

Mich (Shu-Yu) Lin, M.S.

Ph.D. Candidate, Department of Aeronautics and Astronautics

E: shuyulin@mit.edu

LinkedIn: [linkedin.com/in/mlin920](https://www.linkedin.com/in/mlin920)

Portfolio: mich.cargo.site

Massachusetts Institute of Technology

Research Interests

Human spaceflight, human-environment relationship, isolated/confined/extreme environments, behavioral health, space psychology, sleep science, teams in complex operational environments, behavioral design in architecture, post-occupancy evaluation, user-centered design

Education

Ph.D., Space Architecture, Massachusetts Institute of Technology, exp. Dec. 2026

Thesis: *Architectural Design Framework for Passive Behavioral Health Risk Mitigation in Austere Environments*

Committee: Prof. Olivier de Weck (chair); Prof. Katya Arquilla; Dr. Lauren Landon

GPA: 5.00/5.00

M.S., Aeronautics and Astronautics, Massachusetts Institute of Technology, June 2023

Thesis: *Wearable Sensor System for Quantifying Proprioceptive Competence in Microgravity* [10]

Advisors: Prof. Jeffrey Hoffman; Prof. Katya Arquilla

GPA: 5.00/5.00

B.S., Aerospace Engineering Sciences, University of Colorado Boulder, June 2021

Summa cum laude, with honors, GPA: 3.94/4.00

B.S., Applied Mathematics, University of Colorado Boulder, June 2021

Summa cum laude, with honors, GPA: 4.00/4.00

Selected Publications

Shu-Yu Lin, Lauren Landon, Katya Arquilla. "Impact of Habitability on Behavioral Health and Performance in Isolation & Confinement". *In preparation*.

Shu-Yu Lin. "Wearable Sensor System for Quantifying Proprioceptive Competence in Microgravity" Master's Thesis. Massachusetts Institute of Technology. 06/2023.

Research and Professional Experience

NASA Ames Research Center - Fatigue Countermeasures Lab, Mountain View, CA; Researcher	Su. 2025
---	----------

Analyzed participant data to examine the effect of pink noise on sleep and perception
Supported sleep deprivation experiments

3XN/GXN, Copenhagen, Denmark; Behavioral Designer & Researcher	Su. 2024
--	----------

Conducted post-occupancy evaluations to assess affordances
Created behavioral design brief for masterplan project
Contributed to and edited chapter on blending research and practice [8]

NASA Johnson Space Center - Behavioral Health & Performance Lab, Houston, TX; Researcher	Su. 2023
---	----------

Analyzed participant data from NASA's analog isolation habitat studies
to quantify the correlation between habitability and mood [3][11]

SpaceX – Operations, Hawthorne, CA; Space Medicine & Research Engineer	Su. 2022
--	----------

Led flight hardware hazard assessment for over 25 research projects

Astrolab – Field Test, Dumont Dunes, CA; Human Factors Consultant	Su. 2021
---	----------

Provided human factors & ergonomics assessment for lunar rover

Blue Origin – Advanced Concepts, Kent, WA; Space Architecture Intern <i>Modeled and rendered a human habitation design in microgravity with Rhino and VRay</i>	Su. 2020
SpaceX – Vehicle Engineering, Hawthorne, CA; Mechanisms Intern <i>Designed and fabricated flight parts for Demo-II and Crew-1</i> <i>Designed portable actuation box for docking mechanism</i>	Su. 2019
CU Bioastronautics Lab, Boulder, CO; Researcher <i>Led software development in Unreal and Blendr to produce an augmented reality environment through the Microsoft HoloLens [1][2]</i>	2019-2021
Colorado Legislature, Denver, CO; Science & Engineering Policy Fellow <i>User research on renewable energy in rural communities</i>	Su. 2018
Colorado Space Grant, Boulder, CO; Systems Engineering Lead <i>Managed schedules and requirements for inflatable habitat model</i>	2017-2018

Grants and Fellowships

Richard Dupont Memeorial Fellowship (MIT)	2024
MISTI International Travel Support (MIT)	2024
NASA Space Technology Graduate Research Fellowship <i>Award: Architectural Design Framework for Providing Passive Behavioral Health Risk Countermeasures</i>	2022
Graduate Student Council Conference Travel Grant (MIT)	2021
National Science Foundation Graduate Research Fellowship	2021
Jack and Vickie Kerrebrock Fellowship	2021
John B. Cox '48 Endowed Scholarship (CU Boulder)	2020
J. Tour Scholarship in Arts and Sciences (CU Boulder)	2020
Rudolph and Helen Gagg Scholarship (CU Boulder)	2019
Dorothy Martin Endowment Fund (CU Boulder)	2018
Quarton Scholar (CU Boulder)	2018-2021
Ball Aerospace Broadening Opportunities through Leadership and Diversity Scholarship (CU Boulder)	2018-2021
Esteemed Scholars Award (CU Boulder)	2017-2021
Engineering Scholarship (CU Boulder)	2017-2021
Greenhouse Scholarship	2017-2021

Peer Reviewed Publications

1. **Mich Shu-Yu Lin** and Katya Arquilla. "Fluidity as a Measure of Movement Quality." In Proceedings of the 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society: Copenhagen, Denmark. 07/2025.
2. Banerjee, N., Baughman, A., **Lin, S.**, Witte, Z., Klaus, D., Anderson, A. "Development of Alternative Reality Environments for Spacecraft Habitat Design Evaluation." Virtual Reality, 1-10. 07/2020.
3. Banerjee, N., Baughman, A., **Lin, S.**, Witte, Z., Klaus, D., Anderson, A. "Side-by-Side Comparison of Human Perception and Performance in Augmented, Hybrid, and Virtual Reality." IEEE Transactions on Visualization and Computer Graphics. 07/2020.

Under revision, review, or preparation

4. **Shu-Yu Lin**, Landon, L., Arquilla, K. "Impact of Habitability on Behavioral Health and Performance in Isolation & Confinement". *In preparation*.

Conference Publications

5. **Shu-Yu Lin**, Chen, L., Landon, L., Arquilla, K. "Acyclic framework for identifying causal relationships in habitat design." International Astronautical Congress, Milan, Italy, 10/2024.
6. **Shu-Yu Lin**, Yang, A., Arquilla, K. "Prototyping Wearable Sensor Garment for Understanding Proprioceptive Changes in Microgravity." International Astronautical Congress, Paris, France, 09/2022.
7. **Shu-Yu Lin**, Yang, A., Arquilla, K. "Quantifying Proprioceptive Experience in Microgravity." SpaceCHI Workshop at ACM Computer Human Interaction. New Orleans, LA, 05/2022.

Other Publications

8. Bell, S.T., Dev, S.I., Landon, L.B., Miller, J.C.W., Anderson, S.R., Flynn-Evans, E., Spencer, C.A., **Lin, S.Y.**, Khader, A. Human Factors and Behavioral Performance Exploration Measures in HERA Campaign 6: Final Report. Internal report submitted to the Human Factors and Behavioral Performance Element, NASA Human Research Program. Houston, TX: NASA Johnson Space Center. 09/2024.
9. **Shu-Yu Lin**. "Wearable Sensor System for Quantifying Proprioceptive Competence in Microgravity" Master's Thesis. Massachusetts Institute of Technology. 06/2023.

Presentations and Posters

10. **Shu-Yu Lin**, K. Arquilla, D. Garcia, L. Landon, and O. de Weck. "Architecture in Extreme Environments: A Site-Specific Case Study for Space Architecture." NASA Human Research Program Investigators Workshop. Galveston, TX. 01/2025. (Poster)
11. **Shu-Yu Lin**, L. Landon, K. Arquilla. "Factors Impacting Habitability: Analysis of SHAQ Data from HERA C5 & C6." NASA Human Research Program Investigators Workshop. Galveston, TX. 01/2024. (Presentation)
12. **Shu-Yu Lin**, R. Howard, K. Arquilla. "Exploration of Place-Making in Space Architecture for Behavioral and Psychological Health." NASA Human Research Program Investigators Workshop. Galveston, TX. 01/2022. (Poster)
13. Banerjee N., Baughman A., **Lin S.**, Witte Z., Klaus D., Anderson A. "Development of Alternative Reality Environments for Spacecraft Habitat Design Evaluation" NASA Human Research Program Investigators Workshop. Galveston, TX. 01/2019. (Poster)

Teaching Experience

Guest lecturer, 16.470 Experimental Statistics	Sp. 2025
Instructor, 16.459: Bioastronautics Journal Seminar. MIT	Fa. 2023 — Sp. 2025
Co-Instructors: Prof. Charles Oman, Dr. Andrew Liu	
Guest lecturer, Masters in Architecture and Extreme Environments.	October 2024
Royal Danish Academy	
Kaufman Teaching Certificate Program. MIT	Fa. 2022
Lecturer, Educational Students Program. MIT	2021-2022
Guest Lecturer, National Central University, Taiwan	January 2021
Recitation Leader EHON 1151: Critical Encounters. CU Boulder	Fa. 2018, 2019

Student Research Advising

Yutian He
Crystal (Crys) Yang (Undergraduate Research Opportunity Program)
Yihong (Amy) Chen (UROP)
Claire Chen (UROP) [5]
Caitlin Lian (UROP) [4]

Anna Yang (UROP) [4][7]
Kara Chou (UROP)

Honors and Awards

Arts Scholar (MIT)	2024
AIAA Neil Armstrong Award	2022
Graduate Award in Research (CU Boulder)	2021
Graduate Award in Justice, Equity, Diversity, and Inclusion (CU Boulder)	2021
Matthew Isakowitz Fellowship	2020
Aviation Week / AIAA Tomorrow's Technology Leaders: The 20 Twenties	2020
Brooke Owens Fellowship	2019
Women in Aerospace Foundation Scholarship in memory of Molly K. Macauley	2019
Dean's List (CU Boulder)	2017-2021

Outreach, Service, and Community Involvement

Critic, Landscape Architecture Final Pin-Up, Chung Yuan Christian University	Sp. 2025
Graduate Faculty Search Committee (MIT)	2025
Reviewer, AIAA ASCEND Humans In Space Technical Committee	2025
Mentor, K-12 Fashion Workshop, Morningside Academy of Design (MIT)	2024
Director of Runway, MIT GALA Led selection, runway training, and scheduling for student models	
Mentor, Glass & Framework Makerspaces (MIT)	2023
Board member, Flipping Failure Initiative (MIT)	2022-2023
Organizer, Multicultural Conference, Office of Intercultural Engagement (MIT)	2022-2024
Lecturer, Living in Space. Educational Studies Program (MIT) <i>Developed for grade school students</i>	Sp. 2022
Alumni mentor, Brooke Owens Fellowship Program	2021, 2023
Outreach & Diversity Chair, Graduate AeroAstro Association (MIT)	2021-2022
Advocate, DC Science Policy Day (MIT)	2022
Lecturer, How to be an Astronaut. Educational Studies Program (MIT) <i>Developed for grade school students</i>	Fa. 2021
Summit conference organizer, Brooke Owens Fellowship Program	2020
Undergraduate Representative, Inclusive Culture Committee Working Group Aerospace Engineering Sciences (CU Boulder)	2020
Mentor, CEAS Access & Inclusion Mentorship Program (CU Boulder)	2020-2021
Founder and President, CU Women of Aeronautics & Astronautics	2019-2021
Founder, CU Science Policy Initiative	2019
Mentor, Womxn of Color Program, Broadening Opportunities through Leadership and Diversity (CU Boulder)	2019-2020

Speaking Appearances

Speaker, Space Week, Boston Museum of Science	Apr. 2025
Panelist, Complex Adaptive Systems conference (IEEE, INCOSE)	Mar. 2025
Seminar speaker, CU Bioastronautics Seminar	Feb. 2025
Panelist, IAF NextGen Plenary "Arts in Space"	Sep. 2022
Podcast speaker, Ignited Thinkers	2022
Podcast speaker, "An Aspiring Explorer Navigates a Changing Space Industry" Supercluster	2020
Panelist, Terranaut Club Nova Scotia	2020
Panelist, Designing for Mars Camp, Taliesin West of the Frank Lloyd Wright Foundation	2020

Keynote Speaker, Society of Women Engineers
Interviewed for local news on bioastronautics research at CU Boulder

Skills and Softwares

Research

Data Analysis (R, Matlab, Python, Atlas.ti), literature review (Zotero, Mendeley), experimental & statistical design, non-parametric statistics, publication and grant writing

Design and fabrication

Computer-aided 3D/2D drawing (Rhino, NX, AutoCad), human factors and ergonomics analysis, microelectronics, soldering, machine and hand sewing, mill and lathe, film processing, geometric dimensioning and tolerancing, glass framework and lampwork

Project management

Gantt milestone tracking, selection criteria development, communicative, self-starter, detail-oriented

Additional Certifications and Experience

1. SCUBA – PADI Open Water, SSI Advanced Open Water
2. Freediving – AIDA II
3. Parabolic flight experience – Completed 25 total parabolas. 2022 Campaign, 1 day
4. Coxswain, MIT Rowing Club
5. First Responder Training – Medical CPR
6. Institutional Review Board – Biomedical Research Investigators (exp. 02/2029)
7. TIPS Certification (Massachusetts)
8. Languages: English (native), Mandarin Chinese (native), Taiwanese (basic), Spanish (proficient), German (basic)