Danli Luo

E-mail: danlil@uw.edu
Portfolio: danli-luo.com

Research Interests

My research draws from **physical intelligence**, **human–computer interaction**, and **bio-inspired design** to create programmable materials, self-evolving fabrication platforms, and autonomous laboratory systems that enable more adaptive and accessible scientific inquiry.

Education

University of Washington, Seattle, WA — 2021 - present
Ph.D, Human-Centered Design & Engineering
Advisor: Nadya Peek

Carnegie Mellon University, Pittsburgh, PA — 2015 - 2017
M.S., Materials Science & Engineering

Imperial College, London, UK — 2010 - 2013
B.Eng., Materials Science & Engineering

Professional Experience

Accenture Labs, Seattle, WA — Jun - Sep 2024
Technology R&D Associate Research Principal
Mentors: Wade Ingram, Andreea Danielescu

Human-Computer Interaction Institute, CMU, Pittsburgh, PA — 2018 - 2021
Research Associate
Mentor: Lining Yao

Honors and Awards

MIT Technology Review 35 Innovators Under 35 — 2024
Heidelberg Laureate Forum Young Researcher — 2024
Fast Company's World Changing Ideas Honorable Mention — 2024

Selected Journal Publications

1. **Danli Luo**, Aditi Maheshwari, Andreea Danielescu, Jiaji Li, Yue Yang, Ye Tao, Lingyun Sun, Dinesh K. Patel, Guanyun Wang, Shu Yang, Teng Zhang, Lining Yao. Autonomous self-burying seed carriers for aerial seeding. *Nature* **614**, 463–470 (2023). **Cover Story**.
2. **Danli Luo**, Junchao Yang, Nadya Peek. 3D-Printed Mycelium Biocomposites: Method for 3D Printing and Growing Fungi-Based Composites. *3D Printing and Additive Manufacturing* **12**, 98–111 (2025).
3. **Danli Luo**, Chao Zhao, Guanyang Xue, Zhibo Cao, Alparslan Oztekin, Xuanhong Cheng. Label-free focusing of viral particles under a temperature gradient coupled with continuous swirling flow. *RSC Advances* **12**, 4263–4275 (2022).
4. Ye Tao, Yi-Chin Lee, Haolin Liu, Xiaoxiao Zhang, Jianxun Cui, Catherine Mondoa, Mahnoush Babaei, Jasio Santillan, Guanyun Wang, **Danli Luo**, et al. Morphing pasta and beyond. *Science Advances* **7**, eabf4098 (2021). **Cover Story**.

Selected Conference Publications

5. **Danli Luo**, Wade Ingram, Andreea Danielescu. From Piping to Printing: An Action-Based Approach to Computational Food Fabrication. *Proceedings of the 20th International Conference on Tangible, Embedded, and Embodied Interaction (TEI '26)* (2026), 1–13.
6. **Danli Luo**, Daniela Rosner, Nadya Peek. Doufu, Rice Wine, and 面饼: Supporting the Connections between Precision and Cultural Knowledge in Cooking. *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (2023), Article 475, 1–13.
7. **Danli Luo**, Jianzhe Gu, Fang Qin, Guanyun Wang, Lining Yao. E-seed: Shape-changing interfaces that self drill. *Proceedings of the 33rd Annual ACM Symposium on User Interface Software and Technology* (2020), 45–57.

Other Publications

8. Guanyun Wang, Yue Yang, Mengyan Guo, Kuangqi Zhu, Zihan Yan, Qiang Cui, Zihong Zhou, Junzhe Ji, Jiaji Li, **Danli Luo**, Deying Pan, Yitao Fan, Teng Han, Ye Tao, Lingyun Sun. ThermoFit: thermoforming smart orthoses via metamaterial structures for body-fitting and component-adjusting. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* (IMWUT) 7.1 (2023) 1–27.
9. Humphrey Yang, **Danli Luo**, Kuanren Qian, Lining Yao. Freeform fabrication of fluidic edible materials. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (2021), Article 620, 1–10.
10. Lingyun Sun, Yue Yang, Yu Chen, Jiaji Li, **Danli Luo**, Haolin Liu, Lining Yao, Ye Tao, Guanyun Wang. ShrinCage: 4D Printing Accessories that Self-Adapt. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (2021), Article 432, 1–12.
11. Lingyun Sun, Jiaji Li, Yu Chen, Yue Yang, Zhi Yu, **Danli Luo**, Jianzhe Gu, Lining Yao, Ye Tao, Guanyun Wang. FlexTruss: A Computational Threading Method for Multi-material, Multi-form and Multi-use Prototyping. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (2021), 1–12.
12. Jianzhe Gu, Vidya Narayanan, Guanyun Wang, **Danli Luo**, Harshika Jain, Kexin Lu, Fang Qin, Sijia Wang, James McCann, Lining Yao. Inverse design tool for asymmetrical self-rising surfaces with color texture. *Proceedings of the 5th Annual ACM Symposium on Computational Fabrication* (2020), Article 14, 1–12.
13. Yuxuan Yu, Haolin Liu, Kuanren Qian, Humphrey Yang, Matthew McGehee, Jianzhe Gu, **Danli Luo**, Lining Yao, Yongjie Jessica Zhang. Thermoplastic Fiber Reinforced Composite Material Characterization and Precise Finite Element Analysis for 4D Printing. *Computer-Aided Design* **122**, 102817 (2020).
14. Yepin Zhao, Zongyu Wang, Rui Yuan, Yu Lin, Jiajun Yan, Jianan Zhang, Zhao Lu, **Danli Luo**, Joanna Pietrasik, Michael R Bockstaller, Krzysztof Matyjaszewski. ZnO/carbon hybrids derived from polymer nanocomposite precursor materials for pseudocapacitor electrodes with high cycling stability. *Polymer* **137**, 370–377 (2018).
15. Jianan Zhang, Yang Song, Yepin Zhao, Shuo Zhao, Jiajun Yan, Jaejun Lee, Zongyu Wang, Siyuan Liu, Rui Yuan, **Danli Luo**, et al. Organosilica with grafted polyacrylonitrile brushes for high surface area nitrogen-enriched nanoporous carbons. *Chemistry of Materials* **30**, 2208–2212 (2018).

16. Thomas Martin Reidy, **Danli Luo**, Priyokti Rana, Brenden Huegel, Xuanhong Cheng. Transparency of PDMS based microfluidic devices under temperature gradients. *Journal of Micromechanics and Microengineering* **29**, 015014 (2018).
17. Jianan Zhang, Rui Yuan, Sittichai Natesakhawat, Zongyu Wang, Yepin Zhao, Jiajun Yan, Siyuan Liu, Jaejun Lee, **Danli Luo**, Eric Gottlieb, Tomasz Kowalewski, Michael R Bockstaller, Krzysztof Matyjaszewski. Individual nanoporous carbon spheres with high nitrogen content from polyacrylonitrile nanoparticles with sacrificial protective layers. *ACS Applied Materials & Interfaces* **9**, 37804–37812 (2017).
18. Zongyu Wang, Siyuan Liu, Jianan Zhang, Jiajun Yan, Yepin Zhao, Clare Mahoney, Rachel Ferebee, **Danli Luo**, Joanna Pietrasik, Michael R Bockstaller, Krzysztof Matyjaszewski. Photocatalytic active mesoporous carbon/ZnO hybrid materials from block copolymer tethered ZnO nanocrystals. *Langmuir* **33**, 12276–12284 (2017).
19. Zongyu Wang, Zhao Lu, Clare Mahoney, Jiajun Yan, Rachel Ferebee, **Danli Luo**, Krzysztof Matyjaszewski, Michael R Bockstaller. Transparent and high refractive index thermoplastic polymer glasses using evaporative ligand exchange of hybrid particle fillers. *ACS Applied Materials & Interfaces* **9**, 7515–7522 (2017).
20. Jianan Zhang, Jaejun Lee, Zongyu Wang, Jiajun Yan, Zhao Lu, Siyuan Liu, **Danli Luo**, Krzysztof Matyjaszewski, Michael R Bockstaller. Synthesis and characterization of gibbsite nanoplatelet brushes by surface-initiated atom transfer radical polymerization. *Polymer* **126**, 126–132 (2017).
21. Zongyu Wang, Clare Mahoney, Jiajun Yan, Zhao Lu, Rachel Ferebee, **Danli Luo**, Michael R Bockstaller, Krzysztof Matyjaszewski. Preparation of well-defined poly (styrene-co-acrylonitrile)/ZnO hybrid nanoparticles by an efficient ligand exchange strategy. *Langmuir* **32**, 13207–13213 (2016).

GRANTED PATENTS

Lining Yao, **Danli Luo**, Jianzhe Gu, Fang Qin, Guanyun Wang
Methods and devices for biomimetic hygromorphic composite.
US Patent App. US 2022/0322599 A1

PUBLIC EXHIBITIONS

E-seed	
Garden Futures, Vitra Museum and V&A Dundee in UK	2025
EAT: Transformative Seeds, Singapore Design Week	2025
13th Biennale Internationale Design Saint-Étienne, France	2025
London Design Biennale	2023
ThermoWear	
Prototypes of Humanity, Responsive bio-skins	2022

INVITED TALKS

Olympic Peninsula Fungi Festival	
Coffee, Fungi, and the Future of Stuff	2025
Are You Smarter Than A Commedian?	
Coffee, Fungi, and the Future of Stuff	2025

SELECTED PRESS

Nature Cover Story Gone to earth

Research Highlight, Nature Biotechnology Plant-inspired design of self-burying seed carrier

Wall Street Journal Five farming technologies tackle climate change threats

CNN Powered by rain, this seed carrier could help reforest the most remote areas

Science Friday A new twist on sowing seeds

Reuters Wooden seed carriers mimic self-burying seeds

New Atlas Plant-inspired E-seeds drill themselves into the dirt when moistened

Futurity Wooden carrier unwinds to bury seeds

ZME Science Scientists create wooden seeds carrier that imitates self-burying seeds

New York Times Flat pasta that turns into 3-D shapes — just add boiling water

Science Advances Online Cover

Science Magazine A new twist on pasta dough could reshape food manufacturing

ABC News Groovy flat-packed pasta could help revolutionize food production

Science Friday A bowl full of pasta engineering

Smithsonian Magazine Mighty morphing 'flat-pack' pasta changes shape in boiling water

UK Daily Mail Don't tell the Italians! 'Flat-pack pasta' morphs from 2D to 3D while cooking and could slash the need for excessive plastic packaging

Designboom This flatpack pasta will morph into all sorts of 3D shapes when cooked

UW News Coffee grounds and Reishi mushroom spores can be 3D printed into a compostable alternative to plastics

3D Printing Industry Coffee grounds for 3D printing? A unique take on sustainable options for molds

SERVICE

Organizing Committee, Student Volunteer Co-Chair

ACM UIST — 2024, 2025

Program Committee, Associate Chair

ACM TEI Late Breaking Work — 2026

Program Committee, Associate Chair

ACM Chinese CHI — 2021, 2023

Paper Reviewing

ACM CHI — 2023, 2024, 2025, 2026

ACM UIST — 2023, 2024, 2025

ACM TEI — 2024

ACM DIS — 2023

ACM Chinese CHI — 2022

Session Chairing

	ACM SCF	2022
	Student Volunteer	
	ACM SCF	2019
STUDENTS MENTORED	**Taylor Hilton**, Masters, Materials Science and Engineering, UW	2024
	Yuecheng Peng, Masters, Global Innovation Exchange, UW	2023
	Malika Khurana, Masters, Computational Design, CMU	2020
	Prabin Paneru, Research Intern, CMU	2019
	Rahul Sharma, Masters, Mechanical Engineering, CMU	2019
ACADEMIC TEACHING EXPERIENCE	**HCDE 439: Physical Computing**	
	Teaching Assistant	Spring 2025
	HCDE 439: Physical Computing	
	Co-instructor	Fall 2025