachusetts Institute of Technology
	Advisor: Ed Crawley
2015 – 2018	**B.S. in Aeronautical and Astronautical Engineering,** Purdue University

Publications

For an academic CV, publications are important, so putting them as one of the first sections is recommended

JD 3, 7, & 8

Journal Publications and Refereed Conference Papers

1. **Sydney Dolan**, Siddharth Nayak, and Hamsa Balakrishan. "Satellite Coordination and Navigation with Limited Sensing". Submitted to *Journal of Guidance, Control, and Dynamics,* 2024. Under Review.
2. Jasmine Jerry Aloor, Siddharth Nayak, Sydney Dolan, Hamsa Balakrishnan, "Cooperation and Fairness in Multi-Agent Reinforcement Learning." Submitted to *Association for Computing Machinery,* 2024. Under Review
3. **Sydney Dolan**, Siddharth Nayak, Hamsa Balakrishnan. "Satellite Navigation and Coordination with Limited Information Sharing.*" Learning for Dynamics and Control*, 2023
4. Siddharth Nayak, Kenneth Choi, Wenqi Ding, **Sydney Dolan**, Karthik Gopalakrishnan, Hamsa Balakrishnan. "Scalable Multi-Agent Reinforcement Learning through Intelligent Information Aggregation" *International Conference on Machine Learning*, 2023
5. Tyler Horvath, Jack Conrad, Jason Dekarske, **Sydney Dolan**, Brynna Downey, Ryan Felton, Alena Giesche, Lavender Elle Hanson, Tyler Horvath, Rachel Maxwell, Andrew O. Shumway, Anamika A. Siddique, Amanda Steckel, Caleb Strom, Bronwyn L. Teece, Jessica Todd, Kevin T. Trinh, Micheal A. Velez, Callum A. Walter, Leslie Lowes, Troy L. Hudson, Jennifer E. C. Scully, "The Architecture of Nautilus: A Multi-Flyby Mission Concept to Triton." *American Geophysical Union,* 2023.
6. Amanda Steckel, Jack Conrad, Jason Dekarske, **Sydney Dolan**, Brynna Downey, Ryan Felton, Alena Giesche, Lavender Elle Hanson, Tyler Horvath, Rachel Maxwell, Andrew O. Shumway, Anamika A. Siddique, Caleb Strom, Bronwyn L. Teece, Jessica Todd, Kevin T. Trinh, Micheal A. Velez, Callum A. Walter, Leslie Lowes, Troy L. Hudson, Jennifer E. C. Scully, "The Science Case for Nautilus: A Multi-Flyby Mission Concept to Triton." *American Geophysical Union,* 2023.
7. Inigo del Portillo, **Sydney Dolan**, Bruce G. Cameron, Edward F. Crawley. "Architectural Decisions for Communications Satellite Constellations to Maintain Profitability While Serving Uncovered and Underserved Communities" *International Journal of Satellite Communications and Networking*, 2022

Conference Publications and Workshops

Highlighting your name within publications helps the reader easily see your contributions

JD 3, 7, & 8

8. Jasmine Aloor, Siddharth Nayak, **Sydney Dolan**, Victor Qin, Hamsa Balakrishnan. "Towards Cooperation and Fairness in Multi-Agent Reinforcement Learning." *Reinforcement Learning Conference* Workshop on Coordination and Cooperation in Multi-Agent Reinforcement Learning, 2024*.*
9. **Sydney Dolan**, Victor Qin, Geoffrey Ding, Hamsa Balakrishnan, "Game-Theoretic Framework for Satellite Collision Avoidance." *AIAA/AAS Astrodynamics Specialists Conference*, 2023
10. Siddharth Nayak, Kenneth Choi, Wenqi Ding, **Sydney Dolan**, Karthik Gopalakrishnan, Hamsa Balakrishnan. "Scalable Multi-Agent Reinforcement Learning through Intelligent Information Aggregation" *Conference on Robot Learning*, Workshop on Game Theoretic Interactions 2022
11. Skylar Eiskowitz*, **Sydney Dolan** *, Kir Latyshev, George Lordos, Matthew Moraguez, Alejandro Trujillo, Bruce Cameron, Oliver de Weck, Edward Crawley. "Quantifying the Impact of Cryo-Management, ISRU, and Fuel Cell Lunar Technology Infusion to a Notional Mars LOX/LH2 Architecture." *International Astronautical Congress*, 2020.
12. Kir Latyshev, **Sydney Dolan**, Skylar Eiskowitz, George Lordos, Matthew Moraguez, Alejandro Trujilo, Bruce G. Cameron, Oliver de Weck, Edward F. Crawley. "Impact of the Lunar Gateway Location on the Human Landing System in Case of Permanent Base at the Lunar South Pole." *International Astronautical Congress*, 2020
13. **Sydney Dolan**, Skylar Eiskowitz, Edward F Crawley, Bruce G Cameron. "Comparative Benchmarking of Crewed Lunar and Mars Mission Architectures." *AIAA ASCEND*, 2020

Manuscripts in Preparation

14. **Sydney Dolan**, Siddharth Nayak, Jasmine Aloor, Hamsa Balakrishnan. "Asynchronous Cooperative Multi-Agent Reinforcement Learning with Minimal Communication." Prepared for *International Conference on Autonomous Agents and Multi-Agent Systems, 2024.*

15. Adina Golden, **Sydney Dolan**, Hamsa Balakrishnan. "satdatagen: A Python Library for Satellite Sensor Tasking Scheduler Support". Prepared for *Journal of Aerospace Information Systems*.

16. **Sydney Dolan**, Hamsa Balakrishnan. Game-Theoretic Framework for Satellite Collision Avoidance. Prepared for *Acta Astronautica*.

Invited Talks

The sections with dates are balanced on the page with talk title on the left and dates justified right

JD 12

Advancing Space Robotics: Building Intelligent Satellites for Scientific Discovery and Exploration MIT Space Enabled Research Group Talk	*July 2024*
Wait, Wait Don't Tell Me: Multi-Agent Planning with Limited Information Sharing University of Michigan Naval Architecture and Marine Engineering	*March 2024*
Leveraging Information Sharing for Satellite Navigation and Coordination Air Force Research Lab Autonomy Capability Team Spotlight Talk	*July 2023*
Safe Controllers for Satellite Collision Avoidance NASA Ames Research Branch	*August 2022*
Designing Missions to the Moon and Mars Skype A Scientist Spotlight Talk	*June 2020*

Awards and Honors

Awards and honors sections can include or be separate from fellowships and grants sections on CVs

Top Downloaded Article International Journal of Satellite Communications and Networking	*2024*
MIT Research Slam Finalist	*2024*
Future Leaders in Aerospace Selected Participant	*2023*
NextProf Nexus Workshop Selected Participant	*2023*
NASA JPL Planetary Science Summer School Selected Participant	*2023*
Communications Lab Fellow	*2022*
Outstanding Graduate Resident Advisor	*2022*
Graduate Student Outstanding Student Leadership Award	*2021*
National Science Foundation Graduate Research Fellowship	*2019*
GEM Consortium Fellow	*2019*
Douglas Fellow	*2019*
Matthew Isakowitz Fellowship Program	*2018*
Purdue Presidential Scholar	*2015*

Teaching and Mentoring

Teaching and mentoring is also an important section to have on an academic CV

JD 12

Teaching Assistant, MIT 16.8423 Fundamentals of Systems Engineering	*Fall 2020*
MIT Career and Professional Development Services Research Mentoring Certificate	*2024*
Kaufman Teaching Program Certificate	*2023*
InCITEful Citations	*2024*
How to Write a Master's Thesis	*2023/2024*
How to Organize a Research Paper	*2023*
A Guide to Video Abstracts	*2022/2024*

Professional Experience

NASA Ames, Space Traffic Management Intern — *2022*
- Designed and trained a neural Control Lyapunov Barrier Function for spacecraft collision avoidance applications

Advanced Space, Astrodynamics Intern — *2021*
- Evaluated the effects of range noise and range biases on the resultant satellite state error through the use of Monte Carlo simulations for NASA CAPSTONE Mission

The Aerospace Corporation, Astrodynamics Intern — *2020*
- Added scenarios and capabilities to HIFFLY (High-Fidelity Formation Flight), an internal tool used to model rendezvous and proximity operations

The Aerospace Corporation, Modeling and Simulation Intern — *2019*
- Created relative motion proximity operations model for a servicing vehicle to a group of cellular interoperable space rings,and evaluated structural performance of rings

Blue Origin, Advanced Development Programs Intern — *2019*
- Developed an end-to-end launch trajectory tool that connected simulation results from OTIS to the mission trajectory created in Copernicus to determine optimal launch vehicle characteristics

NanoRacks, Matthew Isakowitz Fellowship Program — *2018*
- Designed and prototyped a 1.5U NanoLab to test the effectiveness of dental fillers in space, which was flown on SpaceX CRS 16

The Aerospace Corporation, Space Architecture Intern — *2017*
- Assessed NASA GSFC projects and assisted in developing an early warning model to verify if the project would match the projections and finish on time and under budget

Selected Outreach and Service

Organizer, Queer in AI	*2024- Present*
Mentor, Women of Aeronautics and Astronautics Mentorship Program	*2024 - Present*
Graduate Student Chair, MIT AeroAstro Faculty Search Committee	*2023*
Peer Mediator, Department Resources for Easing Friction and Stress	*2022 - Present*
Committee Member, MIT AeroAstro Diversity Equity Inclusion Committee	*2021 - Present*
Executive Board, Queer Advocacy Space in AeroAstro	*2021 - Present*
Graduate Resident Advisor, MIT Sigma Kappa	*2020 - 2023*
Volunteer, Skype a Scientist	*2020 -2022*
Co-President, Graduate Women in Aerospace Engineering	*2019 – 2020*
Co-President & Founding Member, Purdue Women in Aerospace	*2017 – 2018*

Service to Field

Reviewer: IFAC Conference on Analysis and Design of Hybrid Systems, International Conference on Machine Learning, International Conference on Learning Representations, Neural Information Processing Systems, Cyber Physical Systems Week

Workshop Organizer: *CoCoMARL: Coordination and Cooperation for Multi-Agent Reinforcement Learning,* Reinforcement Learning Conference

American Institute of Aeronautics and Astronautics

Institute of Electrical and Electronics Engineers