

# Sophia Wang

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## EDUCATION

### Massachusetts Institute of Technology (MIT), Class of 2024

Cambridge, MA

- B.S. in Aerospace Engineering, GPA: 4.8/5.0

## RESEARCH AND ENGINEERING

### Fab Foundation, MIT International Science and Technology Initiatives

Worldwide

Digital Fabrication Global Ambassador

September 2024 – September 2025

- Investigating educational, economic, social models across global makerspaces for monograph and comparative study at FABx
- Supported by MISTI as the first cross-continental student innovation ambassador in the program's 40-year history
- Notable residencies include: Huaqiangbei in Shenzhen, China (electronics manufacturing), Thimphu, Bhutan Super Fablab (material circularity), Amazon Floating Fablab (biodiversity platform), Amsterdam WAAG Future Lab (digital methods for arts preservation)

### MIT Media Lab: Center for Bits and Atoms (CBA), Prof. Neil Gershenfeld

Cambridge, MA

Project Lead, Demonstrating Robotic Self-Assembly and Self-Replication in Aerospace Applications

February 2023 – June 2024

- Developed modular quadcopter with automated assembly and custom flight controller library with scalable dimensionality
- Performed tethered and in-flight testing to profile drone load and drag performance and assembly time, cost, and power
- Fabricated embedded force sensors with Toyota Research Center for selective load placement during assembly
- (separate project) Developed and launched Voxel Invention Kit to create construction-scale, electromechanical unit cells; Contributed to NASA NIAC proposal for voxelized Starshade construction, the first demonstration of self-assembly in space

### MIT Media Lab: Tangible Media Group (TMG), Prof. Hiroshi Ishii

Cambridge, MA

Project Co-Lead, Methods and Applications of 4D Printing, from artificial grafts to pneumatic devices.

June 2023 – June 2024

- Designed, built, and characterized a 4D printer for the continuous extrusion of photoresponsive liquid crystalline elastomers (LCE)
- Developed a library of actuation primitives for soft-robotic structures and wearables capable of noncontact manipulation
- Achieved multi-stimulus, free-standing laser-induced graphene/LCE composites with electrothermal and photoresponsive methods

### NASA Jet Propulsion Laboratory (JPL)

Pasadena, CA

Payload and Small Spacecraft Mechanical Engineering Intern, Mars Perseverance Sample Return Mission

June 2022 – August 2022

- Designed heat seal circuits and containment units for in-vacuum testing to eliminate contamination of samples in space capsule
- Successfully tested heat seal with on-site five-story drop tower used to simulate re-entry into Earth's atmosphere
- Implemented gear computation tool to determine transverse and fundamental bending stress and pitting resistance

### MIT Space Telecommunications Astronomy Radiation (STAR) Lab, Prof. Kerri Cahoy

Cambridge, MA

Undergraduate Researcher, Direct Imaging of Exoplanets in search of life-supporting Earth analogs

August 2020 – August 2022

- Commanded satellite overpasses for DeMi, a flagship deformable-mirror imaging satellite, launched in Northrop Grumman Cygnus
- Validated trajectory matching algorithm to "deconfuse" multi-planet systems detected in direct imaging using 100,000+ samples
- Developed and implemented algorithm to measure predictive distance from true-positive detections of planets
- (separate project) Designed circuits to thermally modulate the Portable Telescope for Lasercom (PorTeL) ground station

### Sinkhole Detection and Prediction

Woodbridge, CT

Project Director, Chief Engineer

September 2016 – September 2020

- Engineered a novel real-time sinkhole detection and prediction system with 93% testing accuracy at less than 5% of the current cost
- Developed (Structural Monitoring, Machine Learning based) sensing device used in generation of time/location predictions
- Led field studies and land surveys of sinkhole sites, in collaboration with EPA, USGS, and University of Connecticut (UConn)
- Secured \$20,000+ in project funding and filed for Utility Patent in May 2020 as UConn IP Law Clinic Pro-Bono Patent Recipient

Other affiliations: **Facebook (2021):** iOS Intern. **Columbia Poromechanics Laboratory (2019-2020):** US. Army Research Intern

## TEACHING

### MIT Spokes

U.S.A

Teacher and Cyclist

June 2024 – August 2024

- Cycled 4,037 miles and climbed 171,691 feet of elevation across America in 75 days, stopping in rural towns to run learning festivals
- Taught over 200 students across seven juvenile correctional facilities, libraries, museums, and after-school clubs
- Developed open-source digital fabrication and 3D printing workshops, concurrently teaching 75 students virtually in a 2-week camp

### MIT Eurasia, Global Teaching Labs (GTL)

Almaty, Kazakhstan

Math, Science, and Engineering Teacher at Haileybury Almaty

January 2024 – February 2024

- Developed and taught Space Systems Engineering course for 300+ students in grades 7-9, emphasizing hands-on learning with telescope construction kits, laser communication demonstrations, Mars Landing build challenges, and single-rotor helicopter flights

- Led school-wide assemblies before 500 students, gave research talks, and ran after-school engineering competitions

### MIT Germany, Global Teaching Labs (GTL)

English and Science Teacher at Leibniz Gymnasium

Essen, Germany

January 2023 – February 2023

- Taught grades 9-12 physics and engineering, supplementing curriculum with school-wide robotics demos and research talks
- Ran debate seminars for English and Government classes, covering topics including welfare, bioethics, and freedom of speech

### Amity Science Mentorship Program

Program Lead

Woodbridge, CT

June 2018 – June 2019

- Taught 30-student sixth grade water science classes at Bethany Community School, with end of the term trips to a local stream to collect and test water samples and present findings in a report to the Woodbridge Town Hall
- Collaborated with teachers and administrators to secure funding for weekly bus services and classroom laboratory space

## COOKING

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### Mince

Creator and Head Chef

Cambridge, MA

September 2022 – June 2024

- Served over 2,500 guests with over 10,000 people on the waiting list, with tickets to dining events chosen by lottery
- Crafted dining experiences in two formats: a formal pop-up, 5-course tasting menu priced at \$17 with seatings for 30 – 60 guests, and pop-downs, à la carte casual dining through food trucks, stands, and picnics for anywhere between 250 – 600 guests
- Ran a 25-person team responsible for all creative and business tasks, from menu design to recipe development to seating charts
- Invited to dine with and learn from Tracy Chang (Chef/Owner of Pagu, a James Beard nominated restaurant), Eneko Atxa (Head Chef of 3-Michelin Star restaurant Azurmendi), and Joxe Mari Aizega (General Manager of the Basque Culinary Center)

### Bone Kettle

Line Cook

Pasadena, CA

June 2022 – August 2022

- Prepped for and co-ran the small plates station, serving ~300 guests a night with ~600 dishes daily from my station
- Butchered meats for all stations, prepared family meal for staff before service, and cleaned the kitchen at the end of every shift
- Rotated across stations, from the garde mangier where I shucked oysters and plated desserts, to the grill where I seared Wagyu

### Yume Wo Katare

Host

Cambridge, MA

June 2023 – December 2023

- Facilitated more than 1,000 dreams. *Yume Wo Katare* means *Talk about your dream*. As host, when each customer reaches the end of their bowl of Tonkotsu pork ramen, I ask them to share a yet unfulfilled dream before a full seating of 18-people, intent on listening.
- Served ramen and set the seating pace for ~150 guests nightly, prepped stock and toppings, and cleaned dining area and kitchen

## AWARDS

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International: **Ms. Monopoly** (2019): Chosen globally as one of three young female inventors to be featured in Ms. Monopoly campaign docuseries, awarded \$20,580 in funding through Hasbro, Inc. Innovation Grant for sinkhole detection/prediction project. **Intel ISEF**: 1st in Earth and Environmental Sciences (EAEV) and 2nd Award from Geological Society of America (2019); 3rd in EAEV, 1st in EAEV from Air Force Laboratory, and 3rd in Experimental Mechanics from Society of Exp. Mechanics (2018). **Tsinghua Summer Fellowship** (2024)

National: **Coca Cola Scholar** (2020) **Regeneron STS Scholar** (2020) **Citizens Scholar** (community merit scholarship) (2020) **Milton Fisher Scholar** (creativity in STEM scholarship) (2019) **National Invention Convention**, 1st in Grade (2019)

Grants: **Jameel World Education Lab (J-WEL) Innovation Grant** (2024) **MIT pk12 Open Learning Grant** (2024) **MIT Council for the Arts Seed Grant** (2023-2024) **MIT Sandbox Innovation Fund** (2020-2022)

## PUBLICATIONS AND PATENTS

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Sophia Wang, Miana Smith, and Neil Gershenfeld. 2023. Voxelcopter: Modular Autonomous Aerial Systems. In Proceedings of the 8th ACM Symposium on Computational Fabrication (SCF '23). Association for Computing Machinery, New York, NY, USA, Article 18, 1–2. <https://doi.org/10.1145/3623263.3629155>

Rhonda Morgan, Sophia K. Vlahakis, Leonid Pogorelyuk, Jenny Gubner, Riley Fitzgerald, Sophia Wang, Kerri Cahoy, "Planet matching and orbit determination in multi-planet systems for exoplanet direct imaging," Proc. SPIE 11823, Techniques and Instrumentation for Detection of Exoplanets X, 118230F (3 September 2021); <https://doi.org/10.1117/12.2594998>

Wang, Sophia. 2020. System, method, and device for real-time sinkhole detection. US Patent 20210109248A1, filed May 7, 2020, and published April 15, 2021.

(submitted, in-progress) Miana Smith, Jack Forman, Amira Abdel Rahman, Sophia Wang, and Neil Gershenfeld, Voxel Invention Kit: Reconfigurable building blocks for interactive structural electromechanical systems. In Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems.