Yiyue Luo

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EDUCATION & ACADEMIC POSITIONS

Sep 2024 - Present **University of Washington**
Assistant Professor, Electrical and Computer Engineering

Sep 2020 - Aug 2024 **Massachusetts Institute of Technology**
Ph.D., Electrical Engineering and Computer Science
Advisor: Professor Wojciech Matusik & Professor Tomás Palacios
Thesis: Intelligent Textiles for Physical Human-Environment Interactions

Aug 2018 - May 2020 **Massachusetts Institute of Technology**
M.S., Electrical Engineering and Computer Science
Advisor: Professor Wojciech Matusik & Professor Tomás Palacios
Thesis: Discovering the Patterns of Human-environment Interactions via Scalable Functional Textiles

Aug 2014 - Dec 2017 **University of Illinois at Urbana - Champaign**
B.S., Materials Science and Engineering

HONORS & AWARDS

2024 **Forbes 30 Under 30 North America, Science**

2023-2024 **Accenture Fellowship**

2023 **The Path of Professorship Workshop Participant, MIT**

2023 **Best Poster Award, GW6 Summit at MIT**

2023 **Meta Fellowship Finalist**

2022-2023 **Schwarzman College of Computing Fellowship by Google**

2021-2022 **MathWorks Engineering Fellowship**

2021 **Best Paper Honorable Mention Award for KnitUI, CHI '21**

2017 **James Scholar**
For outstanding students in Engineering College at UIUC.

2017 **Cullen W. Parmelee International Research Scholar**
For outstanding international undergraduate researcher in Materials Science and Engineering at UIUC.

2015-2017 **Dean's List**
For outstanding academic performance at UIUC.

2015 **Alfred W. Allen Award**
For outstanding students in Materials Science and Engineering department at UIUC.

PROFESSIONAL EXPERIENCE

Sep 2024 - Present **Wearable Intelligence Lab, UW**
Principle Investigator | Seattle, WA

Aug 2018 - Aug 2024 **The Computational Design & Fabrication Group, MIT**
Research Assistant | Cambridge, MA
Advisor: Professor Wojciech Matusik & Professor Tomás Palacios

Jun 2023 - Sep 2023 **Boston Dynamics AI Institute**
Research Intern | Cambridge, MA
Mentor: Dr. Brian Okorn & Prof. Jessica Hodgins
Project: Decoding Human-object Interactions via Tactile Sensing

May 2022 - Aug 2022 **RiSE Group, Microsoft Research**
Research Intern | Redmond, WA
Mentor: Dr. Teddy Seyed
Project: Enabling Gestural Interactions on a Keyboard using a Graphene-based Fabric

Mar 2018 - Aug 2018 **Chinese Academy of Science**
Research Intern | Guangzhou, China
Mentor: Dr. Xuetong Sun
Project: Porous Polypyrrole on 3D printed structures for Controlled Drug Release

Feb 2016 - Dec 2017 **Rogers Research Group, UIUC**
Research Assistant | Urbana, IL
Mentor: Professor John A. Roger & Dr. Zheng Yan
Project: Mechanical Assembly of Functional 3D Mesostructures

PUBLICATIONS

Work in Progress

[1] Chao Liu, Michael Foshey, Joseph DelPreto, Young Joong Lee, **Yiyue Luo**, Daniela Rus, Antonio Torralba, and Wojciech Matusik. "Multi-Modal Embroidered Sensors for Tactual Perception". In: (2024). Near submission.

[2] Cedric Honnet, **Yiyue Luo**, Wedyan Babatain, Ozgun Kilic Afsar, Sarah Nicita, Chloe Bensahel, Yunyi Zhu, Eric Gallo, Andreea Danielescu, Hiroshi Ishii, Stefanie Mueller, Neil Gershenfield, and Joe Paradiso. "FiberCircuits: Miniature Flexible Circuits with Microcontrollers, Sensors and Actuators, for Interactive Fibers". In: (2024). Submitted.

Highlighted Peer-reviewed Journals and Conference Publications

[4] Devin Murphy, Junyi Zhu, Paul Liang, Wojciech Matusik, and **Yiyue Luo**. "WiReSens Toolkit: An Open-source Platform towards Accessible Wireless Tactile Sensing". In: *arXiv preprint arXiv:2412.00247* (2024).

[5] Ruonan Zheng, Jiawei Fang, Yuan Yao, Xiaoxia Gao, Chengxu Zuo, Shihui Guo, and **Yiyue Luo**. "FIP: Endowing Robust Motion Capture on Daily Garment by Fusing Flex and Inertial Sensors". In: CHI (2024).

[6] Binghao Huang, Yixuan Wang, Xinyi Yang, **Yiyue Luo**, and Yunzhu Li. "3D-ViTac: Learning Fine-Grained Manipulation with Visuo-Tactile Sensing". In: *arXiv preprint arXiv:2410.24091* (2024).

[7] **Yiyue Luo**, Chao Liu, Young Joong Lee, Joseph DelPreto, Kui Wu, Michael Foshey, Daniela Rus, Tomás Palacios, Yunzhu Li, Antonio Torralba, et al. "Adaptive tactile interaction transfer via digitally embroidered smart gloves". In: *Nature communications* 15.1 (2024), p. 868.

[8] **Yiyue Luo**, Murphy Wonsick, Jessica Hodgins, and Brian Okorn. "Tactile Embeddings for Multi-Task Learning". In: *2024 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2024, pp. 3348–3355.

[9] Junyi Zhu*, Young Joong* Lee, **Yiyue Luo***, Tianyu Xu, Chao Liu, Daniela Rus, Stefanie Mueller, and Wojciech Matusik. "Liquids Identification and Manipulation via Digitally Fabricated Impedance Sensors". In: *2024 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2024, pp. 18164–18171.

[10] Joseph DelPreto, Chao Liu, **Yiyue Luo**, Michael Foshey, Yunzhu Li, Antonio Torralba, Wojciech Matusik, and Daniela Rus. "ActionSense: A Multimodal Dataset and Recording Framework for Human Activities Using Wearable Sensors in a Kitchen Environment". In: *Advances in Neural Information Processing Systems*. NeurIPS. 2022.

[11] **Yiyue Luo**, Kui Wu, Andrew Spielberg, Michael Foshey, Daniela Rus, Tomás Palacios, and Wojciech Matusik. "Digital fabrication of pneumatic actuators with integrated sensing by machine knitting". In: *Proceedings of the ACM Conference on Human Factors in Computing Systems*. CHI. 2022.

[12] Lara Zlokapa, **Yiyue Luo**, Jie Xu, Michael Foshey, Kui Wu, Pulkit Agrawal, and Wojciech Matusik. "An Integrated Design Pipeline for Tactile Sensing Robotic Manipulators". In: *International Conference on Robotics and Automation*. ICRA. 2022.

[13] Qiang Zhang*, Yunzhu Li*, **Yiyue Luo**, Wan Shou, Michael Foshey, Junchi Yan, Joshua B Tenenbaum, Wojciech Matusik, and Antonio Torralba. "Dynamic modeling of hand-object interactions via tactile sensing". In: *IEEE/RSJ International Conference on Intelligent Robots and Systems*. IROS. 2021.

[14] **Yiyue Luo**, Yunzhu Li, Pratyusha Sharma, Wan Shou, Kui Wu, Michael Foshey, Beichen Li, Tomás Palacios, Antonio Torralba, and Wojciech Matusik. "Learning human–environment interactions using conformal tactile textiles". In: *Nature Electronics* 4.3 (2021).

[15] **Yiyue Luo**, Yunzhu Li, Michael Foshey, Wan Shou, Pratyusha Sharma, Tomás Palacios, Antonio Torralba, and Wojciech Matusik. "Intelligent carpet: Inferring 3d human pose from tactile signals". In: *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition*. CVPR. 2021.

[16] **Yiyue Luo***, Kui Wu*, Tomás Palacios, and Wojciech Matusik. "KnitUI: Fabricating interactive and sensing textiles with machine knitting". In: *Proceedings of the ACM Conference on Human Factors in Computing Systems*. CHI. 2021.

Other Peer-reviewed Journals, Conference Publications, and Short Papers

[17] Tongyan Wang, Mohan Chi, Yue Yu, Kedi Yan, Mo Li, **Yiyue Luo**, and Rua Mae Williams. "LuxKnit: Fabricating Interactive Display Textiles Integrated with Sensing by Machine Knitting". In: CHI (2024).

[18] Seokhyun Hwang, Seongjun Kang, Jeongseok Oh, Jeongju Park, Semoo Shin, **Yiyue Luo**, Joseph DelPreto, Sangbeom Lee, Kyoobin Lee, Wojciech Matusik, Daniela Rus, and SeungJun Kim. "TelePulse: Enhancing the Teleoperation Experience through Biomechanical Simulation-Based Electrical Muscle Stimulation in Virtual Reality". In: CHI (2024).

[19] Cedric Honnet, Tianhong Catherine Yu, Irmandy Wicaksono, Tingyu Cheng, Andreea Danielescu, Cheng Zhang, Stefanie Mueller, Joe Paradiso, and **Yiyue Luo**. "Democratizing Intelligent Soft Wearables". In: *Adjunct Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology*. 2024, pp. 1–3.

[20] Yunzhu Li and **Yiyue Luo**. "Intelligent textiles are looking bright". In: *Science* 384.6691 (2024), pp. 29–30.

[21] Beichen Li, Bolei Deng, Wan Shou, Tae-Hyun Oh, Yuanming Hu, **Yiyue Luo**, Liang Shi, and Wojciech Matusik. "Computational discovery of microstructured composites with optimal stiffness-toughness trade-offs". In: *Science Advances* 10.5 (2024), eadk4284.

[22] **Yiyue Luo**. "Intelligent Textiles for Physical Human-Environment Interactions". In: *Adjunct Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology*. 2023, pp. 1–5.

[23] **Yiyue Luo**, Evelina Barhudarian, and Teddy Seyed. "Project Mihr: Enabling Gestural Interactions on a Keyboard Using a Graphene-Based Fabric". In: *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems*. CHI EA. 2023.

[24] Lishuang Zhan, Yancheng Cao, Qitai Chen, Haole Guo, Jiasi Gao, **Yiyue Luo**, Shihui Guo, Guyue Zhou, and Jiangtao Gong. "Enable Natural Tactile Interaction for Robot Dog based on Large-format Distributed Flexible Pressure Sensors". In: *International Conference on Robotics and Automation*. ICRA. 2023.

[25] Yunho Choi, Dong-Hyeok Park, Sungha Lee, Isaac Han, Ecehan Akan, Hyeon-Chang Jeon, **Yiyue Luo**, SeungJun Kim, Wojciech Matusik, Daniela Rus, et al. "Seamless-walk: natural and comfortable virtual reality locomotion method with a high-resolution tactile sensor". In: *Virtual Reality* (2023).

[26] Mantian Xue, Charles Mackin, Wei-Hung Weng, Jiadi Zhu, **Yiyue Luo**, Shao-Xiong Lennon Luo, Ang-Yu Lu, Marek Hempel, Elaine McVay, Jing Kong, et al. "Integrated biosensor platform based on graphene transistor arrays for real-time high-accuracy ion sensing". In: *Nature communications* 13.1 (2022), p. 5064.

[27] Kewang Nan, Sahab Babaee, Walter W Chan, Johannes LP Kuosmanen, Vivian R Feig, **Yiyue Luo**, Shriya S Srinivasan, Christina M Patterson, Ahmad Mujtaba Jebran, and Giovanni Traverso. "Low-cost gastrointestinal

manometry via silicone–liquid-metal pressure transducers resembling a quipu". In: *Nature Biomedical Engineering* 6.10 (2022), pp. 1092–1104.

[28] Alexandre Kaspar, Kui Wu, **Yiyue Luo**, Liane Makatura, and Wojciech Matusik. "Knit sketching: from cut & sew patterns to machine-knit garments". In: *ACM Transactions on Graphics (TOG)* 40.4 (2021).

[29] Zheng Yan, Mengdi Han, Yan Shi, Adina Badea, Yiyuan Yang, Ashish Kulkarni, Erik Hanson, Mikhail E Kandel, Xiewen Wen, Fan Zhang, et al. "Three-dimensional mesostructures as high-temperature growth templates, electronic cellular scaffolds, and self-propelled microrobots". In: *Proceedings of the National Academy of Sciences* 114.45 (2017), E9455–E9464.

[30] Zheng Yan, Mengdi Han, Yiyuan Yang, Kewang Nan, Haiwen Luan, **Yiyue Luo**, Yihui Zhang, Yonggang Huang, and John A Rogers. "Deterministic assembly of 3D mesostructures in advanced materials via compressive buckling: A short review of recent progress". In: *Extreme Mechanics Letters* 11 (2017), pp. 96–104.

PATENTS

2023 **Resistive Sensing Arrays and Methods of Manufacturing the Same.** Wojciech Matusik. Michael J Foshey, Yiyue Luo. Provisional Patent Filed.

2021 **Systems and Methods for Estimating 3d Position and Movement from Tactile Signals.** Wojciech Matusik, Antonio Torralba, Michael J Foshey, Wan Shou, Yiyue Luo, Pratyusha Sharma, Yunzhu Li. US Patent Application No. 17/226.564.

TEACHING

Spring 2025 **EE546C: Emerging Interactive Technology, UW**
Seattle, WA

Winter 2025 **EE331: Devices and Circuits, UW**
Seattle, WA

Autumn 2024 **EE539C: Research Seminar on Wearable Intelligence, UW**
Seattle, WA

Sep 2023 - Dec 2023 **Kaufman Teaching Certificate, MIT**
Cambridge, MA

Sep 2021 - Jan 2022 **6.336: Introduction to Numerical Simulation, MIT**
Teaching Assistant | Cambridge, MA

Nov 2021 - Jan 2022 **MAS.865: Rapid-Prototyping of Rapid-Prototyping Machines, MIT**
Guest Lecturer | Cambridge, MA

Sep 2021 **3.173: Computing Fabrics, MIT**
Guest Lecturer | Cambridge, MA

Jan 2017 - May 2017 **IEFX 198: Introductory first-year experience courses, UIUC**
Teaching Assistant | Urbana, IL

Jan 2016 - May 2016 **ENG 100: Introductory first-year experience courses, UIUC**
Teaching Assistant | Urbana, IL

PROFESSIONAL ACTIVITIES & SERVICES

Program Chair/Committee/Panelist

2025	NSF CRII/FRR panelist, virtusl
2024	Panelist for EECS Rising Star, MIT
2024	UbiComp I4U Workshop 2024
2024	Guest editor at MDPI Sensors Special Issue
2024	UIST Wearable Workshop 2024
2024	ICRA Wearable Workshop 2024
2022	AHRI 2022

Department Service

2025	Committee for Department Fellowship
2024	Co-director of DFab Lab at UW
2024	Committee for Department Colloquium
2023	Course Aid for Academic Faculty Search Seminar, MIT
2019-2020	Volunteer for PhD visit days, EECS Graduate Student Association, MIT
2018	Vice President for PhD visit days, EECS Graduate Student Association, MIT

Reviewing

Journals	Nature Electronics, Science, Soft Robotics, Computer-Aided Design, Nature Machine Intelligence; IEEE Sensors; Virtual Reality
Conferences	ACM CHI 2021-2025; ACM UIST 2021-2024; ACM HRI 2021-2023; ICRA 2023-2025

SELECTED TALK & PRESENTATION

Full-body Tactile Sensing for Humans and Robots

Dec 2024	Invited talk at NeurIPS Tactile Processing Workshop | Vancouver, Canada

Intelligent Textiles for Physical Interactions

Dec 2024	Invited talk at UCLA ECE Colloquium| virtual
Nov 2024	Invited talk at Georgia Tech GVU Lecture | Atlanta, GA
Oct 2024	Invited talk at UbiComp I4U Workshop | virtual
Oct 2024	Invited talk at Tufts University Human-robot Interaction Seminar | virtual
Apr 2024	Invited talk at University of Michigan - Ann Arbor | Ann Arbor, IN
Apr 2024	Invited talk at Brown University | Providence, RI
Mar 2024	Invited talk at University of Illinois - Urbana Champaign | Virtual
Mar 2024	Invited talk at Stanford University | Stanford, CA
Mar 2024	Invited talk at Massachusetts Institute of Technology | Cambridge, MA
Mar 2024	Invited talk at Princeton University | Princeton, NJ
Feb 2024	Invited talk at New York University | Brooklyn, NY
Feb 2024	Invited talk at Dartmouth | Virtual
Feb 2024	Invited talk at University of California - Berkeley | Berkeley, CA
Feb 2024	Invited talk at Carnegie Mellon University | Pittsburgh, PA
Feb 2024	Invited talk at University of Washington | Seattle, WA

Jan 2024 Invited talk at University of Notre Dame | Notre Dame, IN

Intelligent Textiles for Physical Human-Environment Interactions

Oct 2023 Doctoral Dissertation at UIST '23 | San Francisco, USA

Machine-knitted Passive and Interactive Haptics Textiles with Integrated Binary Sensing

Oct 2023 Technical paper presentation at UIST '23 | San Francisco, USA

Digital Fabrication of Functional Textiles

Jul 2022 Invited talk at Tsinghua University | virtual

Apr 2022 Invited talk at Computational Fabrication Seminar | virtual

Digital Fabrication of Pneumatic Actuators with Integrated Sensing by Machine Knitting

May 2022 Technical paper presentation at CHI '22 | New Orleans, USA

Learning human-environment interactions using 3D conformal functional textiles

May 2023 Invited talk at TechBlick | virtual

Jun 2021 Invited talk at MIT Open Learning | virtual

May 2021 Invited talk at Smart Fabrication Seminar | virtual

KnitUI: Fabricating Interactive and Sensing Textiles with Machine Knitting

May 2021 Technical paper presentation at CHI '21 | virtual

SELECTED PRESS

2024 **Exhibition of tactile sensing interface** | Cambridge Science Festival

2024 **Smart glove teaches new physical skills**
MIT News Scientific America

2023 **Exhibition of machine-knitted pneumatic actuators** | Kent State University Museum

2023 **Exhibition of machine-knitted tactiel sensing vest** | Mobile World Congress in Europe and India

2023 **A natural and comfortable 'seamless-walk' virtual reality locomotion system**
MIT News, Yahoo Finance, Benzinga EurekAlert

2022 **A helping hand for robotic manipulator design**
MIT News, Hackaday, Tech Briefs, Tech Xplore, Robotics.ee

2022 **Soft assistive robotic wearables get a boost from rapid design tool**
MIT News, Mashable, TechCrunch, Pioneering Minds

2022 **A simple diagnostic tool for gastrointestinal disorders**
MIT News Medical Design Briefs

2021 **Intelligent carpet gives insight into human poses**
MIT News, Inceptive Mind, Daily Mail, ZDNet

2021 **Tactile textiles sense movement via touch**
MIT News, Nature Electronics News & Views, Fast Company, Mashable, Tech Xplore