Tianyu Yu

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EDUCATION

University of California, Berkeley — **Berkeley, CA, USA**
- PhD, Mechanical Engineering — 2029 (expected)

Tsinghua University — **Beijing, China**
- Master of Fine Arts, Information and Art Design — 2024

Tsinghua University — **Beijing, China**
- Bachelor of Engineering, Automation — 2021
- Bachelor of Fine Arts, Industrial Design — 2021

RESEARCH INTERESTS

I'm interested in exploring **novel materials, hardware, and robots** that enable unique interaction beyond conventional computing devices, and **the computational design and fabrication tools** that propel the trend forward.

RESEARCH EXPERIENCE

University of California, Berkeley

Research Assistant, Morphing Matter Lab | Advisor: Prof. Lining Yao — **08/2024 – Present**
- Lead a research project of dexterous robotic hands with morphing fingertips, enabling tunable stiffness for grasping small or fragile objects and suction-based grasping of large or flat objects. Conduct the overall design, mechanical design, fabrication, functional prototype development, mechanical testing, and robotic experiments. **(ongoing)**
- Led the design of multimodal robotic skins and a series of product-oriented application prototypes, based on advanced, flexible fluidic actuators powered by electroosmotic pumps. Designed and developed product-oriented functional prototypes, including robotic grippers, reconfigurable soft robots, wearable haptic devices, and tangible displays. Conducted the concept design, mechanical design, fabrication, and hardware prototyping and testing. **(Best Paper, ACM UIST 2025 [3]; Best Student Paper, IEEE RoboSoft 2026 [1])**

Tsinghua University

Research Assistant, Mercedes-Benz, Beijing & The Future Laboratory — **11/2022 – 09/2024**
- Led the design and development of a futuristic steering wheel that delivers tactile feedback to drivers through pneumatic morphing surfaces to enhance the driving experience. Designed, built, and evaluated functional prototypes with the industrial team. Conducted a user study on driving experience with the prototype in a simulated driving environment. **(Capstone Project of the Master's Degree)**
- Led a collaborative research project exploring automotive interior concept design based on smart materials (materials that can change shape, appearance, etc., or with sensing capabilities). Developed a customized card-based ideation tool to facilitate interdisciplinary design collaboration among mulitple stakeholders, including product designers, technical researchers, and industry partners. **(ACM DIS 2025 [5])**

Research Assistant, The Future Laboratory | Advisor: Prof. Haipeng Mi, Yingqing Xu — **07/2021 – 09/2024**
- Led the design of a fluid-driven thermal interface capable of generating programmable temperature patterns across curved surfaces for thermal haptic feedback and thermochromic visual animations. Designed and fabricated functional prototypes based on the interface, including dynamic sculptures, paintings, and furniture. Developed computational design and simulation tools to support the design and fabrication process. **(ACM CHI 2023 [7])**

Research Assistant, Pervasive HCI Group | Advisor: Prof. Chun Yu, Yuanchun Shi — **03/2020 – 10/2020**
- Co-led the design of a handheld haptic navigation device to assist people with visual impairments. Prototyped the device and conducted a user study to evaluate its performance in indoor navigation tasks. **(ACM CHI 2021 [9])**

Massachusetts Institute of Technology

Visiting Student, HCIE Group, MIT CSAIL | Advisor: Prof. Stefanie Mueller — **07/2023 – 10/2023**
- Contributed to the design and development of a novel printing technique that uses multilayer thermochromic pigments and block printing to create dynamically changing visual images. Proposed a fabrication workflow with a computational design tool to support the printing process. **(ACM SIGGRAPH Asia 2024 Art Papers [6])**

Visiting Student, Tangible Media Group, MIT Media Lab | Advisor: Prof. Hiroshi Ishii — **07/2019 – 10/2019**
- Contributed to the design and development of microfluid-based interactive materials that dynamically change their visual appearance in response to external forces and deformation. Developed computational design and simulation tools to support the design and fabrication process. **(ACM CHI 2020 [10])**

AWARD AND HONOR

Research Paper Award

- 🏆 Best Student Paper Award, IEEE International Conference on Soft Robotics (RoboSoft) [1 winner] 2026
- 🥇 Young Research Paper Finalist, IEEE International Conference on Soft Robotics (RoboSoft) 2026
- 🥇 Best ZooQuarium (demo) Finalist, IEEE International Conference on Soft Robotics (RoboSoft) 2026
- 🏆 Best Paper Award, ACM Symposium on User Interface Software and Technology (UIST) [Top 3%] 2025
- 🥇 Best Paper Honorable Mention, ACM Symposium on User Interface Software and Technology (UIST) [Top 5%] 2023

Academic Award

- 🥇 Chiang Fellowship for Graduate Scholars in Manufacturing and Engineering, UC Berkeley 2027
- 🥇 First Year Fellowship for Graduate Scholars, UC Berkeley 2024
- 🥇 Outstanding Graduate of Beijing [Top 5%] 2024, 2021
- 🏆 China National Scholarship [Top 1%] 2023, 2019
- 🥇 Overall Excellence Scholarship, Tsinghua University 2022, 2020, 2019, 2018, 2017
- 🏆 Outstanding Graduate Award, Tsinghua University [Top 2%] 2021

Art and Design Award

- 🏆 Zijin Award (Nanjing) China College Student Design Exhibition (CHENG: Interactive Music Chess) 2021
- 🥇 Finalist in Asia Digital Art Award FUKUOKA (CHENG: Interactive Music Chess) 2021
- 🏆 A'Design Award (Venous Materials, contributor) 2021

PROFESSIONAL SKILLS

- **Mechanical Engineering and Design:** Rhino, Grasshopper, Solidworks, AutoCAD, Keyshot, and Adobe suit.
- **Electrical Engineering and Computer Science:** pneumatic and hydraulic system, robotic arm platforms, basic AI methods, Python, Arduino, C++, MATLAB.
- **Rapid prototyping:** 3D printing, laser cutting, CNC, soft robot fabrication, PCB.

SELECTED PUBLICATION

[1] **Tianyu Yu**, Hajun Lee, Lining Yao. BiEOP: A Bistable, Soft Actuator Driven by Electroosmotic Pumps. *Proceedings of the 9th IEEE International Conference on Soft Robotics* **(IEEE RoboSoft '26)** 🏆 **Best Student Paper Award,** 🥇 **Young Research Paper Finalist,** 🥇 **ZooQuarium (demo) Finalist**

[2] Qiuyu Lu, Semina Yi, Tucker Rae-Grant, **Tianyu Yu**, Dinesh K. Patel, Lining Yao. Morphing Matter to Support Ecological Restoration. **Nature Reviews Materials.** 2026

[3] **Tianyu Yu**, Peisheng He, Bob Tianqi Wei, Chenyuheng Wang, Xueqing Li, Xuezhu Wang, Yao Lu, Wei Yue, Megan Teng, Zihan Wang, Liwei Lin, Haipeng Mi, Qi Lu, Lining Yao. MorphingSkin: A Skin-like Platform that Integrates Multimodal Hydraulic Actuators Based on Flexible Electroosmotic Pumps. *Proceedings of the 38th Annual ACM Symposium on User Interface Software and Technology* **(UIST '25)** 🏆 **Best Paper Award**

[4] Hajun Lee, **Tianyu Yu**, Mingjie Zheng, David Jourdan, Yuxuan Sun, Lining Yao. Programmable Sponge for Hydro-Active Morphing Module with Light Weight and High-Volume Change. **Advanced Functional Materials. 2025.**

[5] **Tianyu Yu**, Xuezhu Wang*, Yao Lu*(equally contribute), Kejin Yu, Xiwen Yao, Wenjing Deng, Zhiyu Li, Xueqing Li, Xiao Xue, Yue Yang, Yijie Guo, Yuan Yao, Guanhong Liu, Haipeng Mi. A Card-based Co-Design Toolkit for Exploring Smart Material Applications with Multiple Stakeholders: A Case Study on Automotive Interior Design. *Proceedings of the 2025 ACM Designing Interactive Systems Conference* **(DIS '25)**

[6] Ticha Sethapakdi, Paris Myers, **Tianyu Yu**, Juliana Covarrubias, Mackenzie Leake, Stefanie Mueller. Thermochromorph: Dynamic Relief Printing with Thermochromic Inks. **(SIGGRAPH Asia Art Papers '24)**

[7] **Tianyu Yu**, Weiye Xu, Haiqing Xu, Guanhong Liu, Chang Liu, Guanyun Wang, and Haipeng Mi. Thermotion: Design and Fabrication of Thermofluidic Composites for Animation Effects on Object Surfaces. *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* **(CHI '23)**

[8] Qiuyu Lu, **Tianyu Yu**, Semina Yi, Yuran Ding, Haipeng Mi, Lining Yao. Sustainflatable: Harvesting, Storing and Utilizing Ambient Energy for Pneumatic Shape-changing Interfaces. *Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology* **(UIST '23)** 🥇 **Best Paper Honorable Mention**

[9] Guanhong Liu*, **Tianyu Yu* (equally contribute)**, Chun Yu, Haiqing Xu, Shuchang Xu, Ciyuan Yang, Feng Wang, Haipeng Mi, and Yuanchun Shi. Tactile Compass: Enabling Visually Impaired People to Follow a Path with Continuous Directional Feedback. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* **(CHI '21)**

[10] Hila Mor, **Tianyu Yu**, Ken Nakagaki, Benjamin Harvey Miller, Yichen Jia, and Hiroshi Ishii. Venous Materials: Towards Interactive Fluidic Mechanisms. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* **(CHI '20)**