Xin Liu

PhD Candidate · Paul G. Allen School of Computer Science & Engineering

University of Washington, Seattle

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Education

University of Washington, Seattle — *Seattle, WA, USA*

Ph.D. in Computer Science — *Sep 2018 - Present*

- Advisors: Shwetak Patel & Daniel McDuff
- Research Areas: Machine Learning, Mobile & Ubiquitous Computing, Healthcare

University of Massachusetts, Amherst — *Amherst, MA, USA*

B.S. in Computer Science — *Sep 2014 - June 2018*

- Advisor: Sunghoon Ivan Lee
- Graduated with Honors and Outstanding Undergraduate Achievement Award
- Research Area: Mobile Health

Professional Experience

2018-Now **UW Ubiquitous Computing Lab**, Graduate Research Assistant
2022 **Google Research & Fitbit + Consumer Health Research Team**, Student Researcher (Part-time)
2021 **Google Research & Fitbit + Consumer Health Research Team**, Research Intern
2021 **Microsoft Research + Human Understanding and Empathy Team**, Research Intern
2020-2021 **OctoML + Machine Learning System Team** , Research Intern (Part-Time)
2019 **Allen Institute for Artificial Intelligence (AI2)**, Research Intern
2016-2018 **UMass Amherst + Advanced Human Health Analytics Lab**, Undergraduate Research Assistant

Awards

2022 **Google PhD Fellowship Nominee (2 candidates per institution)**, Under Review
2018 **Glerum Family Endowed Fellowship**, University of Washington, Allen School
21st Century Leaders Award, Top 10 most exceptional graduating seniors, UMass Amherst
Outstanding Undergraduate Achievement Award, UMass Amherst, Computer Science

2017 **Rising Researcher Award**, Highest honor for undergraduate research, UMass Amherst
Outstanding Undergraduate Course Assistant Award, UMass Amherst, Computer Science
NSF Student Travel Award, National Science Foundation
Honors College Research Assistant Fellowship, UMass Amherst

2014-2018 **University Merit Director's Scholarship**, UMass Amherst

Publications

Under Review/Revision

[5] **Xin Liu**, Ziheng Jiang, Shwetak Patel, Daniel McDuff, "Federated Remote Physiological Measurement with Imperfect Data," *Preprint*

[4] **Xin Liu**, Brian Hill, Ziheng Jiang, Shwetak Patel, Daniel McDuff, "EfficientPhys: Enabling Simple, Fast, and Accurate Camera-Based Vitals Measurement," *Preprint*

[3] Brian Hill, **Xin Liu**, Daniel McDuff, "Learning Higher-Order Dynamics in Video-Based Cardiac Measurement," *Preprint*

[2] **Xin Liu**, Shwetak Patel, Daniel McDuff, "Camera-Based Physiological Sensing: Challenges and Future Directions," *Preprint*

[1] Yuang Li, Yuntao Wang, **Xin Liu**, Yuanchun Shi, Shao-Fu Shih, "Enabling Real-time On-chip Audio Super-Resolution for Bone Conduction Microphones," *Preprint*

Published

[13] **Xin Liu**, Yuntao Wang, Sinan Xie, Daniel McDuff, Shwetak Patel, "MobilePhys: Personalized Mobile Camera-Based Contactless Physiological Sensing," *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT/Ubicomp 2021)*

[12] Daniel McDuff, Javier Hernandez, **Xin Liu**, Erroll Wood, Tadas Baltrusaitis, "Using High-Fidelity Avatars to Advance Camera-based Cardiac Pulse Measurement," *IEEE Transactions on Biomedical Engineering 2022*

[11] Daniel McDuff, **Xin Liu**, Javier Hernandez, Erroll Wood, Tadas Baltrusaitis, "Synthetic Data for Multi-Parameter Camera-Based PhysiologicalSensing," *IEEE Engineering in Medicine and Biology Conference (EMBC 2021)*

[10] Chunjong Park, Morelle Arian, **Xin Liu**, Alex Mariakakis, Leon Sasson, Shwetak Patel, Tim Althoff, "Job Performance in Athletes and Salespeople: An Observational Study of Performance, Sleep, and Mobile App Usage," *The Web Conference (WWW 2021),*

[9] **Xin Liu**, Ziheng Jiang , Josh Fromm, Xuhai Xu, Shwetak Patel, Daniel McDuff, "MetaPhys: Few-Shot Adaptation for Non-Contact Physiological Measurement," *ACM Conference on Health, Inference, and Learning (ACM-CHIL 2021)*
Selected Media Coverage: [UW News], [ACM TechNews Headline], [IEEE Spectrum], [GeekWire]

[8] **Xin Liu**, Yuang Li, Josh Fromm, Ziheng Jiang, Yuntao Wang, Alex Mariakakis, Shwetak Patel, "SplitSR: An End-to-End Approach to Super-Resolution on Mobile Devices," *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT/Ubicomp 2021)*

[7] Xuhai Xu, Jiahao Li, Tianyi Yuan, Liang He, **Xin Liu**, Yukang Yan, Yuntao Wang, Yuanchuan Shi, Jennifer Mankoff, Anind Dey, "HulaMove: Using Commodity IMU for Waist Interaction," *ACM CHI Conference on Human Factors in Computing Systems (CHI 2021)*

[6] Kathrin Zürcher, Carl Morrow, Julien Riou, Marie Ballif, Anastasia Sideris Koch, Simon Bertschinger, **Xin Liu**, Manuja Sharma, Keren Middelkoop, Digby Warner, Robin Wood, Matthias Egger, Lukas Fenner "Novel approach to estimate tuberculosis transmission in primary care clinics in sub-Saharan Africa: protocol of a prospective study," *BMJ Open 2020)*

[5] **Xin Liu**, Josh Fromm , Shwetak Patel, Daniel McDuff, "Multi-Task Temporal Shift Attention Networks for On-Device Contactless Vitals Measurement," *Conference on Neural Information Processing Systems, (NeurIPS 2020)* [Oral, Top 1%, 105 out of 9454 Submissions]
Selected Media Coverage: [Microsoft Research Webinar], [Microsoft Blog], [ZDNet]

[4] Young Lee, **Xin Liu**, Jeremy Gummeson, Sunghoon Ivan Lee, "Towards the Ambulatory Assessment of Movement Quality in Stroke Survivors using a Wrist-worn Inertial Sensor," *IEEE International Conference on Biomedical and Health Informatics (IEEE BHI 2019)*

[3] Sunghoon Ivan Lee, **Xin Liu**, Smita Rajan, Nathan Ramasarma, Paolo Bonato, "A Novel Upper-Limb Function Measure Derived from Finger-Worn Sensor Data Collected in a Free-Living Setting," *PLOS ONE, vol. 14, no. 3, 2019*

[2] **Xin Liu**, Smita Rajan, Nathan Ramasarma, Paolo Bonato, Sunghoon Ivan Lee, "Finger-Worn Sensors for Accurate Functional Assessment of the Upper Limbs in Real-World Settings," *IEEE Engineering in Medicine and Biology Conference (IEEE EMBC 2018)*

[1] **Xin Liu**, Smita Rajan, Nathan Ramasarma, Paolo Bonato, Sunghoon Ivan Lee, "Finger-Worn Sensors for Accurate Functional Assessment of the Upper Limbs in Real-World Settings," *IEEE Journal of Biomedical and Health Informatics (J-BHI), vol.23, no.2, 2019)* [Cover Article Nominee]

Teaching Experience

Winter 2021/2022	**TECHIN 513 Managing Data and Signal Processing**, Teaching Assistant	*University of Washington*
Fall 2017	**CS328: Mobile Health & Sensing**, Teaching Assistant (*Outstanding Course Assistant Award*)	*UMass Amherst*

Mentoring

2020-Now	**Mentor at GIX Access Computing Program**, University of Washington & Tsinghua University	*Seattle, WA*
2021-Now	**Snehal Shokeen**, University of Washington, CS	*Seattle, WA*
2021-Now	**Xiaoyu Zhang**, Tsinghua University, CS	*Seattle, WA*
2020-Now	**Sinan Xie**, Tsinghua University, CS	*Seattle, WA*
2020-2021	**Tess Despres**, University of Washington, ECE, (Now Ph.D. Student at UC Berkeley EECS)	*Seattle, WA*
2020-2021	**Haojia Nie**, University of Waterloo, CS	*Seattle, WA*
2019-2020	**Yuang Li**, BUPT, China (Now at M.S. at University of Cambridge)	*Seattle, WA*
2019-2020	**Yongjoon Oh**, University of Washington, CSE (Now at Microsoft)	*Seattle, WA*

Academic Service & Outreach

Outreach

2019-2020	**UW Allen School PhD Visit Day** , Co-Organizer
2019-2020	**UW College of Engineering K-12 Discovery Day**, Volunteer
2018	**UMass Women in Engineering and Computing Career Day for High School Girls**, Volunteer

Academic Service

2020	**IEEE Journal of Biomedical and Health Informatics**, Reviwer
2020	**ACM CHI**, Reviwer
2020-2021	**ACM IWMUT/Ubicomp**, Reviwer
2021	**IEEE CVPR**, Reviwer
2021	**NeurIPS**, Reviwer
2021	**ICLR**, Reviwer
2021	**UIST**, Reviwer
2021	**ACII**, Reviwer
2021	**IEEE Transaction of Mobile Computing**, Reviwer