YUECHENG PENG

ychpeng@uw.edu https://yuechengpeng.github.io/ (portfolio)

EDUCATION

University of Washington

Master of Science in Technology Innovation. GPA [3.98/4.0] *23.9 - 25.3*

- **Core Courses:** Programming for Digital & Physical User Interfaces (A), Managing Data & Signal Processing (A), Hardware/Software Lab I&II (A), Fabrication & Physical Prototyping (A-).

Zhejiang University

Bachelor of Engineering, Industrial Design. GPA [3.98/4.0] Rank [1/45] *19.9 - 23.6*

- **Core Courses:** Information & Interaction Design Technology (A), Artificial Intelligence (A), Computer Graphics (A), Physical Computing for Innovation Design (A), Data Visualization on Cross-Media (A), Ergonomics (A).

PUBLICATION

- Hannah Twigg-Smith, **Yuecheng Peng**, Emily Whiting, and Nadya Peek. 2024. What's in a cable? Abstracting Knitting Design Elements with Blended Raster/Vector Primitives. In The 37th Annual ACM Symposium on User Inter- face Software and Technology **(UIST '24)**.
- **Yuecheng Peng**, Danchang Yan, Haotian Chen, Yue Yang, Ye Tao, Weitao Song, Lingyun Sun, and Guanyun Wang. 2024. IntelliTex: Fabricating Low-cost and Washable Functional Textiles using A Double-coating Process. In Proceedings of the CHI Conference on Human Factors in Computing Systems **(CHI '24)**. **Best Paper Honorable Mention (top 5% of submissions)**.

RESEARCH EXPERIENCE

Morphing Matter Lab, University of California, Berkeley **05/2024 - 09/2024**

Research Intern | Advisor: Lining Yao

Biodegradable Hydrogel Device Fabrication

- Developed a fabrication pipeline for low-cost hollow tubular alginate ($0.0256/m), enabling continuous control over shell thickness (0.3 mm to fully solid) and fiber diameters (0.6 mm to 2.7 mm).
- Engineered high-sensitivity resistive and capacitive sensors using hollow alginate, achieving a 37.5% resistance change at 60% strain (1.7x higher) and a 700% capacity change at 10kPa (4.6x higher) compared to solid counterparts.
- Fabricated biodegradable actuators leveraging hollow alginate, demonstrating nine morphing primitives including expansion, bending, twisting, etc. Actuators exhibited up to 40% expansion and a 3.5-radian bend angle, with consistent durability over 200 inflation cycles.
- Designed and prototyped six applications, including eco-friendly interactive wearables, shape-changing confections, and underwater biodegradable grippers, demonstrating the versatility and ecological benefits of the method.
- Spearheaded a multidisciplinary team and served as the first author on a paper under review for CHI25.

Make4All Group, University of Washington **02/2024 - present**

Research Assistant | Advisor: Jennifer Mankoff, Jerry Cao

3D Printed Foam Augmentation | GitHub

- Utilized viscous instability printing to augment off-the-shelf objects for improved ergonomics, embedding electronics and printing with conductive TPU to create integrated sensors for touch and resistive pressure sensing.
- Developed a web-based slicer software to generate optimized toolpaths for foam printing over existing objects.

Mobility Device Modification | GitHub

- Prototyped hot-swappable electronic add-on modules for mobility devices. Users praised the multifunctionality and modularity, allowing them to reconfigure and customize the setup based on different use cases.
- Fabricated modular cane prototypes with interchangeable handles and tips using resin casting and FDM/resin 3D printing. Users praised the isolated feature customization and ease of swapping in the community.
- Work submitted to CHI25 as a coauthor.

Machine Agency, University of Washington **10/2023 - present**

Research Assistant | Advisor: Nadya Peek, Hannah Twigg-Smith

Machine Knitted Sensor Fabrication | Website

- Applied various machine knitting techniques (e.g., intarsia, short rows) to fabricate wearable textile sensors, including touch, humidity, pressure, and bend sensors, on the Silver Reed SK840. Work accepted to UIST '24 as second author.

Guanyun Lab, Zhejiang University **09/2022 - 01/2024**

Research Assistant | Advisor: Guanyun Wang, Ye Tao

Washable Functional Textiles Fabrication | Paper | GitHub

- Proposed a low-cost ($4.7/m^2) and highly accessible double-coating process to fabricate washable (at least 600 min daily laundry) and reusable functional textiles with customized input functionalities.
- Conducted extensive material experiments and evaluations, improving the resistance stability of functional textiles over wash cycles by 680%.
- Prototyped and open-sourced various wearable applications of the washable functional textiles.
- Research leader for the project, independently authored the paper accepted by CHI '24 (Best Paper Honorable Mention) as the first author.

IDEA Lab, Zhejiang University **10/2021 - 04/2022**

Research Assistant | Advisor: Lingyun Sun, Xuanhui Liu

Designing Knowledge Graph Tool for Sustainability Education | Website

- Designed and developed Sustain-KG, a knowledge graph tool integrating interdisciplinary knowledge and Sustainable Development Goals (SDGs).
- Conducted a user study, which revealed how Sustain-KG enabled students to effectively apply structured knowledge in sustainability problem-solving processes, leading to improved competence in analyzing sustainability challenges and fostering deeper connections between knowledge and solutions.
- Collected, organized, and analyzed related works. Authored and submitted a paper to the Journal of Cleaner Production.

D3Lab, Zhejiang University **08/2021 - 12/2021**

Research Assistant | Advisor: Liuqing Chen

HoloLens 2 Expander Interaction

- Led the design team and came up with design guidelines with standardized workflow, which increased inter-team work efficiency by approximately 60%.
- Optimized user experience with the HoloLens2 interface, reducing average task completion time by 35% and increasing user satisfaction by 40%, as measured in post-surveys focused on comfort and immersiveness.
- Our design team was selected to partner with Zhejiang Provincial Energy Group Company Ltd. in the bidding.

AWARDS

- Honorable Mention Award, 2024, Design Intelligence Award (DIA) (for IntelliTex).
- Best Paper Honorable Mention Award, 2024, the ACM Conference on Human Factors in Computing Systems.
- Outstanding Undergraduate Thesis Project, 2023, Zhejiang University.
- Excellent Academic Model, 2020, 2021, 2022, 2023, Zhejiang University.
- Second-Class Scholarship (top 8% of applicants), 2020, 2022, Zhejiang University.
- Third-Class Scholarship (top 20% of applicants), 2021, Zhejiang University.

SKILLS

- **Fabrication**: PCB Fabrication, machine knitting, 3D printing, laser cutting, CNC, embroidery, etc.
- **Electrical Engineering**: PCB design (KiCAD), wireless communication (WiFi, BLE), microcontroller (ESP32, Arduino), microprocessor (Raspberry Pi).
- **Programming**: JavaScript, Python, C, C#, Processing, signal processing, basic AI models.
- **Design & Research**: Rhino, Fusion 360, Figma, Adobe Suit, design thinking, semi-structured interviews, focus groups, surveys, statistical analysis (SPSS).
- **Languages**: Chinese (native), English (Fluent: TOEFL 112 (R30 L30 S26 W26), GRE 325).