Shu-Yu (Michelle) Lin

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Education

Graduate Student — **Massachusetts Institute of Technology** *Aeronautics & Astronautics*
NSF, NSTGRO, & Jack and Vickie Kerrebrock Fellow
Space architecture and bioastronautics research in the Human Systems Lab (Arquilla)
Overall GPA: 4.00 **Major GPA: 4.00**

Bachelor's — University of Colorado Boulder *Aerospace Engineering Sciences & Applied Mathematics*
Overall GPA: 3.98 GPA: 4.00 (App. Math) | 3.94 (Aerospace) **Summa Cum Laude**

Experience

May - Aug 2022 — **Medical Operations Engineer** at SpaceX — Hawthorne, CA
- Managed over 40 research proposals to be selected for a customer mission
- Created rubric for research feasibility, presented summaries of research projects to customer
- Owned training and data collection scheduling for over 30 research payloads
- Led flight hardware hazard assessment for over 25 research projects, totaling to over 100 parts
- Communicated with the Polaris Dawn Program, 20 researchers, and 10+ internal engineers on 30+ time-sensitive projects
- Owned crew training for internal research project
- Supported and debriefed the internal medical team over a two-day crew medical and research skills training campaign
- Created behavioral health EVA simulation

Current — **Human Factors Consultant** at Astrolab — Hawthorne, CA
- Provided a rover capability and ergonomics analysis after a desert field test
- Serve as human factors and human spaceflight expert for company-wide engineering team leads

May - Aug 2020 — **Space Architecture Intern** at Blue Origin — Kent, WA
Matthew Isakowitz Fellowship Program
- Supported the Human Spaceflight Portfolio in Advanced Technology and habitat concept work in Advanced Concepts.
- Compiled a reference guide on human-occupied spaces, architecture, ECLSS, and human interactions
- Produced a holistic design for human habitation that integrated engineering systems and architecture
- Coordinated design decisions with input from engineers, architects, astronauts, and the user experience team

May - Aug 2019 — **Vehicle Engineering Intern** at SpaceX — Hawthorne, CA
Brooke Owens Fellowship Program
- Responsibilities included analyzing structures and mechanisms for existing spacecraft, improving designs, and working on independent projects.
- Completed a variety of mechanical design projects, mainly component design, fabrication, kinematic modeling, and testing.
- Led and completed software, electrical, and structural design for portable testing box.
- Developed several software processes to analyze test data, improved efficiency by more than 75%.

Aug 2020 - May 2021 — **Structures and Mechanisms Lead** for CU Bioastronautics Lab Sponsored Project — Boulder, CO
Multi-Sensory Cueing System for Remote Flight Simulations
- Lead a structures and mechanisms team of 4 people, working in a larger team of 12 as part of the senior design project
- Produced novel system that couples vestibular and tactile cueing to simulate flight experience for remote pilots

Research

Fall 2021 - Spring 2022 — **Physical Instinct in Microgravity**
- Studying physical instinct of movement fluidity in microgravity through parabolic flights.
- Prototyped a wearable sensor system capturing kinematic motion at 12 joints
- Mentored a UROP through an electronics prototyping project for IAP (MIT's January term)

Spring 2020 - Spring 2021 — **Adaptive Architecture in Intelligent Spacecraft Habitats**
- Focused on adaptive architecture as part of NASA's Habitats Optimized for Missions of Exploration (HOME) Project.
- Research thrust liaison to Howard University for space architecture work, collaborated biweekly to provide advice and guidance on architecture research.

2018-2019 — **Alternative Reality Technologies in Spacecraft Habitat Design Evaluation**
- Led software development to produce an augmented reality environment through the Microsoft Hololens
- Aided in human subject experiments, assessing system usability and communicating results to a scientific audience
- Continued this research in a collaborative project with Johnson Space Center to develop advanced decision support tools to increase crew autonomy.

Papers

Shu-Yu Lin, A. Yang, and K. Arquilla. "Prototyping Wearable Sensor Garment for Understanding Proprioceptive Changes in Microgravity." International Astronautical Congress. September 2022.
Shu-Yu Lin, K. Arquilla. "Quantifying Proprioceptive Experience in Microgravity." Space CHI Workshop, Association for Computing Machinery Conference on Human Factors in Computing. May 2022.
N. Banerjee, A. Baughman, **S. Lin**, Z. Witte, D. Klaus, A. Anderson. "Development of Alternative Reality Environments for Spacecraft Habitat Design Evaluation." Virtual Reality, 1-10. July 2020.
N. Banerjee, A. Baughman, **S. Lin**, Z. Witte, D. Klaus, A. Anderson. "Side-by-Side Comparison of Human Perception and Performance in Augmented, Hybrid, and Virtual Reality." IEEE Transactions on Visualization and Computer Graphics. July 202.

Leadership and Awards

2022-2023 | Graduate Resident Advisor at MIT, East Campus Dormitory
- Fostering community, providing mentorship, and promoting healthy living for MIT undergraduates

2022 | Receipient of the AIAA Neil A. Armstrong Graduate Award

September 2022 | Panelist at NextGen Plenary Panel
- One of five panelists on a highly-selective IAC NextGen Plenary Panel, "Space and the Arts"

2021-2022 | Outreach and Diversity Chair of MIT Graduate Association for Aeronautics and Astronautics
- Leading equity and inclusion efforts for the graduate student association within MIT AeroAstro
- Organize topics and speakers monthly Community Awareness Lunch and Learn events

2021 | Instructor at Cascade, SPARK, SPLASH, MIT Educational Studies Program
- Designed and taught a 5-week seminar on living in space for low-income high schoolers
- Designed and taught two-hour courses titled "How to be an Astronaut" for middle schoolers

2021 | CU College of Engineering and Applied Sciences Research Award and JEDI (Justice, Equity, Diversity, and Inclusion) Award Recipient

2019-2020 | President and Founder of Women of Aeronautics and Astronautics, CU Boulder Chapter
- Provided direction and leadership to an executive board of seven members and an organization of over 150 students.
- Created inclusive and positive community geared towards gender minorities across all majors to engage in their interests in space through professional development.

2019 - 2020 | Recipient of the Women in Aerospace Foundation Scholarship

2020 | Recipient of Aviation Week and AIAA's "Tomorrow's Technology Leaders: The 20 Twenties"

2019-2020 | Mentor for Womxn of Color Program, Broadening Opportunities through Leadership and Diversity

Skills & Affiliations

MATLAB, Python, Mathematica, NX, Solidworks, Rhino 6, STK, GD&T
PADI Open Water Certification, SSI Advanced Adventurer Certification, AIDA II Freediving Certification
Fluent in Mandarin and English, proficient in Spanish

AIAA member, SWE member