

RESEARCH INTERESTS

My research lies at the intersection of human-computer interaction, privacy, and mobile systems, focusing primarily on two **conflicting** questions:

- **Sensing:** How can we build sensor-based systems to improve our lives?
- **Privacy:** How can we make it easier for users, developers, and auditors to protect data privacy?

I use the feedback from each domain to promote the other and build my unique advantages:

- **Treat privacy as a first-class citizen.** When designing a new sensing system, I often start with the best privacy practice and develop novel solutions to overcome other challenges.
- **Protect privacy while respecting legitimate needs.** My sensing research allows me to understand the strength and weaknesses of different privacy-intrusive technologies. So I can design privacy protections that balance the interests of users, developers, and auditors.

EDUCATION

Human Computer Interaction Institute, Carnegie Mellon University Pittsburgh, PA, USA
Ph.D. Student. Advisor: Dr. Jason I. Hong & Dr. Swarun Kumar since 2016
Thesis: **Mitigating Data Overaccess by Apps through Modular Privacy Flows**

Emory University Atlanta, GA, USA
M.S. Computer Science 2011 - 2012

Huazhong Univ. of Science & Technology China
B.S. Software Engineering 2006 - 2010

SELECTED RECOGNITIONS

Rising Star in Data Science by the University of Chicago Center for Data and Computing 2021

Featured in Communications of the ACM (CACM), Research Highlight (RH) 2021
- 12-24 papers are selected annually as the most significant results among all papers published in computing by the CACM-RH editorial board.

Qualcomm Innovation Fellowship Finalist 2021

UbiComp Gaetano Borriello Outstanding Student award 2020
- This award is given to one graduate student annually across the world “who has made outstanding research contributions to the field of ubiquitous computing”. The awardee is selected by the conference’s Steering Committee based on publication records, service to the community, and a submitted research statement.

Featured in ACM GetMobile Research Highlight. 2020
- 16 papers of high quality and broad appeal are selected annually from all SIGMOBILE sponsored conferences.

Best Wearable Long Paper, Ubicomp & ISWC. 2020

Best Hardware Award, The 7th CMU Summit Venture Competition (1/125). 2018

Best Demo Honorable Mention (2/51), Ubicomp & ISWC. 2018

Yahoo! Patent Milestone Award (for 5+ patents) 2014

Best Paper Honorable Mention Award, ACM MobileHCI. 2014

Notable Computing Books and Articles of 2013, ACM Computing Reviews. 2013

China Champion (1/500+), 2008
Ranked 4th in the World Final (Paris, France), Microsoft Imagine Cup Software Design Competition
- Microsoft ImagineCup is an annual competition that calls students worldwide to create technology solutions that can help address some of the world's toughest social challenges. The theme of 2008 was "Imagine a world where technology enables a sustainable environment." More than 200,000 students from over 100 countries and regions participated in the competition, competing for \$240,000 in prize money.

EMPLOYMENT

Carnegie Mellon University Pittsburgh, PA. Ph.D. student & Research assistant	2016 - present
Yahoo! Labs Sunnyvale, CA. Research engineer	2013 - 2016
Robert Bosch Research Center Palo Alto, CA. Research intern	2013 & 2011
Microsoft Research Asia Beijing, China. Research intern	2012 & 2010
Intelligent Information Access Lab, Emory University Atlanta, GA. Master's student & Research assistant	2011 - 2012
Institute of Computing Technology, Chinese Academy of Sciences Beijing, China. Summer visiting student & Research assistant	2009

PUBLICATIONS

Google Scholar: <https://scholar.google.com/citations?user=Iivlh5AAAAJ&hl=en>

In Submission

- [U.3] Anonymized title.
Haojian Jin, Gram Liu, David Hwang, Swarun Kumar, Yuvraj Agarwal, Jason Hong.
In preparation. 14 pages.
- [U.2] Anonymized title.
Haojian Jin, Bill Guo, Yaxing Yao, Swarun Kumar, Yuvraj Agarwal, Jason Hong.
Under revise and resubmit to CHI'22. 22 pages.
- [U.1] Anonymized title.
Haojian Jin, Gram Liu, David Hwang, Swarun Kumar, Yuvraj Agarwal, Jason Hong.
Under major revision at IEEE Symposium on Security and Privacy (Oakland) '22. 18 pages.

Conference & Journal-first Papers

- [C.17] Lean Privacy Review: Collecting Users' Privacy Concerns of Data Practices at a Low Cost.
Haojian Jin, Hong Shen, Mayank Jain, Swarun Kumar, Jason Hong.
TOCHI 2021: ACM Trans. Comput. -Hum. Interact. 28, 5, Article 34, 55 pages. [*pdf*] [*website*]
- [C.16] Designing Alternative Representations of Confusion Matrices to Support Non-Expert Public Understanding of Algorithmic Outputs and Performance.
Hong Shen, **Haojian Jin**, Ángel Alexander Cabrera, Adam Perer, Nina Balcan, Jason Hong.
CSCW 2020: Proc. ACM Hum.-Comput. Interact. 4, CSCW2, Article 153, 22 pages. [*pdf*]
- [C.15] 'I Can't Even Buy Apples If I Don't Use Mobile Pay?' When Mobile Payments Become Infrastructural in China
Hong Shen, Cori Faklaris, **Haojian Jin**, Laura Dabbish, Jason Hong.
CSCW 2020: Proc. ACM Hum.-Comput. Interact. 4, CSCW2, Article 170, 26 pages. [*pdf*]

- [C.14] Software-define Cooking using a Microwave oven.
Haojian Jin, Jingxian Wang, Swarun Kumar, Jason Hong.
MobiCom 2019: Annual International Conference on Mobile Computing and Networking, 16 pages. [pdf]
Featured in ACM GetMobile Research Highlight.
Featured in Communications of the ACM (CACM) – Research Highlights [website] [video]
This project leads to a 0.5 million NSF grant: CNS Core: Small: Harnessing Wireless Actuation.
- [C.13] RFID Tattoo: A Wireless Platform for Speech Recognition
 Jingxian Wang, Chengfeng Pan, **Haojian Jin**, Vaibhav Singh, Jason Hong, Carmel Majidi, Swarun Kumar.
IMWUT 2019 / UbiComp 2020: ACM Conference on Pervasive and Ubiquitous Computing, 24 pages [pdf]
UbiComp & ISWC 2020 Best Wearable Long Paper.
- [C.12] Sozu: Self-Powered Radio Tags for Building-Scale Activity Sensing
 Yang Zhang, Yasha Iravantchi, **Haojian Jin**, Swarun Kumar, Chris Harrison.
UIST 2019: 32nd ACM User Interface Software and Technology Symposium, 13 pages [pdf] [video]
- [C.11] Pushing the Range Limits of Commercial Passive RFIDs
 Jingxian Wang, Junbo Zhang, Rajarshi Saha, **Haojian Jin**, Swarun Kumar.
NSDI 2019: USENIX Symposium on Networked Systems Design and Implementation, 16 pages [pdf]
- [C.10] "Why are they collecting my data?": Inferring the Purposes of Network Traffic in Mobile Apps
Haojian Jin, Minyi Liu, Kevan Dohia, Yuanchun Li, Gaurav Kumar Srivastava, Matthew Fredrikson, Yuvraj Agarwal, Jason Hong.
IMWUT 2018 / UbiComp 2019: ACM Conference on Pervasive and Ubiquitous Computing, 27 pages [pdf]
- [C.9] WiSh: Towards a Wireless Shape-aware World using Passive RFIDs.
Haojian Jin*, Jingxian Wang*, Zhijian Yang, Swarun Kumar, Jason Hong.
MobiSys 2018: ACM Conference on Mobile Systems, Applications, and Services, 14 pages. [pdf] [video]
- [C.8] Towards Wearable Everyday Body-Frame Tracking using Passive RFIDs.
Haojian Jin, Zhijian Yang, Swarun Kumar, Jason Hong.
IMWUT 2017 / UbiComp 2018: ACM Conference on Pervasive and Ubiquitous Computing, 23 pages [pdf] [video]
Best Demo Honorable Mention (2/51).
This project leads to a 0.5 million NSF grant: NeTS: Small: Handheld mm-Accurate Positioning for Wearables.
- [C.7] ElasticPlay: Responsive Video Summarization with Dynamic Time Budgets.
Haojian Jin, Yale Song, Koji Yatani.
ACMMM 2017: ACM Conference on Multimedia, 9 pages. [pdf] [video] [live demo]
Oral Presentation, top 7 %.
- [C.6] Finding Weather Photos: Community-Supervised Methods for Editorial Curation of Online Sources.
 David Shamma, Lyndon Kennedy, Jia Li, Bart Thomee, **Haojian Jin**, Jeff Yuan.
CSCW 2016: ACM Conference on Computer Supported Cooperative Work, 11 pages. [pdf]
- [C.5] Corona: Positioning Adjacent Device with Asymmetric Bluetooth Low Energy RSSI Distributions.
Haojian Jin, Xu Cheng, Kent Lyons.
UIST 2015: ACM Symposium on User Interface Software and Technology, 5 pages. [pdf] [video]
- [C.4] Tracko: Ad-hoc Mobile 3D Tracking Using Bluetooth Low Energy and Inaudible Signals for Cross-Device Interaction.
Haojian Jin, Christian Holz, Kasper Hornbæk.
UIST 2015: ACM Symposium on User Interface Software and Technology, 10 pages. [pdf] [video]
- [C.3] The Cohort and Speechify Libraries for Rapid Construction of Speech Enabled Applications for Android.
 Tejaswi Kasturi, **Haojian Jin**, Aasish Pappu, Sungjin Lee, Beverley Harrison, Ramana Murthy, Amanda Stent.
SIGDIAL 2015: ACM SIGDIAL Meeting on Discourse and Dialogue, 3 pages. [pdf]
- [C.2] ReviewCollage: A Mobile Interface for Direct Comparison Using Online Reviews.
Haojian Jin, Tetsuya Sakai, Koji Yatani.
MobileHCI 2014: ACM Conference on Human-Computer Interaction with Mobile Devices and Services, 10 pages.
Best Paper Honorable Mention Award, top 5%. [pdf] [video]
- [C.1] Predicting Web Search Relevance from Touch Interactions on Mobile Devices.
 Qi Guo, **Haojian Jin**, Dmitry Lagun, Shuai Yuan, Eugene Agichtein.

SIGIR 2013: ACM SIGIR conference on Research and development in information retrieval, 10 pages.
Notable Computing Books and Articles of 2013, ACM Computing Reviews. [pdf]

Workshop & posters & demos & technical Reports

- [E.9] Sensor as a Company: On Self-Sustaining IoT Commons
Haojian Jin, Swarun Kumar, Jason Hong.
Technical Report, 2021 [pdf]
- [E.8] The Design of the User Interfaces for Privacy Enhancements for Android
Jason I. Hong, Yuvraj Agarwal, [et al, including **Haojian Jin**]
Technical Report, 2021 [pdf]
- [E.7] RFID Tattoo: A Wireless Platform for Speech Recognition
Jingxian Wang, Chengfeng Pan, **Haojian Jin**, Vaibhav Singh, Jason Hong, Carmel Majidi, Swarun Kumar.
IJCAI 2021 Sister Conferences Best Papers
- [E.6] Providing Architectural Support for Building Privacy-Sensitive Smart Home Applications.
Haojian Jin, Swarun Kumar, Jason Hong.
UbiComp 2020 Doctoral Colloquium
- [E.5] SDC: Software-define Cooking using a Microwave oven.
Haojian Jin, Jingxian Wang, Swarun Kumar, Jason Hong.
MobiCom 2019 Demo
- [E.4] RFWear: Towards Wearable Everyday Body-Frame Tracking using Passive RFIDs.
Haojian Jin, Jingxian Wang, Zhijian Yang, Swarun Kumar, Jason Hong.
UbiComp 2018 Demo, **Best Demo Honorable Mention (2/51)**.
- [E.3] Enhancing Email Functionality using Late Bound Content.
Haojian Jin, Vita Chen, Ritwik Rajendra, Jason Hong.
Technical Report [pdf] [video]
- [E.2] Advances and Challenges in Ad-hoc Mobile Tracking for Seamless Interaction across Commodity Devices.
Haojian Jin, Christian Holz.
CHI 2016 Workshop: Cross-Surface 2016.
- [E.1] Towards Estimating Web Search Result Relevance from Touch Interactions on Mobile Devices.
Qi Guo, **Haojian Jin**, Dmitry Lagun, Shuai Yuan, Eugene Agichtein.
CHI EA 2013: CHI '13 Extended Abstracts on Human Factors in Computing Systems.

Magazine articles

- [M.2] Software-define Cooking using a Microwave oven.
Haojian Jin, Jingxian Wang, Swarun Kumar, Jason Hong.
Research Highlight, Communications of the ACM. Issue 12 December 2021
- [M.1] Software-define Cooking using a Microwave oven.
Haojian Jin, Jingxian Wang, Swarun Kumar, Jason Hong.
Research Highlight, ACM GetMobile. Volume 23, Issue 4 December 2019

PATENTS

Google Patent: <https://patents.google.com/?inventor=Haojian+Jin>

Granted

- [G.7] **Haojian Jin**, Zheng Wen, Yale Song. Content-adaptive digital content adjustment method and system, Granted in Apr. 2018, U.S. Patent number 9,942,581.

- [G.6] Christian Holz, **Haojian Jin**. System and method for 3D tracking for ad-hoc cross-device interaction, Granted in Mar. 2018, US Patent number 9,929,817.
- [G.5] **Haojian Jin**, Christian Holz. System and method for detection of indoor tracking units, Granted in Nov. 2017, US Patent number 9,813,854.
- [G.4] Christian Holz, Marius Knaust, Rajiv Ayyangar, Senaka Buthpitiya, **Haojian Jin**. User authentication and data encryption, Granted in Nov. 2017, US Patent 9,817,956.
- [G.3] **Haojian Jin**, Kent Lyons, Cheng Xu. System and method for device positioning with bluetooth low energy distributions, Granted in Mar. 2017, U.S. Patent number 9,602,956.
- [G.2] Jia Li, **Haojian Jin**. Mobile device image acquisition using objects of interest recognition, Granted in January 2017, US Patent number 9,554,030.
- [G.1] **Haojian Jin**, Christian Holz. System and method for calibrating bluetooth low energy signal strengths, Granted in July, 2016, US Patent number 9,385,821.

Pending¹

- [P.5] **Haojian Jin**, Zhijian Yang, Swarun Kumar, Jason Hong. System and method for tracking a body, Published in 2019.
- [P.4] **Haojian Jin**, Jingxian Wang, Swarun Kumar, Jason Hong. System and method for tracking a shape, Published in 2019.
- [P.3] **Haojian Jin**, Jingxian Wang, Swarun Kumar, Jason Hong. System and Method for Heating an Item in a Microwave Oven, Published in 2020.
- [P.2] Jingxian Wang, Swarun Kumar, Jason I. Hong, Carmel Majidi, Chengfeng Pan, **Haojian Jin**, Vaibhav Singh, Yash Jain, RFID Tattoo: A Wireless Platform for Speech Recognition, Filed in 2019
- [P.1] Jingxian Wang, Swarun Kumar, **Haojian Jin**, Junbo Zhang, Rajarshi Saha Distributed Long-range Wireless Powering System for Commercial Passive RFID/Backscatter Tags, Filed in 2018

GRANTS

Research Gift from Cisco, Edge Computing

2021

Amount: \$100,000
 Link: <https://research.cisco.com/research#rfp-202103>
 Project: "Peekaboo: Providing Architectural Support for Building Privacy-sensitive Smart Home Apps"
 PI: Jason Hong, Yuvraj Agarwal, Swarun Kumar
 Role: Conceived the initial idea, conducted the research before the grant application (U.1, P. 6), and wrote the proposal with Prof. Hong, Prof. Agarwal, Prof. Kumar.

NSF, Division Of Computer and Network Systems, Small, #2007786

2020

Amount: \$513,200
 Link: https://nsf.gov/awardsearch/showAward?AWD_ID=2007786
 Project: "Harnessing Wireless Actuation"
 PI: Swarun Kumar
 Role: Conceived the initial idea, conducted the research before the grant application (C.14).

NSF, Division Of Computer and Network Systems, Small, #1718435

2017

Amount: \$499,999
 Link: https://nsf.gov/awardsearch/showAward?AWD_ID=1718435
 Project: "Handheld mm-Accurate Positioning for Wearables"
 PI: Swarun Kumar
 Role: Conceived the initial idea with Prof. Kumar, conducted the research before the grant application (C.8).

¹Recently filed patents are not listed (only patents filed more than 18 months ago have been published by the USPTO).

TEACHING

Programming Usable Interfaces

Fall 2020

Course description	CMU 05-430 / 05-630 [Course link] [Syllabus]
Class size	91 students in total, 14 students in my section (4 undergraduate, 10 graduate)
Role	Co-Instructor/TA
Responsibilities	Develop the course materials, teach weekly 2-hour recitation sessions, host weekly office hours, help students design projects, answer final exam questions, and grade assignments and exams.

User-Centered Research & Evaluation

Fall 2019

Course description	CMU 05-410 / 05-610 [Course link] [Syllabus]
Class size	84 students in total, 17 students in my section (4 undergraduate, 13 graduate)
Role	Co-Instructor/TA
Responsibilities	Develop the course materials, teach weekly 2-hour recitation sessions, host weekly office hours, help students design projects, supervise group projects, answer final exam questions, and grade assignments and exams.

MENTORING

2021 Fall - Now	Aishwarya Joshi, CMU ECE Undergraduate
2021 Fall - Now	Sophie Sacks, CMU ECE Undergraduate
2021 Summer - Now	Johnson Kuang, Summer REU from University of Washington Seattle
2020 Summer - Now	Gram Liu, CMU ECE Undergraduate
2020 Summer - Now	David Hwang, CMU ECE Undergraduate
2021 Spring - Now	Bill Guo, CMU HCII Undergraduate
2020 - 2021	Rituparna Roychoudhury, CMU Master Student, now Product Designer at Rex
2019 - 2020	Marc Dubin, CMU HCII Master Student, now at Microsoft
2018 Fall	Ruiqi Zhu, CMU Undergraduate, now Ph.D. student at Georgia Tech
2017 Summer	Minyi Liu, Visiting student from Tsinghua, now Master student at Tsinghua-UW
2017 Summer	Zhijian Yang, Visiting student from Tsinghua, now Ph.D. student at UIUC
2017 Spring	Vita Chen, CMU HCII Master Student, now at Houzz

SERVICE

Program Committees

IEEE S&P 2020	Shadow Program Committee Member
SIGCHI Late Breaking Work 2019/2020	Program Committee Member
CHINESE CHI 2018/2019/2020/2021	Program Committee Member
MobiCom S ³ Workshop 2018	Program Committee Member
SIGCSE 2018	Program Committee Member

Organization Chair

MobileHCI 2022	Student Design Competition Chair
Ubicomp & ISWC 2021	Virtual Platform and Web Co-Chair
ACM CHI 2019	'Designing the Things in IoT', Session Chair

External Reviewers (100+ papers)

ACM CHI Outstanding Reviews	17/18/22
ACM CHI	16/17/18/19/20/22
ACM UbiComp/IMWUT	17/18/19/20
ACM UIST	14/15/16/17/20/21
ACM CSCW	21
ACM DIS	16/17/18
ACM ICMI	16/17
IEEE VR	18
ACM MobileHCI	21
ACM EMSOFT	20
IEEE COMSNETS	19
International Journal of Human-Computer Studies	18/19
IEEE Transactions on Human-Machine Systems	18
Learning OpenCV 3 Computer Vision with Python	Book review. ISBN 978-1-78528-384-0

Misc

CMU HCII Summer REU Admission Committee	2021
CMU HCII Ph.D. Application Assistance Program	2020
CMU AI Undergraduate Mentoring	2020
CMU Summer Outreach classes for kids	2018
ACM CHI student volunteer	2016

REFERENCES

Jason I. Hong, Professor
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Human-Computer Interaction Institute
School of Computer Science
Carnegie Mellon University, Pittsburgh, PA, USA

Yuvraj Agarwal, Associate Professor
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Department of Electrical Engineering and Information Systems
The University of Tokyo, Tokyo, JAPAN