YUXUAN MEI

+1 (646) 830-3939   ym2552@cs.washington.edu   UW Homepage

EDUCATION

Ph.D. Computer Science, University of Washington, School of Computer Science & Engineering, Expected June 2025.

    Dissertation: Design for Sustainable Fabrication.

    Advisor: Adriana Schulz.

M.S. Computer Science, University of Washington, School of Computer Science & Engineering, June 2022.

B.S. Computer Science, Columbia University, School of Engineering and Applied Sciences, *summa cum laude*, May 2019.

RESEARCH INTERESTS

Computational design and fabrication; physically based computer graphics and simulation; design for sustainability.

RESEARCH TOPICS

Sustainable Electronics   In DeltaLCA [1], we developed a tool that compares the environmental impact of two printed-circuit board designs with only partial information using a component-level comparison algorithm, significantly reducing the need for expert input from several hours to just a few minutes by leveraging incomplete data. We continue to identify challenges and opportunities in the space [2] and develop new tools and algorithms that support easier evaluation of sustainability metrics for consumers and companies.

Sustainable Fabrication   In FabHacks [3, 4], we created a solver-aided domain-specific language FabHaL and a design system on top of this DSL that allows users to create fixture hacks by reusing everyday objects found at home. The DSL encodes rules on how shape primitives form connections and the underlying solver can take a partial specification of a design in the DSL and complete the design specification, evaluating the design's final configuration under gravity. We continue to develop design tools with a focus on recycling and reusing materials.

Computational Knitting   We create a design tool for knitting pattern templates [5] by first letting the user create a coarse quad mesh given the input geometry and then solving for a knittable design given the user-specified knitting design directives. With a key insight into how quad mesh singularities relate to knitting compositions, we were able to develop a meshing interface accessible to knitters. Recently, we looked into illusion knitting and developed a design tool [6] that supports embedding two images into the illusion.

3D Printing Simulation   We tried to develop a novel simulation method that can accurately simulate a part created by extrusion-based 3D printing. Instead of treating the part as a solid and modeling the anisotropy with material parameters, we represent the part using discrete elastic rods, augment it to support arbitrary cross-sections of the printed strands, and fit data from experiments to create a bonding force model.

HONORS & AWARDS

Bob Bandes Memorial Teaching Award Honorable Mention, University of Washington, 2024.

CSE First-year Research Fellowship, University of Washington, 2019.

Russell C. Mills Award, Columbia University, 2019.

Dean's List, Columbia University, 2015 - 2018.

PEER-REVIEWED PUBLICATIONS

* indicates equal contributions.

[1]   Zhihan Zhang*, Felix Hähnlein, Yuxuan Mei*, Zachary Englhardt, Shwetak Patel, Adriana Schulz, and Vikram Iyer. "DeltaLCA: Comparative Life-Cycle Assessment for Electronics Design". In: *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 8.1 (Mar. 2024), 29:1–29:29. DOI: `10.1145/3643561`.

[2]   Zachary Englhardt, Felix Hähnlein, Yuxuan Mei, Tong Lin, Connor Masahiro Sun, Zhihan Zhang, Adriana Schulz, Shwetak Patel, and Vikram Iyer. *Incorporating Sustainability in Electronics Design: Obstacles and Opportunities*. In Proceedings of the ACM CHI conference on Human Factors in Computing Systems. (Honorable Mention, top 5%). 2025. arXiv: `2503.14893 [cs.HC]`. URL: `https://arxiv.org/abs/2503.14893`.

[3]   Yuxuan Mei, Benjamin Jones, Dan Cascaval, Jennifer Mankoff, Etienne Vouga, and Adriana Schulz. "FabHacks: Transform Everyday Objects into Home Hacks Leveraging a Solver-aided DSL". In: *Proceedings of the 9th ACM Symposium on Computational Fabrication*. SCF '24. New York, NY, USA: Association for Computing Machinery, July 2024, pp. 1–16. ISBN: 9798400704963. DOI: `10.1145/3639473.3665788`.

[5] Benjamin Jones, Yuxuan Mei, Haisen Zhao, Taylor Gotfrid, Jennifer Mankoff, and Adriana Schulz. "Computational Design of Knit Templates". In: *ACM Trans. Graph.* 41.2 (Dec. 2021), 16:1–16:16. ISSN: 0730-0301. DOI: 10.1145/3488006.

[6] Amy Zhu, Yuxuan Mei, Benjamin Jones, Zachary Tatlock, and Adriana Schulz. "Computational Illusion Knitting". In: *ACM Trans. Graph.* 43.4 (July 2024), 152:1–152:13. ISSN: 0730-0301. DOI: 10.1145/3658231.

DEMOS AND PATENTS

[4] Yuxuan Mei, Dan Cascaval, Benjamin Jones, Etienne Vouga, and Adriana Schulz. "FabHacks: A Domain-specific Language for Functional Fixtures Using Everyday Objects". In: *Proceedings of the 7th Annual ACM Symposium on Computational Fabrication*. SCF '22. New York, NY, USA: Association for Computing Machinery, Oct. 2022, pp. 1–2. ISBN: 9781450398725. DOI: 10.1145/3559400.3565591.

[7] Vidya Narayanan, Yuxuan Mei, Seungbae Bang, and Sunil Sharadchandra Hadap. "Garment pattern generation from image data". US12198290. Jan. 14, 2025.

TEACHING EXPERIENCE

University of Washington - Seattle Campus

CSE 163 Intermediate Data Programming: Summer 2024, instructor.

CSE 163 Intermediate Data Programming: Winter 2024, teaching assistant for Prof. Kevin Lin.

CSE 493H Special Topics in Computer Science - Computational Fabrication: Autumn 2023, teaching assistant for Prof. Adriana Schulz.

CSE 556 Computational Fabrication: Winter 2022, teaching assistant for Prof. Adriana Schulz.

Columbia University in the City of New York

COMS W1004 Introduction to Computer Science in Java: Fall 2016, Spring 2017, Fall 2017, Spring 2018, course assistant; Fall 2018, head teaching assistant for Prof. Adam Cannon; Spring 2019, head teaching assistant for Prof. Paul Blaer.

COMS W4160 Computer Graphics: Spring 2018, Spring 2019, teaching assistant for Prof. Changxi Zheng.

COMS W4167 Computer Animation: Fall 2018, teaching assistant for Prof. Eitan Grinspun.

MENTORING EXPERIENCE

University of Washington - Seattle Campus

Winter 2025: Audrey Que.

Autumn 2024: Audrey Que (CSE 499), Darel Hansel Gunawan.

Spring 2024: Mingsheng Xu, Stanley Yang (CSE 499 / CSE 492R).

Winter 2024: Annabelle Martin, Mingsheng Xu, Stanley Yang (CSE 499 / CSE 492R); Masa Nakura, Vivek Sarkar (with Daniel Revier).

Autumn 2020: Milin Kodnongbua, Tom (Yu) Lou (CSE 499); Tosh Brown-Moore (ME 499).

Summer 2020: Milin Kodnongbua, Tom (Yu) Lou.

Spring 2020: Milin Kodnongbua (CSE 499).

WORK AND RESEARCH EXPERIENCE

Graduate research assistant, *advised by Prof. Adriana Schulz*, Jun 2019 - Jun 2025.

Conduct research on various topics in graphics and fabrication, including sustainable design for electronics, DSL for fixture hack design, simulation for 3D printing, computational design for knitting.

Applied Scientist Intern at Amazon, Sunnyvale, CA, June 2023 - Sept 2023.

Researched on 3D garment reconstruction and virtual try-on image inpainting.

Applied Scientist Intern at Amazon, remote, June 2022 - Sept 2022.

Researched on garment representation and proposed method [7] for creating a garment dataset as part of a 3D VTO pipeline.

Undergraduate research assistant, *advised by Prof. Changxi Zheng*, Sep 2018 - May 2019.

Researched on noise removal and learning-based audio processing, trained and evaluated ML models with scraped audio data with PyTorch.

Software Engineering Intern at Google, New York, NY, May 2018 - Aug 2018.

Designed and implemented a FlumeJava pipeline to process front end activity logs into activity graphs as part of an internal tool.

Undergraduate research assistant, *advised by Prof. Steven Feiner*, Sep 2017 - Dec 2017.

Worked with VR researchers to create foliage visualizations using Unity packages with custom C# scripts.

Engineering Practicum Intern at Google, Los Angeles, CA, May 2017 - Aug 2017.

Designed and implemented an overview page in the app Keyword Planner that displays forecast data using Angular Dart and Sass.

Undergraduate research assistant, *advised by Prof. Douglas Almond and Prof. Shuang Zhang*, Sep 2016 - Jan 2017.

Scraped and cleaned pollution monitoring data for statistical analysis that contributed to an academic publication.

LEADERSHIP AND EXTRACURRICULAR EXPERIENCE

Exec member, WiGRAPH (women in graphics research), May 2020 - Jun 2025.

Event/program organizing, website setup, and funding management for the organization as treasurer.

Volunteer, Computational Fabrication Seminar, Mar 2021 - Mar 2022.

UW COVID-19 PPE Design (gown), Mar 2020 - Jul 2020.

Javascript tutorial for Girls Who Code at Garfield High School, Dec 2019.

Board member, Columbia Womxn in Computer Science, 2016 - 2019.

Connected with corporate sponsors to fund events and conference (e.g., GHC) travel grants;

Planned corporate-related and community events for students (including the first diversity hackathon at Columbia).

Illustrator, Columbia Science Review, 2015 - 2018.

SERVICE

Reviewer for SIGCSE 2025, CHI Late Breaking Work and alt.chi 2025, Automation in Construction

UW CSE Friday Breakfast Coordinator, 2024 - 2025.

UW CSE PARS/PAMS (Pre-Application Reading/Mentoring Service) Reader, 2020 - 2024.

UW CSE PSC Scheduler, 2020 - 2022; Non-standard Visitor Coordinator, 2022; Activity Coordinator, 2024.

SIGGRAPH RCDC Mentor, 2021 and 2022.

UW CSE Faculty Recruiting Student Host, 2021.

UW CSE Historian, 2020 - 2022.

SIGGRAPH Student Volunteer, 2019.

ADDITIONAL INFORMATION

Languages: Mandarin (native speaker), English (fluent), Japanese (N1).

Programming Languages: C++, Python, MATLAB, Java, HTML/CSS/Javascript.

Software/Tools: git, LaTeX, libigl, Blender.

Other Interests: teaching, singing, running, dancing, baking.