

Yaxing Yao

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Research Interests

Investigating people's privacy needs, expectations, and behaviors when interacting with computing systems and emerging technologies; Designing novel interfaces and systems to enhance people's privacy experiences; Studying the tension between different/conflicting privacy needs among multiple stakeholders; Promoting privacy equity for at-risk and underrepresented populations.

Keywords: Human-Computer Interaction; Usable Privacy; Internet of Things; Smart Homes; Artificial Intelligence; Virtual Reality; Design; Accessibility; At-Risk Populations; Qualitative Research; Quantitative Research; User Studies

Academic Appointments

Assistant Professor, Computer Science, Virginia Tech August 2023–Now
Assistant Professor, Information Systems, University of Maryland, Baltimore County Jan 2021–July 2023
Post-Doctoral Fellow, CyLab, Carnegie Mellon University Jan 2020–Dec 2020

Education

Ph.D. in Information Sciences, Syracuse University 2020
M.S. in Information Management, University of Washington 2014
B.S. in Business Administration, Harbin Institute of Technology 2012

Awards

IAPP SOUPS Privacy Award, SOUPS 2021
Doctoral Dissertation Award, Syracuse University 2020
Best Paper Honorable Mention Award, ACM CSCW 2019
Best Paper Award, HICSS 2019
Katzner Research Award, Syracuse University 2016
Graduate School Award for Excellence and Innovation, University of Washington 2014
Mary Hotchkiss Endowed Fellowship, University of Washington 2014

Grants

Google PSS Faculty Award (\$75K), PI 2023
NSF HCC SMALL Core on Avatar Accessibility in VR (\$600K), Co-PI 2023
NSF SaTC SMALL Core on Privacy Negotiation (\$600K), Lead PI 2023
Meta Research Grant on Privacy Predictors in Virtual Reality (\$100,000), Co-PI 2022
Meta Research Grant on Privacy Notice in Virtual Reality (\$75,000), PI 2022
UMBC SUFF Grant (\$6,000), PI 2021
UMBC START Grant (\$25,000), PI 2021
NSF I-Corp Grant (\$50,000), Entrepreneurial Lead 2018

Full Publications

* indicates the students who I closely mentored and worked with

[C38] *Liu, L., Gao, L., **Yao, Y.** Exploring Design Opportunities for Family-Based Privacy Education in Informal Learning Spaces. To appear at PoPETS 2024.

- [C37] Chen, C., Li, W., Song, W., Ye, Y., **Yao, Y.**, Li, T. An Empathy-Based Sandbox Approach to Bridge the Privacy Gap among Attitudes, Goals, Knowledge, and Behaviors. To appear at CHI 2024.
- [C36] Alghythee, K., Hrcic, A., Singh, K., Kunisetty, S., **Yao, Y.**, Soni, N. Towards Understanding Family Privacy and Security Literacy Conversations at Home: Design Implications for Privacy Literacy Interfaces. To appear at CHI 2024.
- [C35] Feng, Y., Ravichander, A., **Yao, Y.**, Zhang, S., Chen, R., Wilson, S., Sadeh, N. Understanding How to Inform Blind and Low-Vision Users about Data Privacy through Privacy Question Answering Assistants. To appear at USENIX Security 2024.
- [C34] *Deldari, E., *Thakkar, P., **Yao, Y.** Users' Perceptions of Online Child Abuse Detection Mechanisms. To appear at CSCW 2024.
- [C33] *Zhou, M., Qu, Z., Wan, J., Wen, B., **Yao, Y.**, Lu, Z. Understanding Chinese Internet Users' Perceptions of, and Online Platforms' Compliance with, the Personal Information Protection Law (PIPL). To appear at CSCW 2024.
- [C32] *Lu, Y., Zhang, C., Yang, Y., **Yao, Y.**, Li, T. From Awareness to Action: Exploring End-User Empowerment Interventions for Dark Patterns in UX. To appear at CSCW 2024.
- [C31] *Zhang, K., *Deldari, E., **Yao, Y.**, Zhao, Y. (2023). A Diary Study in Social Virtual Reality: Impact of Avatars with Disability Signifiers on the Social Experiences of People with Disabilities. In Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS'23).
- [C30] *Wang, Z., Huang, D., **Yao, Y.** (2023). Exploring Tenants' Preferences of Privacy Negotiation in Airbnb. In Proceedings of 32nd USENIX Security Symposium (USENIX Security'23).
- [C29] *Deldari, E., Freed, D., Poveda, J., **Yao, Y.** (2023). An Investigation of Teenager Experiences in Social Virtual Reality from Teenagers', Parents', and Bystanders' Perspectives. In Proceedings of 19th Symposium on Usable Privacy and Security (SOUPS'23).
- [C28] *Wen, Z., *Jia, J., Yan, H., **Yao, Y.**, Liu, Z., Dong, C. (2023). The Influence of Explanation Designs on User Understanding Differential Privacy and Making Data-sharing Decision. Information Sciences.
- [C27] *Le, T., *Wang, A., **Yao, Y.**, Feng, Y., Heydarian, A., Sadeh, N., Tian, Y. (2023). Exploring Smart Commercial Building Occupants' Perceptions and Notification Preferences of Internet of Things Data Collection in the United States. In Proceedings at the 8th IEEE European Symposium on Security and Privacy (Euro S&P 2023).
- [C26] Cruz, S., Danek, L., Liu, S., Kraemer, C., Wang, Z., Feamster, N., Huang, D., **Yao, Y.**, Heste, J. Toward Identifying Home Privacy Leaks Using Augmented Reality. In Proceedings of the Usable Security and Privacy (USEC) Symposium 2023.
- [C25] Zhao, Y., **Yao, Y.**, *Fu, J., *Zhou, N. "If sighted people know, I should be able to know:" Privacy Perceptions of Bystanders with Visual Impairments around Camera-based Technology. In Proceedings of 32nd USENIX Security Symposium (USENIX Security'23).
- [C24] *Zhang, K., *Deldari, E., Lu, Z., **Yao, Y.**, Zhao, Y. "It's Just Part of Me:" Understanding Avatar Diversity and the Self-presentation of People with Disabilities in Social Virtual Reality. In Proceedings of the 24th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS'22).
- [C23] *Zhang, A., Feng, Y., **Yao, Y.**, Cranor, L.F., Sadeh, N. How Usable Are iOS App Privacy Labels? In Proceedings of Privacy Enhancing Technologies (PoPETS'22).
- [C22] *Thakkar, P., *He, S., *Xu, S., Huang, D.Y., **Yao, Y.** "It would probably turn into a social faux-pas": Users' and Bystanders' Preferences of Privacy Awareness Mechanisms in Smart Homes. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI'22).

- [C21] *Jin, H., Guo, B., Roychoudhury, R., **Yao, Y.**, Kumar, S., Agarwal, Y., Hong, J.I. Exploring the Needs of Users for Supporting Privacy-Protective Behaviors in Smart Homes. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI'22).
- [C20] *Wang, Y., Zuest, P., **Yao, Y.**, Lu, Z., Wattenhofer, R. Impact and User Perception of Sandwich Attacks in the DeFi Ecosystem. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI'22).
- [C19] *Story, P., *Smullen, D., Chen, R., **Yao, Y.**, Acquisti, A., Cranor, L.F., Sadeh, N. and Schaub, F., 2022. Increasing Adoption of Tor Browser Using Informational and Planning Nudges. In Proceedings on Privacy Enhancing Technologies (PoPETS'22).
- [C18] *Smullen, D., **Yao, Y.**, Feng, Y., Sadeh, N., Edelstein, A., and Weiss, R. Managing Potentially Intrusive Practices In The Browser: A User-Centered Perspective. In Proceedings on Privacy Enhancing Technologies (PoPETS'21).
- [C17] *Story, P., *Smullen, D., **Yao, Y.**, Acquisti, A., Cranor, L. F., Sadeh, N., and Schaub, F. Awareness, Adoption, and Misconceptions of Web Privacy Tools. In Proceedings on Privacy Enhancing Technologies (PoPETS'21).
- [C16] *Kaushik, S., **Yao, Y.**, Dewitte, P., Wang, Y. "How I Know For Sure": People's Perspectives on Solely Automated Decision-Making (SADM). In Proceedings at the Symposium on Usable Privacy and Security (SOUPS'21).
IAPP SOUPS Privacy Award
- [C15] Feng, Y., **Yao, Y.**, and Sadeh, N. A Design Space for Privacy Choices: Towards Meaningful Privacy Control in the Internet of Things. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI'21). ACM.
- [C14] Habib, H., Zou, Y., **Yao, Y.**, Acquisti, A., Cranor, L. F., Reidenberg, J., Sadeh, N., and Schaub, F. Toggle, Dollar Signs, and Triangles: How to (In)Effectively Convey Privacy Choices with Icons and Link Texts. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI'21). ACM.
- [C13] **Yao, Y.**, Basdeo, J. R., Mcdonough, O. R., Wang, Y. Privacy Perceptions and Designs of Bystanders in Smart Homes. In Proceedings of the ACM on Human-Computer Interaction (CSCW'19).
Best Paper Honorable Mention Award
- [C12] Huang, Y., Sang, Y., Wu, Q., **Yao, Y.** Higher Education Check-Ins: Exploring the User Experience of Hybrid Location Sensing. In Proceedings of the ACM on Human-Computer Interaction (CSCW'19).
- [C11] Barbosa, N. M., Park, J. S., **Yao, Y.**, Wang, Y. "What if?" Predicting Individual Users' Smart Home Privacy Preferences and Their Changes. In Proceedings on Privacy Enhancing Technologies (PoPETS'19).
- [C10] **Yao, Y.**, Basdeo, J., Kaushik, S., and Wang, Y. Defending My Castle: A Co-Design Study of Privacy Mechanisms for Smart Homes. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI'19). ACM.
- [C9] **Yao, Y.**, Huang, Y., Wang, Y. Unpacking People's Understandings of Bluetooth Beacon Systems-A Location-Based IoT Technology. In Proceedings of the 52nd Hawaii International Conference on System Sciences (HICSS'19). (Best Paper Nomination)
- [C8] **Yao, Y.**, Xia, H., Huang, Y. and Wang, Y., 2017, May. Privacy mechanisms for drones: Perceptions of drone controllers and bystanders. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI'17).

- [C7] **Yao, Y.**, Xia, H., Huang, Y. and Wang, Y., 2017, May. Free to fly in public spaces: Drone controllers' privacy perceptions and practices. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI'17).
- [C6] **Yao, Y.**, Lo Re, D. and Wang, Y., 2017, February. Folk models of online behavioral advertising. In Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW'17).
- [C5] Wang, Y., Xia, H., **Yao, Y.**, Huang, Y. Flying Eyes and Hidden Controllers: A Qualitative Study of People's Privacy Perceptions of Civilian Drones in the US. Proceedings on Privacy Enhancing Technologies (PoPETS'16).
- [C4] Scholl, H. J., Wang, K., Wang, Y., Woods, G., Xu, D., **Yao, Y.**, Krcmar, H. (2014). Top soccer teams in cyberspace: Online channels for services, communications, research, and sales. Journal of Marketing Analytics, 2(2), 98-119.
- [C3] Huang, Y., Huo, S., **Yao, Y.**, Chao, N., Wang, Y., Grygiel, J. and Sawyer, S., 2016, June. Municipal police departments on Facebook: What are they posting and are people engaging?. In Proceedings of the 17th International digital government research conference on digital government research (DGO'16).
- [C2] Guajardo, V., **Yao, Y.**, Bayo Urban, I. and Gomez, R. (2014). CasaCare.org: A sociotechnical platform for women immigrant workers in the home care industry. 11th Community Informatics Conference CIRN, Prato, Italy, October 2014.
- [C1] Jurisch, M., Krcmar, H., Scholl, H. J., Wang, K., Wang, Y., Woods, G., Xu, D., **Yao, Y.** Digital and social media in pro sports: analysis of the 2013 UEFA top four. In Proceedings of the 47th Hawaii International Conference on System Sciences (HICSS'13).

Book Chapter

- [B1] Lipford, H.R., Tabassum, M., Bahirat, P., **Yao, Y.** and Knijnenburg, B.P., 2022. Privacy and the Internet of Things. In Modern Socio-Technical Perspectives on Privacy (pp. 233-264). Springer, Cham.

Workshop Organized

- [W10] Akter, T., Calandrino, J., Coventry, L., Das, S., Hoyle, R., Marsh, A., Qin, L., Sannon, Shruti., Munyaka, I., Sharma, T., Kaushik, S., Wang, Y., **Yao, Y.** 7th Workshop on Inclusive Privacy and Security (WIPS) – Privacy and Security for Everyone, Anytime, Anywhere. In the 18th Symposium on Usable Privacy and Security (SOUPS'22).
- [W9] Ahmed, T., Barbosa, N. M., Calandrino, J., Coventry, L., Lerner, A., Marsh, A., Wang, Y., **Yao, Y.** 6th Workshop on Inclusive Privacy and Security (WIPS) – Privacy and Security for Everyone, Anytime, Anywhere. In the 17th Symposium on Usable Privacy and Security (SOUPS'21).
- [W8] Vitak, J., Zimmer, M., Lenhart, A., Park, S., Y. Wong, R. and **Yao, Y.**, 2021, October. Designing for Data Awareness: Addressing Privacy and Security Concerns About “Smart” Technologies. In Companion Publication of the 2021 Conference on Computer Supported Cooperative Work and Social Computing (CSCW'21).
- [W7] Ahmed, T., Barbosa, N. M., Calandrino, J., Coventry, L., Lerner, A., Marsh, A., Wang, Y., **Yao, Y.** 5th Workshop on Inclusive Privacy and Security (WIPS) – Privacy and Security for Everyone, Anytime, Anywhere. In the 16 th Symposium on Usable Privacy and Security (SOUPS'20).
- [W6] **Yao, Y.**, Chouhan, C., Wong, R., Emami-Naeini, P., Merrill, N., Page, X., Wang, Y., Wisniewski, P. Ubiquitous Privacy: Research and Design for Mobile and IoT Platforms. To appear at Companion of the 2019 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW'19).

- [W5] Ahmed, T., Barbosa, N. M., Calandrino, J., Coventry, L., Lerner, A., Marsh, A., Wang, Y., **Yao, Y.** 4th Workshop on Inclusive Privacy and Security (WIPS) – Privacy and Security for Everyone, Anytime, Anywhere. In the 15th Symposium on Usable Privacy and Security (SOUPS'19).
- [W4] Badillo-Urquiola, K., **Yao, Y.**, Ayalon, O., Knijnenburg, B., Page, X., Toch, E., Wang, Y., Wisniewski, P. J. (2018, October). Privacy in Context: Critically Engaging with Theory to Guide Privacy Research and Design. In Companion of the 2018 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW'18).
- [W3] **Yao, Y.** Exploring a Speculative Design Approach for Inclusive Privacy and Security. 3rd Workshop on Inclusive Privacy and Security (WIPS). In the 14th Symposium on Usable Privacy and Security (SOUPS'18).
- [W2] Wang, Y., **Yao, Y.**, Whose Privacy? The Case of Drone Controllers and Bystanders. Networked Privacy Workshop of the ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW'17).
- [W1] **Yao, Y.**, Personalized Privacy Assistant to Protect People's Privacy in Smart Home Environment. Networked Privacy Workshop of the ACM Conference on Human Factors in Computing Systems (CHI'2018).

Poster Publications

- [P9] Chen, Y., Jones, J., **Yao, Y.** (2020, October) WireOn: Supporting Remote Collaboration for Embedded System Development. In Proceedings of the Conference Companion Publication of the 2020 on Computer Supported Cooperative Work and Social Computing (CSCW'20).
- [P8] Huang, Y., Sang, Y., Wu, Q., **Yao, Y.** (2019, April). Studying User Experience of a Hybrid Location Sensing System. In Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (CHI'19).
- [P7] Huang, Y., Wu, Q., **Yao, Y.** (2018, October). Bluetooth Low Energy (BLE) Beacons Alone Didn't Work!. In Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers (UbiComp'18).
- [P6] **Yao, Y.**, Bort, J., Huang, Y. (2017, May). Understanding Danmaku's Potential in Online Video Learning. In Proceedings of the 2017 CHI conference extended abstracts on human factors in computing systems (CHI'17).
- [P5] **Yao, Y.**, Huang, Y., Wang, Y. Unpacking People's Understandings of Bluetooth Beacon. The 14th Symposium on Usable Privacy and Security (SOUPS'18).
- [P4] **Yao, Y.**, Xia, H., Kaushik, S., Wang, Y. Design and Evaluation of an Information-Based Web Tracking Blocking Mechanism. The Federal Trade Commission PrivacyCon, Washington D.C., February 2018.
- [P3] **Yao, Y.**, Xia, H., Kaushik, S., Wang, Y. Design and Evaluation of an Information-Based Web Tracking Blocking Mechanism. Great Lake Security Day. 2017.
- [P2] Huang, Y., **Yao, Y.**, Bort, J., Wu, Q., Danmaku: Understanding its Usage in China and its Broader Potential. CSCW in China and Beyond Workshop of the ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW'17).
- [P1] Wang, Y., Xia, H., **Yao, Y.**, Huang, Y. Flying Eyes and Hidden Controllers: A Qualitative Study of People's Privacy Perceptions of Civilian Drones in the US. The 12th Symposium on Usable Privacy and Security (SOUPS'16).

Magazine Articles

- [M1] Walker, A.M., **Yao, Y.**, Geeng, C., Hoyle, R. and Wisniewski, P., 2019. Moving beyond 'one size fits all' research considerations for working with vulnerable populations. *Interactions*, 26(6), pp.34-39.

Invited Talks and Panels

- [T6] “Panel: Privacy and Cybersecurity for Vulnerable Populations”, ABA Antitrust Section Spring Meeting, Washington D.C.
- [T5] “Supporting a Healthy and Safety Environment for Teenagers in Social VR”, Johns Hopkins University
- [T4] “Privacy for Whom? A Multi-Stakeholder Exploration of Privacy Designs”, University of Maryland, HCIL Brown Bag Series
- [T3] “Human-Centered Perspectives on Privacy and Security Harms in the Smart Home”, UC Berkeley
- [T2] “Privacy for Whom? A Multi-Stakeholder Exploration of Privacy Designs”, Tsinghua University
- [T1] “‘What if?’ Predicting Individual Users’ Smart Home Privacy Preferences and Their Changes.” Federal Trade Commission (FTC) PrivacyCon, Washington D.C., 2019.

Teaching

Instructor

- HCC 629: Fundamentals in Human-Centered Computing, Instructor, Spring 2021
- HCC 800 Research Seminar: Privacy Law, Technology, and Design, Instructor, Fall 2021
- HCC 613: User Interface Prototyping, Spring 2022
- IS 303: Fundamentals of Human-Computer Interaction, Instructor, Spring 2023

Students Advising

Current Ph.D. Students

- Elmira Deldari (UMBC, Jan. 2022 - now)

Current Master Students

- Parth Thakkar (UMBC, Jun. 2021 - now)
- Zixin Wang (Zhejiang University, Jun. 2022 - now)

Current Undergraduate Students

- Daniel Bajulaiye (UMBC, Jan. 2021 - now)

Past Students

- Elizabeth Louie (CMU)
- Kexin Zhang (U. of Wisconsin - Madison, now master student at Cornell)
- Peter Story (CMU, now Assistant Professor at Clark University)
- Daniel Smullen (CMU, now Research Scientist at Amazon)
- Shijing He (Cisco, now PhD student at UCL)
- Shiyu Xu (U. of Michigan)
- Akashth Jain (CMU, now at Apple)
- Prashanth Mogali (CMU, now at Facebook)
- Smirity Kaushik (Syracuse, now PhD student at UIUC)

Services

Organizing Committee

- Workshop Co-Chair, SOUPS 2022, 2023
- Publicity Co-Chair, SOUPS 2020, 2021
- Organizer, Networked Privacy Workshop, CSCW 2018,2019, 2021
- Lead organizer, Inclusive Privacy and Security Workshop (WIPS@SOUPS), 2019, 2020, 2021, 2022

Program Committee/Associate Editor

- CHI 2021, 2022, 2023
- CSCW 2020, 2021, 2022, 2023
- PoPETS 2022

- SOUPS 2022, 2023
- GROUPS 2020
- CHI Late-Breaking Work 2017, 2019, 2020

Editor

- IEEE Pervasive Computing Special Issue on Privacy Surveillance, 2021-2022

Reviewers

- ACM CHI 2016, 2017, 2018, 2019, 2020
- ACM CHI Late-Breaking Work 2017, 2018, 2019
- ACM CSCW 2016, 2017, 2018, 2019
- iConference 2016, 2017, 2018, 2019
- PoPETS 2016
- SOUPS 2016, 2017, 2018, 2021
- IEEE Security Privacy 2018, 2021
- ICIS 2018
- USEC 2019
- IMWUT 2019, 2022
- ACM GROUP 2020
- JASIST

Dissertation Committee Member

- Elmira Deldari (UMBC)
- HIRAK RAY (UMBC)
- Wei Bai (UMBC)
- Sunyup Park (UMD)
- Peter Story (CMU)
- Daniel Smullen (CMU)