Junyi Zhu - CV

Ph.D. Candidate
MIT Electrical Engineering & Computer Science Department
MIT Computer Science and Artificial Intelligence Lab
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Education

Massachusetts Institute of Technology, USA 2019 - now
Ph.D. in Computer Science
MIT EECS Department, MIT Computer Science and Artificial Intelligence Lab
Advisor: Professor Stefanie Mueller

Massachusetts Institute of Technology, USA 2017 - 2019
Master of Science in Computer Science
MIT EECS Department, MIT Computer Science and Artificial Intelligence Lab
Advisor: Professor Stefanie Mueller

University of Washington, USA 2013 - 2017
Bachelor of Science in Electrical Engineering
Department of Electrical & Computer Engineering
Advisor: Professor Joshua R. Smith, Professor Shwetak N. Patel

Full Paper Publications

[11] Donghyeon Ko, Yoonji Kim, **Junyi Zhu**, Michael Wessely and Stefanie Mueller. 2023. FlexBoard: A Flexible Breadboard for Interaction Prototyping on Curved and Deformable Surfaces. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (CHI '23). ACM. (To appear)

[10] Marwa AlAlawi, Noah Pacik-Nelson, **Junyi Zhu**, Ben Greenspan, Andrew Doan, Brandon M Wong, Benjamin Owen-Block, Shanti Mickens, Wilhelm Schoeman, Michael Wessely, Andreea Danielescu and Stefanie Mueller. 2023. MechSense: A Design and Fabrication Pipeline for Integrating Rotary Encoders into 3D Printed Mechanisms. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (CHI '23). ACM.

[9] **Junyi Zhu**, Yuxuan Lei, Aashini Shah, Gila R. Schein, Hamid Ghaednia, Joseph H. Schwab, Casper Harteveld and Stefanie Mueller. 2022. MuscleRehab: Improving Unsupervised Physical Rehabilitation by Monitoring and Visualizing Muscle Engagement. In *Proceedings of the 35th Annual ACM Symposium on User Interface Software and Technology* (UIST '22). ACM.

[8] Yoonji Kim, **Junyi Zhu**, Mihir Trivedi, Dishita G. Turakhia, Ngai Hang Wu, Donghyeon Ko, Michael Wessely and Stefanie Mueller. 2022. SensorViz: Visualizing Sensor Data Across Different Stages of Prototyping Interactive Objects. In *Proceedings of the 2022 ACM Designing Interactive Systems Conference* (DIS '22). ACM.

[7] **Junyi Zhu**, Jackson Snowden, Joshua Verdejo, Emily Chen, Hamid Ghaednia, Joseph H. Schwab, and Stefanie Mueller. 2021. EIT-kit: An Electrical Impedance Tomography Toolkit for Health and Motion Sensing. In *Proceedings of the 34th Annual ACM Symposium on User Interface Software and Technology* (UIST '21). ACM.

[6] **Junyi Zhu**, Yunyi Zhu, Jiaming Cui, Leon Cheng, Jackson Snowden, Mark Chounlakone, Michael Wessely and Stefanie Mueller. 2020. MorphSensor: A 3D Electronic Design Tool for Reforming Sensor Modules. In *Proceedings of the 33rd Annual ACM Symposium on User Interface Software and Technology* (UIST ’20). ACM.

[5] **Junyi Zhu**, Lotta-Gili Blumberg, Yunyi Zhu, Martin Nisser, Ethan Levi Carlson, Xin Wen, Kevin Shum, Jessica Ayeley Quaye, and Stefanie Mueller. 2020. CurveBoards: Integrating Breadboards into Physical Objects to Prototype Function in the Context of Form. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (CHI '20). ACM.

[4] Martin Nisser, **Junyi Zhu**, Tianye Chen, Katarina Bulovic, Parinya Punpongsanon, Stefanie Mueller. Sequential Support: 3D Printing Dissolvable Support Material for Time-Dependent Mechanisms. In *Proceedings of the Thirteenth International Conference on Tangible, Embedded, and Embodied Interaction* (TEI '19). ACM.

[3] Edward Wang, **Junyi Zhu**, Mohit Jain, Tien-Jui Lee, Elliot Saba, Lama Nachman, and Shwetak N. Patel. 2018. Seismo: Blood Pressure Monitoring using Built-in Smartphone Accelerometer and Camera. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (CHI '18). ACM. **[BEST PAPER NOMINEE]**

[2] Edward Wang, William Li, **Junyi Zhu**, Rajneil Rana and Shwetak N. Patel. Noninvasive hemoglobin measurement using unmodified smartphone camera and white flash. *2017 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society* (EMBC), Seogwipo, 2017.

[1] Edward Wang, **Junyi Zhu**, William Li, Rajneil Rana, and Shwetak Patel. 2017. HemaApp IR: noninvasive hemoglobin measurement using unmodified smartphone cameras and built-in LEDs. In *Proceedings of the 2017 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2017 ACM International Symposium on Wearable Computers* (UbiComp '17). ACM.

Short Papers, Extended Abstracts & Demonstrations

[8] Xinyi Yang, Katarina Bulovic, Susanna Chen, **Junyi Zhu** and Stefanie Mueller. 2023. Azimuth Calculation and Telecommunication between VR Headset and Smartphones for Nearby Interaction. In *Proceedings of the Seventeenth International Conference on Tangible, Embedded, and Embodied Interaction* (TEI ’23 Work in Progress). ACM.

[7] **Junyi Zhu**. 2022. Design and Fabricate Personal Health Sensing Devices. In *The Adjunct Publication of the 35th Annual ACM Symposium on User Interface Software and Technology* (UIST ’22 Adjunct). ACM.

[6] **Junyi Zhu**, Yuxuan Lei, Aashini Shah, Gila R. Schein, Hamid Ghaednia, Joseph H. Schwab, Casper Harteveld and Stefanie Mueller. 2022. Monitoring Muscle Engagement via Electrical Impedance Tomography for Unsupervised Physical Rehabilitation. In *Proceedings of the 35th Annual ACM Symposium on User Interface Software and Technology* (UIST ’22). ACM.

[5] **Junyi Zhu**, Liang He, Jun Nishida, Hamid Ghaednia, Hsin-Liu (Cindy) Kao, Jon E. Froehlich, Edward Wang, and Stefanie Mueller. 2022. SIG: Towards More Personal Health Sensing. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts* (CHI ’22 Extended Abstracts). ACM.

[4] Cedric Honnet, Yunyi Zhu, **Junyi Zhu**, Michael Wessely and Stefanie Mueller. 2022. WearaFab: Digital Fabrication for Wearables Toolkits. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts* (CHI '22 Extended Abstracts). ACM.

[3] **Junyi Zhu**, Jackson Snowden, Joshua Verdejo, Emily Chen, Hamid Ghaednia, Joseph H. Schwab, and Stefanie Mueller. 2021. EIT-kit Demo: An Electrical Impedance Tomography Toolkit for Health and Motion Sensing. In *Adjunct Publication of the 34th Annual ACM Symposium on User Interface Software and Technology* (UIST '21). ACM.

[2] **Junyi Zhu**, Yunyi Zhu, Jiaming Cui, Leon Cheng, Jackson Snowden, Mark Chounlakone, Michael Wessely and Stefanie Mueller. 2020. Demonstration of MorphSensor: A 3D Electronic Design Tool for Reforming Sensor Modules. In *Adjunct Publication of the 33rd Annual ACM Symposium on User Interface Software and Technology* (UIST '20). ACM.

[1] **Junyi Zhu**, Lotta-Gili Blumberg, Yunyi Zhu, Martin Nisser, Ethan Levi Carlson, Xin Wen, Kevin Shum, Jessica Ayeley Quaye, and Stefanie Mueller. 2020. CurveBoards Demo: Integrating Breadboards into Physical Objects to Prototype Function in the Context of Form. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems* (CHI EA '20). ACM.

Patents

[1] **Junyi Zhu**, Stiven Morvan, Dongeek Shin, Andrea Colaco, Sambuddha Basu, Sean Bae. Full Hand Kinematic Reconstruction Using Electrical Impedance Tomography Wearable. U.S. Patent Application No. 63/387,443.

Conference Service

Organizing Committee

ACM UIST, Video Previews Chair	2022

Associate Chair

ACM CHI Workshops	2023
ACM TEI	2023
ACM CHI Late Breaking Work	2021

Reviewer

ACM CHI	2020 - 2023
ACM UIST	2020 - 2022
ACM UbiComp	2020 - 2022
ACM TEI	2020 - 2021
ACM ISS	2020

Volunteering

ACM CHI Student Volunteer	2020
ACM CHI Program Committee Meeting, Subcommittee Chair Assistant	2019

Research Internships

Google AR Team, Google LLC — 2022 - 2023
Research Intern, Mountain View, CA Office
Advisor: Dr. Andrea Colaco & Dr. D. Shin

UW Ubicomp Lab, University of Washington — 2016 - 2017
Research Assistant, Paul G. Allen School of Computer Science & Engineering
Advisor: Professor Shwetak Patel

UW SEAL Lab, University of Washington 2016
Research Assistant, Department of Electrical & Computer Engineering
Advisor: Professor Alexander V. Mamishev

Exposure Sciences Group, University of Washington 2016
Research Assistant, School of Public Health
Advisor: Professor Edmund Seto

Work Experience

Senosis Health, Seattle, USA 2016 - 2017
Software Engineer, supervisor: Mike Clarke

Jiangsu SEUIC Technology Co., Ltd, China 2015
Software Engineer, supervisor: Prof. Chen Hu (Southeast University, China)

Invited Talks

International Youth Festival on Design Futures, Smart & Digital Futures. *Digital Healthcare: Future Personal Health Sensing Devices*, hosted by Dr. Yuqi Liu, Tsinghua University 2022

Google LLC, AR Perception Team. *Electrical Impedance Tomography: Introduction, Implementation, and Intuitions*, hosted by Dr. D. Shin 2022

University of Illinois at Urbana-Champaign, Coordinated Science Laboratory. *Building Personal Physical Rehabilitation Monitoring Devices*, hosted by CSLSC 2022

University of Chicago, Human Computer Integration Lab. *Towards More Personal Health Sensing Devices*, hosted by Prof. Pedro Lopes 2021

MIT, MIT Nano Explorations. *Integrating Object Form and Electronic Function in Rapid Prototyping and Personal Fabrication*, hosted by Prof. Vladimir Bulović 2020

Harvard University, Graduate School of Design, hosted by Prof. Krzysztof Wodiczko 2018

Awards and Honors

Siebel Scholars ($35000), Thomas and Stacey Siebel Foundation, 2022 - 2023

Thomas Stockham Jr. Fellowship ($100000), MIT, 2021 - 2022

Frederick C. Hennie III Teaching Award ($2200), MIT EECS Department, 2021

Best Paper Nominee, ACM CHI 2018

Seneff-Zue Computer Science Fellowship Award ($45000), MIT, 2017 - 2018

Dean's List, University of Washington, 2013 - 2017

Selected Press

MIT News. MIT system "sees" the inner structure of the body during physical rehab. 2022

Hackster.io. MuscleRehab Provides an Inside Look at What Your Muscles Do During Physiotherapy and More. 2022

Healthcare IT News. MIT, MGH create VR system to advance physical therapy at home. 2022

Medical Design & Outsourcing. MIT researchers seek to 'see' inside the body during rehab. 2022

MIT News. Making health and motion sensing devices more personal. 2021

Yahoo News, MIT's toolkit lets anyone design their own muscle-sensing wearables. 2021

Hackster.io. It's What's on the Inside That Counts. 2021

Espressif Systems. ESP32-powered Electrical Impedance Tomography Toolkit by MIT. 2021

MIT News. A hands-on class responds to Covid. 2021

Engadget, MIT's toolkit lets anyone design their own muscle-sensing wearables. 2021

MIT News. Electronic design tool morphs interactive objects. 2020

MIT News. Integrating Electronics onto Physical Prototypes. 2020

Hackster.io. Prototype Like a Pro. 2020

3D Printing Industry. MIT RESEARCHERS DEVELOP NOVEL 3D DESIGN SOFTWARE FOR EMBEDDED ELECTRONICS. 2020

UW ECE Spotlight. ECE alum Junyi Zhu integrates electronics onto physical prototypes at MIT with "CurveBoards". 2020

ACM TechNews. 3D-printed CurveBoards enable easier testing of circuit design on products. 2020

Inverse. TIRED: BREADBOARDS. WIRED: CURVEBOARDS. 2020

GeekWire. Google buys Seattle health monitoring startup Senosis, bolstering digital health push 2017

MIT Technology Review. How to make a smart phone detect anemia. 2016

Mentoring

All students are co-advised with Prof. Stefanie Mueller.

Master thesis

[4]	Gila R Schein	2022 - 2023
[3]	Yuxuan Lei	2021 - 2022
[2]	Joshua Verdejo	2020 - 2021
[1]	Lotta G. Blumberg	2018 - 2019

Research project students (SuperUROPs, UROPs)

[17]	Aashini Shah	2022	[8]	Jessica Ayeley Quaye	2019
[16]	Zipei Tan	2021	[7]	Ethan Levi Carlson	2019
[15]	Sloke Shrestha	2021	[6]	Xin Wen	2019
[14]	Emily Chen	2021	[5]	Kevin Shum	2019
[13]	Gila R Schein	2020	[4]	Leon Cheng	2019-2020
[12]	Jenny Chen	2020	[3]	Yunyi Zhu	2018-2020
[11]	Jackson Snowden	2020	[2]	Katharina Bulovic	2018
[10]	Jiaming Cui	2019-2020	[1]	Tianye Chen	2018
[9]	Mark Chounlakone	2019			

Teaching

Co-Instructor

[1]	**6.810**	**Engineering Interactive Technologies**, MIT	Autumn 2021

Teaching Assistant

[5]	**6.810**	**Engineering Interactive Technologies**, MIT	Autumn 2020
[4]	**6.810**	**Engineering Interactive Technologies**, MIT	Autumn 2018
[3]	**CSE/EE 474**	**Introduction to Embedded Systems**, UW	Autumn 2016
[2]	**CSE/EE 472**	**Introduction to Embedded Systems**, UW	Summer 2016
[1]	**CSE/EE 371**	**Design of Digital Circuits and Systems**, UW	Spring 2016

Lectures

6.810	**Engineering Interactive Technologies**, Health Sensing, MIT	Autumn 2020
6.810	**Engineering Interactive Technologies**, Computer Vision Workshop, MIT	Autumn 2018

References

Stefanie Mueller

Associate Professor, MIT EECS/MechE
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Cambridge, MA 02139, USA

Joseph H. Schwab, M.D.

Associate Professor, Harvard Medical School
Department of Orthopaedic Surgery, MGH
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Boston, MA 02114, USA

Shwetak N. Patel

Professor, University of Washington
Paul G. Allen School and ECE Department
shwetak@cs.washington.edu
185 Stevens Way
Seattle, WA 98195-2350, USA

Edward Jay Wang

Assistant Professor, UC San Diego
Electrical and Computer Engineering department
ejaywang@eng.ucsd.edu
9500 Gilman Drive
La Jolla, CA 92039, USA