Cheng Zhang

CONTACT INFORMATION

231 Gates Hall
Cornell University
Gates Hall, Ithaca, NY

Phone: (607) 255-8441
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SciFi Lab: https://www.scifilab.org/
Personal Website: https://www.czhang.org/

RESEARCH INTERESTS

Ubiquitous Computing, Wearable Computing, Human Computer Interaction

EDUCATION

Georgia Institute of Technology, Atlanta, Georgia USA

Ph.D., Computer Science, Ubicomp Lab — August, 2012 - May, 2018

- Advisor: Dr. Gregory D. Abowd and Dr. Omer Inan
- Thesis Title : Novel Gestures for Wearables (**Georgia Tech College of Computing Doctoral Dissertation Award and Nominated for ACM Doctoral Dissertation Award**)
- Thesis Committee: Dr. Gregory Abowd , Dr. Omer Inan , Dr. Thad Starner, Dr. Thomas Ploetz, Dr.Chris Harrison

Institute of Software, Chinese Academy of Sciences, Beijing, China

M.S., Computer Applied Technology, **Outstanding Graduates 5%**(Highest Honor) September, 2009 - July, 2012

Nankai University, Tianjin, China

B.A., Software Engineering, — September, 2004 - June, 2008

PROFESSIONAL EXPERIENCE

Cornell University, Ithaca, New York USA

Assistant Professor in Information Science at Bowers College of Computing and Information Science
Director of Smart Computer Interfaces for Future Interaction (SciFi) Lab — July. 2018 - Present

Georgia Institute of Technology, Atlanta, Georgia USA

Graduate Research Assistant — August. 2012 - May. 2018

Yahoo! Labs, Sunnyvale, California, USA *Research Intern* — May, 2014 - July,2014
Distinguish drivers by using sensors from the smartphone and OBD sensor in the car.

IBM China, Beijing, China *Software Engineer Intern* — Dec, 2009 - Feb,2010

Institute of Software, Chinese Academy of Sciences, Beijing, China

Graduate Research Assistant — September, 2009 - July,2012
Researched on tangible programming interface and music interface for children.

SELECTED AWARDS

- Best Paper Honorable Mention on International Symposium on Wearable Computing (ISWC) 2023
- Ubicomp 10-Year Impact Award 2023
- NSF CAREER Award 2023
- ECCV Best Demo Honorable Mention 2020
- Georgia Tech College of Computing Doctoral Dissertation Award 2019

- Outstanding Graduate Research Assistant in College of Computing, Georgia Tech (Top award for graduate research assistants in the College) 2018
- Best Short Paper Award on 20th ACM Conference on Intelligent User Interfaces (less than 1% of all submissions) 2015
- Best Paper Award on Ubicomp 2013 (less than 1% of all submissions) 2013
- Outstanding Graduate in Beijing (Top 4% from all graduate students in Beijing) 2012
- Outstanding Graduate in the Graduate University of the Chinese Academy of Sciences (Highest Honor, Top 4% from all graduate students) 2012
- Merit Student at the Chinese Academy of Science (15%) 2011
- 3rd Prize, Outstanding Student Scholarship of Nankai University 2006
- 2nd Prize, Freshman Scholarship of Nankai University (5%) 2004
- 3rd Prize, Mathematical Olympiad Competition for Students at Middle School students in ShaanXi Province, China 2001
- 2nd Prize, Mathematical Olympiad Competition for Students at Elementary School Students in XianYang City, ShaanXi Province, China 1998

Teaching Experience

Cornell University, Ithaca, New York USA

Instructor

- "IS PhD Professionalization Seminar" [INFO 7905]. Fall 2020
- "Introduction to Rapid Prototyping and Physical Computing" [INFO 4320/5321]. Spring 2019, 2020, 2021, 2022, 2023,2024, Fall 2022,2023
- "Novel Interaction Techniques" [INFO 4275/6275]. Fall 2019
- "Information Science Special Topics: Future User Interfaces" [INFO 4940 INFO 6940]. Fall 2018

Georgia Institute of Technology, Atlanta, Georgia USA

Teaching Assistant

- Principles of User Interface Software,[CS 6456, CS 4470]. Fall, 2014
  Instructor: Dr. Keith Edwards

- "Mobile and Ubiquitous Computing" [CS 7470,CS 4605,ID 8900,ID 4823]. Spring, 2016
  Instructor: Dr. Thad Starner

Publications

Yin LI, Rohan Reddy, **Cheng Zhang**, Rajalakshmi Nandakumar Beyond-Voice: Towards Continuous 3D Hand Tracking on Commercial Home Assistant Devices. International Conference on Information Processing in Sensor Networks, (ISPN'24). **To Appear**

Ke Li, Ruidong Zhang, Siyuan Chen, Boao Chen, Francois Guimbretiere, **Cheng Zhang**. EyeEcho: Continuous and Low-power Facial Expression Tracking on Glasses. The Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI'24). **To Appear**

Chi-jung Lee, Ruidong Zhang, Devansh Agarwal, Tianhong Catherine Yu, Vipin Gunda, Oliver Lopez, James Kim, Sicheng Yin, Boao Dong, Ke Li, Mose Sakashita, Francois Guimbretiere, **Cheng Zhang**. EchoWrist: Continuous Hand Pose Tracking and Hand-Object Interaction Recognition Using Low-Power Active Acoustic Sensing On a Wristband. The Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI'24). **To Appear**

Ke Li, Ruidong Zhang, Boao Chen, Siyuan Chen, Sicheng Yin, Qikang Liang, Francois Guimbretiere, **Cheng Zhang**. GazeTrak: Exploring Acoustic-based Eye Tracking on a Glass Frame. 2024 International Conference on Mobile Computing and Networking (MobiCom '24). **To Appear**

Ruidong Zhang, Ke Li, **Cheng Zhang**. HPSpeech: Silent Speech Interface for Commodity Headphones . The 2023 international symposium on wearable computers (ISWC '23). **Highest Review Score, Best Paper Honorable Mention**

Ruijia Sun, Xiaohe Zhou, Benjamin Steeper, Ruidong Zhang, Sicheng Yin, Ke Li, Shengzhang Wu, Francois Guimbretiere, **Cheng Zhang**. EchoNose: Sensing Mouth, Breathing and Tongue Gestures inside Oral Cavity using a Non-contact Nose Interface. The 2023 international symposium on wearable computers (ISWC '23).

Hyunchul Lim, Guilin Hu, Richard Jin, Hao Chen, Ryan Mao, Ruidong Zhang, **Cheng Zhang**. C-Auth: Exploring the Feasibility of User Authentication on Smart Glasses Based on Subtle Skin-Deformations. The 2023 international symposium on wearable computers (ISWC '23).

Saif Mahmud, Ke Li, Guilin Hu, Hao Chen, Ricard Jin, Ruidong Zhang, Francois Guimbretiere, **Cheng Zhang**. PoseSonic: 3D Upper Body Pose Estimation Through Egocentric Acoustic Sensing on Smartglasses. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT/Ubicomp'23).

Ruidong Zhang, Ke Li, Yihong Hao, Yufan Wang, Zhengnan Lai, Francois Guimbretiere, **Cheng Zhang**. EchoSpeech: Continuous silent speech recognition on minimally-obtrusive eyewear powered by acoustic sensing. The Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23).

Mose Sakashita, Xiaoyi Li, Ruidong Zhang, Hyunju Kim, Michael Russo, Malte Jung, **Cheng Zhang**, Francois Guimbretiere, ReMotion: Supporting Remote Collaboration in Open Space with Automatic Robotic Embodiment. The Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, (CHI '23).

Hyunchul Lim, Samhita Pendyal, Wei Liu, Yaxuan Li, Ruidong Zhang, Jeyeon Jo, Benjamin Steeper,**Cheng Zhang**. D-Touch: Recognizing and Predicting Fine-grained Hand-face Touching Activities Using a Neck-mounted Wearable. The 28th Annual Conference on Intelligent User Interfaces (IUI '23).

Ruidong Zhang, Jihai Zhang, Nitish Gade, Peng Cao, Se Yun Kim, Junchi Yan, **Cheng Zhang**. EatingTrak: Detecting fine-grained eating moments in the wild using a wrist-mounted IMU. The ACM International Conference on Mobile Human-Computer Interaction. (MobileHCI '22).

Hyunchul Lim, Yaxuan Li, Matthew Dressa, Fang Hu, Jae Kim, Ruidong Zhang, **Cheng Zhang**. BodyTrak: Inferring Full-body Poses from Body Silhouettes using a Miniature Camera on a Wristband. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) /Ubicomp '22.

Ke Li, Ruidong Zhang, Bo Liang, Francois Guimbretiere, **Cheng Zhang**. EarIO: A Low-power Acoustic Sensing Earable for Continuously Tracking Detailed Facial Movements. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) /Ubicomp '22.

Ruidong Zhang, Mingyang Chen, Benjamin Steeper, Yaxuan Li, Zihan Yan, YiZhuo Chen, Songyun Tao, Tuochao Chen, Hyunchul Lim, **Cheng Zhang**. SpeeChin: A Smart Necklace for Silent Speech Recognition . The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) /Ubicomp '22.

Wei Sun, Franklin Mingzhe Li, Congshu Huang, Zhenyu Lei, Benjamin Steeper, Songyun Tao, Feng Tian, **Cheng Zhang**. ThumbTrak: Recognizing Micro-finger Poses Using a Ring with Prosimity

Sensing. The ACM International Conference on Mobile Human-Computer Interaction (MobileHCI'21).

Hyunchul Lim, David Lin, Jessica Tweneboah, **Cheng Zhang**. HandyTrak: Recognizing the Holding Hand on a Commodity Smartphone from Body Silhouette Images. The 33rd ACM Symposium on User Interface Software and Technology (UIST'21).

Tuochao Chen, Songyun Tao, Yaxuan Li, Hyunchul Lim, Mose Sakashita, Ruidong Zhang, Francois Guimbretiere, **Cheng Zhang**. NeckFace: Continuously Tracking Full Facial Expressions by Deep Learning the infrared images of the chin and face from Neck-mounted wearables. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) /Ubicomp '21.

Wei Sun, Franklin Mingzhe Li, Benjamin Steeper, Songlin Xu, Feng Tian, **Cheng Zhang**. TeethTap: Recognizing Discrete Teeth Gestures using Motion and Acoustic Sensing on an Earpiece. The 26th Annual Conference on Intelligent User Interfaces (IUI'21).

Tuochao Chen, Benjamin Steeper, Kinan Alsheikh, Songyun Tao, Francois Guimbretiere, **Cheng Zhang**. C-Face: Continuously Reconstructing Facial Expressions by Deep Learning Contours of the Face with Ear-mounted Miniature Cameras. The 33rd ACM Symposium on User Interface Software and Technology (UIST'20). [Project Page]

Wei Sun, Tuochao Chen, Jiayi Zheng, Zhenyu Lei, Lucy Wang, Benjamin Steeper, Peng He, Matthew Dressa, Feng Tian, **Cheng Zhang**. VibroSense: Recognizing Home Activities by Deep Learning Subtle Vibrations on an Interior Surface of a House from a Single Point Using Laser Doppler Vibrometry. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) /Ubicomp '20. [Project Page]

Fang Hu, Peng He, Songlin Xu, Yin Li, **Cheng Zhang**. FingerTrak: Continuous 3D Hand Pose Tracking by Deep Learning Hand Silhouettes Captured by Miniature Thermal Cameras on Wrist. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) /Ubicomp '20, [Project Page]

Hong Li, Shishir Chawala, Richard Li, Sumeet Jain, Gregory D. Abowd, Thad Starner, **Cheng Zhang**, Thomas Ploetz. WristWash: Towards Automatic Handwashing Assessment using a Wrist-worn Device. The 2018 international symposium on wearable computers (ISWC '18)

Cheng Zhang, Qiuyue Xue, Anandghan Waghmare, Ruichen Meng, Sumeet Jain, Yizeng Han, Xinyu Li, Kenneth Cunefare, Thomas Ploetz, Thad Starner, Omer Inan, Gregory D. Abowd. FingerPing: Recognizing fine-grained hand poses using active acoustic on-body sensing, (Was named FingerSonar) The Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18) [Paper][Video]

Cheng Zhang, Anandghan Waghmare, Pranav Kundra, Scott Gilliland, Thomas Ploetz, Thad Starner, Omer Inan, Gregory D. Abowd. FingerSound: Recognizing unistroke thumb gestures using a Ring, The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)/ Also presented at The ACM international joint conference on pervasive and ubiquitous computing (Ubicomp) 2017. [Paper][Video]

Bin Guo, Yi Ouyang, **Cheng Zhang**, Jiafan Zhang, Zhiwen Yu, Yu Wang, CrowdStory: Fine-Grained Event Storyline Generation by Fusion of Multi-Modal Crowdsourced Data. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)/Ubicomp 2017. [Paper]

Cheng Zhang, Xiaoxuan Wang, Anandghan Waghmare, Sumeet Jain, Thomas Ploetz, Omer Inan, Thad Starner, Gregory Abowd, FingOrbits: Interaction with Wearables using Synchronized Thumb Movements , The 2017 international symposium on wearable computers (ISWC 2017). [Paper][Video]

Cheng Zhang, Qiuyue Xue, Anandghan Waghmare, Sumeet Jain, Yiming Pu, Sinan Hersek, Kent Lyons, Kenneth A. Cunefare, Omer T. Inan, Gregory D. Abowd. 2017. SoundTrak: Continuous 3D Tracking of a Finger Using Active Acoustics. The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)/ Also presented at The ACM international joint conference on pervasive and ubiquitous computing (Ubicomp) 2017. [Paper][Video]

Caleb Southern, Yunnuo Cheng, **Cheng Zhang**, Gregory D. Abowd. 2017. Understanding the Cost of Driving Trips. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17). ACM, New York, NY, USA, 430-434. [Paper]

Cheng Zhang, Sinan Hersek, Yiming Pu, Danrui Sun, Qiuyue Xue, Thad E. Starner, Gregory D. Abowd, Omer T. Inan. Bioacoustics-Based Human-body-mediated communication (Published on February Issue 2017 on IEEE Computer Magazine) [Paper][Video]

Cheng Zhang, Abdelkareem Bedri, Gabriel Reyes, Bailey Bercik, Omer T. Inan, Thad E. Starner, Gregory D. Abowd. TapSkin: Recognizing on-skin input for smartwatches, Published on 2016 ACM International Conference on Interactive Surface and Spaces (ISS) 2016, Acceptance rate: 33/119 = 27.7% [Paper][Video]

Cheng Zhang, Junrui Yang, Caleb Southern, Thad E. Starner, Gregory D. Abowd. WatchOut: extending interactions on a smartwatch with inertial sensing, In Proceedings of the 2016 ACM International Symposium on Wearable Computers (ISWC), 2016, Acceptance rate: 18 papers were accepted as full paper out of 132 submissions [Paper][Video]

Cheng Zhang, Anhong Guo, Dingtian Zhang, Yang Li, Caleb Southern, Rosa Arriaga, Gregory D Abowd. Beyond the Touchscreen: An Exploration of Extending Interactions on Commodity Smartphones, In ACM Transactions on Interactive Intelligent Systems, 2016, Special Issue "Highlights of IUI'15) [Paper]

Cheng Zhang, Senaka Buthpitiya, Mitesh Patel, Kent Lyons, Beverly Harrison, Gregory D. Abowd, Driver Classification based on their behaviors (In Proceedings of the 20th International Conference on Intelligent User Interfaces (IUI) 2016), Acceptance rate 24%. [Paper]

Cheng Zhang, Anhong Guo, Dingtian Zhang, Caleb Southern, Rosa I.Arriaga, Gregory D Abowd. BeyondTouch:Extending the Input Language with Built-in Sensors on Commodity Smartphones, In Proceedings of the 20th International Conference on Intelligent User Interfaces (IUI) 2015, Acceptance rate 22.9% [Paper][Video]

Edison Thomaz, **Cheng Zhang**, Irfan Essa, Gregory Abowd, Inferring Meal Eating Activities in Real World Settings from Ambient Sounds: A Feasibility Study, In Proceedings of the 20th International Conference on Intelligent User Interfaces (IUI) 2015, **Best Short Paper 1%**, Acceptance rate 22.9%. [Paper]

Yoshihiro Kawahara, Steve Hodges, Benjamin S. Cook, **Cheng Zhang**. Gregory D Abowd. Instant Inkjet Circuits: Labbased Inkjet Printing to Support Rapid Prototyping of UbiComp Devices. The 2013 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2013). [Paper] **Best Paper Award, less than 1%**

Cheng Zhang, A Tangible Programming Tool for Children, Master in Computer Applied Technology Thesis, Institute of Software and Graduate University of Chinese Academy of Sciences, July,

2012.

Danli Wang, **Cheng Zhang** (*The only student author*), Hongan Wang. T-Maze: A Tangible Programming Tool for Children The 10th ACM International Conference on Interaction Design and Children (IDC) 2011, Acceptance Rates 30%. [Paper]

Poster & Doctoral School

Fang Hu, Peng He, Songlin Xu, Yin Li, **Cheng Zhang**. FingerTrak: Continuous 3D Hand Pose Tracking by Deep Learning Hand Silhouettes Captured by Miniature Thermal Cameras on Wrist. Demo for ECCV'20, **ECCV'20 Best Demo Honorable Mention**. [Project Page]

Ricardo Gonzalez Penuela, Paul Vermette, Zihan Yan, Cheng Zhang, Keith Vertanen, Shiri Azenkot, Proceedings of the 24th International ACM SIGACCESS Conference on Computers and Accessibility (Poster, ASSETS'23)

Fang Hu, Peng He, Songlin Xu, Yin Li, **Cheng Zhang**. FingerTrak: Continuous 3D Hand Pose Tracking by Deep Learning Hand Silhouettes Captured by Miniature Thermal Cameras on Wrist. Demo for ECCV'20, **ECCV'20 Best Demo Honorable Mention**. [Project Page]

Cheng Zhang, Aman Parnami, Caleb Southern, Edison Thomaz, Gabriel Reyes, Rosa Arriaga, Gregory Abowd BackTap: Robust Four-Point Tapping on the Back of an Off-the-shelf Smartphone, Video, Proceedings of the Adjunct Publication of the 26th Annual ACM Symposium on User Interface Software and Technology (UIST'13). [Paper][Video]

Cheng Zhang, Rosa I. Arriaga, Gregory D Abowd. BeyondTouch: A Framework for Extending Input on Commodity Smartphones. The Doctoral School of UbiComp 2013, Zurich, Switzerland, September 8-12, 2013. [Paper]

Cheng Zhang, Li Shen, Danli Wang, Feng Tian, Hongan Wang. "CoolMag: A Tangible Interaction Tool to Customize Instruments for Children in Music Education " the 13th ACM International Conference on Ubiquitous Computing (Ubicomp'11) (Poster). [Paper]

Selected Patents / Patent applications

Cheng Zhang, Ruidong Zhang, Benjamin Steeper Acoustic Interface System for Silent Recognition and Other Applications Appl No. 63/392,716

Cheng Zhang, Francois Guimbretiere, Ruidong Zhang, Ke Li Wearable Facial Movement Tracking devices Appl No. 63/343,023

Cheng Zhang, Ruidong Zhang, Se Yun Kim, Peng Cao, Xiayan Ji Machine learning based activity detection utilizing reconstructed 3D arm postures, Pat. App. PCT/US21/29189

Cheng Zhang, Tuochao Chen, Wei Sun, SYSTEMS, Software and Methods for recognizing home activities by deep learning subtle vibrations on an interior surface of a house from a signle point using vibration sensing devices. U.S. Pat. App. 63/075,746, Sep 8, 2020

Cheng Zhang, et al. FingerTrak: Deep Continuous 3D hand posture tracking, U.S. Provisional Patent Application No. 63/015,381 April 24, 2020;

Cheng Zhang, Tuochao Chen, Ben Steeper, C-Face: Continously Reconstructing facial expressions by deep learning contours of the face with Ear-mounted, U.S. Provisional Patent Application No. 63/025,979, May 15, 2020;

Cheng Zhang, Gregory D. Abowd, Omer Inan, Pranav Kundra, Thomas Ploetz, Yiming Pu, Thad Starner, Anandghan Waghmare, Xiaoxuan Wang, Kenneth Cunefare, Qiuyue Xue, "Systems, Meth-

ods and Devices for Gesture Recognition" U.S. Patent Application 16/644,651, International Application Number: PCT/US2018/049740, Canadian Patent Application No. 3,033,852

Cheng Zhang, Gregory D. Abowd, Omer Inan, Thad Starner, Electronic Device and Method of Controlling the Same , U.S. Issued Patent NO 11,389,084 ; European patent application 17841995.8, International Application No.: PCT/US17/46960 . Licensed to create a new Start-up at Montreal, Canada: ProximityHCI

Cheng Zhang, Gregory D Abowd, Junrui Yang, Extending Interactions of A Portable Electronic Device, United States Patent Application Publication , Pub No: US 2019/0204932 A1, Pub date Jul 4, 2019 , Issue Date, Jan. 2020. European Patent Application No. 17847362.5, International Application No.: PCT/US2017/049103 Licensed to create a new Start-up at at Montreal, Canada:ProximityHCI

Dangli Wang, **Cheng Zhang**(*The only student author*), Hongan Wang, Guozhong Dai, A tangible programming method and system. *Chinese Patent NO. 102136208A* Issued Date 2013

Dangli Wang, **Cheng Zhang** (*The only student author*), Hongan Wang, Guozhong Dai, A collaborative tangible programming method. *Chinese Patent NO. 102800223A* Issued Date 2014

Dangli Wang, Tianyuan Gu, **Cheng Zhang**, Hongan Wang, A tangible programming method and system using wireless communication. *Chinese Patent NO. 102789713A* Issued Date 2015

Awarded Grants

- "I-Corps: Active Acoustic Sensing for Wearables". NSF I-Corp: $50K Nov. 2023
- "CAREER: Towards sensing and understanding fine-grained body postures in daily life using intelligent wearables with acoustic sensing ". NSF CAREER Award: $667K Feb. 2023
- "Hands-free and eyes-free interaction for the next generation of smart glass empowered by intelligent low-power, minimally-obtrusive, and privacy-sensitive acoustic sensors". Cornell Ignite Innovation Acceleration : $50K 2022
- "Recognizing Fine-grained Hand-Face Touching Behaviors using Minimally-obtrusive Wearables with Magnetic Sensing". Cornell China Center-SJTU Seed Grant : $15K 2022
- "Towards automated eating activity recognition in the wild using a commodity smartwatch". Cornell China Center-SJTU Seed Grant : $14K 2020
- Georgia Tech Wearable Computing Center Engagement Grant $8K 2014

Selected Talks

- "Advancing Everyday Wearable Computing in the Wild: Intelligent Wireless Sensing on the Body", Bose Innovation Series Sep 2023
- "Tracking detailed body movements using AI-powered minimally-obtrusive wearables", Global Innovation Exchange Institute July 2022
- "Tracking detailed body movements using AI-powered minimally-obtrusive wearables", Facebook Reality Lab May 2021
- " Novel Gestures for Wearables", Google Sep 2017
- "Sensing + Interaction On and Around the Body", InfoSci Cornell University Mar 2018
- "Sensing + Interaction On and Around the Body", EECS University of Michigan Mar 2018
- "Sensing + Interaction On and Around the Body", EECS Peking University June 2018
- "Sensing + Interaction On and Around the Body", CS Nanjing University June 2018
- "Sensing + Interaction On and Around the Body", CAG Lab, Zhejiang University June 2018

- "Sensing + Interaction On and Around the Body", EECS, Shanghai Jiaotong University June 2018
- "Sensing + Interaction On and Around the Body", CS, Fudan University June 2018
- "Sensing + Interaction On and Around the Body", John Hopcroft Center, Shanghai Jiaotong University Oct 2018
- "Sensing + Interaction On and Around the Body", AI Seminar, Cornell University Oct 2018
- "Sensing + Interaction On and Around the Body", Robotics Seminar, Cornell University Nov 2018
- "Sensing + Interaction On and Around the Body", CS, Huazhong University of Science and Technology Jun 2019

SERVICES

- Steering Committee Chair for International Symposium on Wearable Computers (ISWC) Feb 2024 - Now
- Program Committee Chair for Ubicomp'24
- Program Committee Chair for the 2023 International Symposium on Wearable Computers (ISWC'23)
- Associate Editor for Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) 2019 - Present
- Program Committee Member for CHI'20, CHI'23, CHI'24
- Registration Chair for The ACM Symposium on User Interface Software and Technology 2022 and 2023 UIST'22, UIST'23
- Reviewers for The ACM CHI Conference on Human Factors in Computing Systems (CHI) 2013-21, ACM International Joint Conference on Pervasive and Ubiquitous Computing (Ubicomp) 2014-16, The International Symposium on Wearable Computers (ISWC) 2014-21, ACM Symposium on User Interface Software and Technology (UIST) 2016-21, MobileHCI 2016-17, Intelligent User Interface(IUI) 2015-16, ACM International Conference on Interactive Surfaces and Spaces (ISS) 2017, Designing Interactive Systems (DIS) 2017-19, Pervasive Health 2015,
- Journal Reviewer for International Journal of Human Computer Studies(IJHCS), TOCHI, IEEE Transaction of Mobile Computing, Pervasive and Mobile Computing, The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT),
- Student Volunteer Chair for Ubicomp 17/ISWC 17 2017
- Program Committee on MobileHCI'17 workshop on object recognition for input and mobile interaction 2017
- Student Volunteer on IUI'16 March, 2016
- Volunteer: Atlanta Maker Fair 2015,2016
- Volunteer coordinator: Chinese Symposium on Human Computer Interaction 2011 March, 2011
- Volunteer coordinator: Chinese Strategy Symposium on Human Computer Interaction 2011 January, 2011
- Volunteer: 2010 Visual Information Communication International Symposium September, 2010

PHD STUDENTS ADVISED, CHAIR OF THE COMMITTEE

Hyunchul Lim, InfoSci Ph.D. Student, Cornell, Passed A-exam Aug. 2019 - now

Ruidong Zhang, InfoSci Ph.D. Student (**admitted to Fall 20, remote in the first year 20-21 due to the pandemic**), Cornell, Passed A-exam Aug. 2020 - now

Ke Li, InfoSci Ph.D. Student (**admitted to Fall 20, deferred to Summer 2021 due to the pandemic**), Cornell, Aug. 2021 - now

Saif Muhmud, InfoSci Ph.D. Student, Cornell, Aug. 2022 - now

Catherine Yu, InfoSci Ph.D. Student, Cornell, May. 2023 - now

	Chi-Jung Lee, InfoSci Ph.D. Student, Cornell,	May. 2023 - now
	Tan Gemicioglu, InfoSci Ph.D. Student (Co-advised with Tanzeem Choudhury), Cornell,	Aug. 2023 - now
PhD Committee Member	Yin Li, InfoSci Ph.D. Student, Cornell	
	Pin-Sung Ku, InfoSci Ph.D. Student, Cornell	
	Ricardo Gonzalez, InfoSci Ph.D. Student, Cornell	
	Ruojin Cai, Computer Science PhD student, Cornell	
	Jatin Aurora, Information Science PhD Student, Cornell	
	Qianqian Wang, Computer Science PhD student, Cornell, Graduated in 2023	
	Matt Lee, InfoSci Ph.D. Student, Cornell. Graduated in 2023	
Undergrad and MS Students Advised	Vineet Parikh , MS in Computer Science,	Jan 2023- Now
	Tangwuyou Su, MPS in InfoSci,	Oct 2023- Now
	Kenny Liang, CS Undergrad,	May 2023- Now
	Ashwin Ajit, CS Undergrad,	May 2023- Now
	Oliver Lopez, CS Undergrad,	June 2023- Now
	Morris Mo, InfoSci Undergrad,	Oct 2023- Now
	Adeyinka Oyemade, InfoSci, Undergrad,	September 2023- Now
	Cassidy Cheesman, InfoSci Undergrad,	Oct 2023- Now
	James Kim, CS Undergrad,	September 2023- Now
	Anant Shyam, CS Undergrad,	September 2023- Now
	Afua Ansah, ECE Undergrad,	September 2023- Now
	Guilin Hu, CS Undergrad,	Jan 2022- Now
	James Chen, CS Undergrad,	Jan 2022- Now
	Hao Chen, InfoSci Undergrad,	Jan 2022- Now
	Vipin Gunda, CS Undergrad,	Nov 2022- Now
	Serena Yan Zhang, CS Undergrad	March 2022- Now
	Devansh Agarwal, CS M.Eng Student,	Aug 2022- May 2023

Shengzhang (Jerray) Wu, MPS Student, Aug 2022- May 2023

Margia Rounok, CS M.Eng Student, Jan 2022- May 2023

Richard Jin, CS Undergrad, Jan 2022- Dec 2023

Boao Dong, CS Undergrad, May 2022- Aug 2023

Sissel Sun, CS Undergrad, June 2022- May 2023

Claire Zhou, CS Undergrad, Oct 2022- Dec 2023

Grace Wang, CS Undergrad, Nov 2022- May 2023

Rochelle Barsz, ECE Undergrad, Jan 2023- May 2023

Joy Zhu, CS Undergrad, Aug 2022- Dec 2022

Lucy Wang, InfoSci Undergrad, Cornell, March. 2019 - May 2021

Jessica Tweneboah, ECE Undergrad, June 2020 - May 2021

Samhita Pendyal , Biometry and Stats , Undergrad July 2020 - May 2021

David Lin, CS Undergrad, Cornell, Jan. 2020 - May 2021

Austin Brown, InforSci Undergrad, Cornell, Jan. 2021 - May 2021

Michelle Li, CS Undergrad, Cornell, Jan. 2021 - May 2021

Rishitha Thambireddy, CS Undergrad, Rawlings Presidential Research Scholars, Cornell, Jan. 2020 - May 2021

Vy Nguyen, CS Undergrad, Cornell, Jan. 2021 - May 2021

Nitish Gade, Math'20, MPS Student , Cornell, Jan 2021 - Dec 2021

Benjamine Steeper, InfoSci'20, Currently enrolled in CS Master Program, Cornell, Jan. 2019 - Aug 2022

Yaxuan Li, Remote Intern, Master student in McGill University, May. 2020 - Jan 2022

Zihan Yan, Remote Intern, Junior in Zhejiang University, Oct. 2020 - May 2021

Nianyi Wang, CS MS student, Cornell, Aug. 2019 - May 2020

Mingyang Chen, Remote Intern, Senior in Shanghai Jiaotong University, June. 2020 - Nov 2020

Wei Liu, Remote Intern, Senior in Shanghai Jiaotong University, June. 2020 - Nov 2020

Clara Song , CS Undergrad, Cornell, Jan. 2020 - May 2020

Andrew Xu, CS Undergrad, Cornell, Jan. 2020 - Dec 2020

Chris Oh, CS Undergrad, Cornell, Jan. 2020 - Dec 2020

Tianlin Zhao, CS Undergrad, Cornell, July. 2020 - Dec 2020

Tuochao Chen, Visiting Student from Peking University Jan. 2020 - Dec. 2020

Nianyi Wang , CS MS, Cornell, Sep. 2019 - June 2020

Wei Sun , Visiting student from Institute of Software, Chinese Academy of Sciences , Nov. 2018 - Jan 2020

Se Yun Kim, CS Undergrad, Cornell, Jan. 2019 - June 2020

Songyun Tao, MPS, Cornell, Oct. 2019 - Dec 2020

Kinan Alsheikh , CS Undergrad, Cornell Oct 2019 - Dec 2020

Xiayan JI, Visiting Student from University of Pennsylvania May. 2019 - Sep 2019

Peng Cao, Visiting Student from Peking University Sep. 2019 - Dec. 2019

Zhenyu Lei, Visiting Student from Huazhong university of Science and Technology July. 2019 - Dec. 2020

Songlin Xu, Visiting Student from Chinese University of Science and Technology July. 2019 - Jan. 2020

Fang Hu, Visiting Student from Shanghai Jiaotong University July. 2019 - Feb. 2020

Peng He, Visiting Student from Hangzhou dianzi University Sep. 2019 - Feb. 2020

Tingyu Cheng, Mechanical Engineering Master Student, Syracuse University, Oct. 2018 - Jan 2019

Xueting Bao, ECE Master of Engineering student, Cornell, Sep. 2018 - May 2019

Qinya Zeng, ECE Master of Engineering student, Cornell, Sep. 2018 - May 2019

Ji Wu, ECE Master of Engineering student, Cornell, Sep. 2018 - May 2019

Jie Huang, ECE Master of Engineering student, Cornell, Sep. 2018 - May 2019

Zhonghao Zhan, MPS student, Cornell, Sept. 2018 - Jan 2019

Fanwen Ji, MPS student, Cornell, Aug. 2018 - Jan 2019

Ru Wang, Undergraduate Summer Intern from EECS, Shanghai Jiaotong University, July 2018 - Sep. 2018

Bailey Bercik, CS Undergraduate student , Georgia Tech, Spring 2016 - April 2018

Qiuyue Xue, CS-MS student, Georgia Tech September 2017 - April 2018

Yuhui Zhao, Undergrad in Mechanical Engineering, Georgia Tech Summer 2017 - April 2018

Xi Chen, Undergraduate Visiting Student, Peking University	October 2017 - Janurary 2018
Shaurye Aggarwal, CS Undergrad, Georgia Tech,	Summer 2017 - April 2018
Yaxiong Liu, CS MS, Georgia Tech,	July 2017 - Dec 2017
Ruichen Meng, MS-HCI, Georgia Tech,	Spring 2017 - April 2018
Yizeng Han, Visiting Undergraduate Student , Tsinghua University,	Summer 2017
Yiming Pu, MS-HCI , Georgia Tech,	May 2016- May 2017
Anandghan Waghmore, MS-HCI , Georgia Tech,	August 2016 - May 2017
Sumeet Jain, MS-HCI , Georgia Tech,	August 2016- May 2017
Xinyu Li, MS-HCI student, Georgia Tech	September 2016 - May 2017
Pranav Kundra, CS-MS , Georgia Tech,	August 2016- May 2017
Danrui Sun, MS-HCI student, Georgia Tech	Summer, 2016
Junrui Yang, Visiting undergraduate student from Peking University,	Dec. 2015 - Feb. 2016
Anhong Guo, MS-HCI, Georgia Tech,	2013-2014

Selected Media Coverage

- New Scientist Smart glasses use sonar to work out where you're looking Mar. 2024
- Engadget These sonar-equipped glasses could pave the way for better VR body tracking November. 2023
- Tech Explorist New sonar-equipped glasses use AI to interpret upper body poses in 3D November. 2023
- TechExplore Glasses use sonar, AI to interpret upper body poses in 3D November. 2023
- Hackster.IO Spec-tacular Body Pose Estimation November. 2023
- Cornell Chronicle Glasses use sonar, AI to interpret upper body poses in 3D November. 2023
- Fast Company These wild AI-powered glasses can read your own lips April. 2023
- Engadget Researchers built sonar glasses that track facial movements for silent communication April. 2023
- Popular Science These glasses can pick up whispered commands April. 2023
- Neuroscience News AI-Equipped Eyeglasses Read Silent Speech April. 2023
- Voice of America / Video Interview Fitness camera on the wrist and "electrified" atmosphere of the auto show in Los Angeles — "Details" Feb. 2023
- CNET Unique Wearable Tracker Can Detect the Whole Body in 3D Nov. 2022
- Hackster You Ain't Seen Nothin' Yet Nov. 2022
- Interesting Engineering First-of-its-kind wristband can track body's posture in 3D using a tiny camera Nov. 2022
- New ATLAS BodyTrak wrist camera constructs 3D models of the body in real time Nov. 2022
- Tech Xplore Wearable wristband captures entire body in 3D Nov. 2022
- Cornell Chronicle Wrist-mounted camera captures entire body in 3D Nov. 2022
- TechXplore https://techxplore.com/news/2022-07-wearable-device-sonar-reconstruct-facial.html July. 2022
- New ATLAS Wearable sonar tracks facial expressions using sound instead of cameras July. 2022
- Hackster You Sound Mad July. 2022
- Engadget Researchers made a sonar-equipped earphone that can capture facial expressions July. 2022

- Cornell Chronicle 'Earable' uses sonar to reconstruct facial expressions July. 2022
- Cornell Chronicle Smart necklace recognizes English, Mandarin commands Feb. 2022
- Gizmodo This Wearable Smart Camera Can Detect Voice Commands Without a Sound Feb. 2022
- New Atlas Speechin necklace recognizes its wearer's silently spoken words Feb. 2022
- TechXplore Smart necklace recognizes 'silent' English, Mandarin commands Feb. 2022
- Hackster SpeeChin Sits on Your Neck and Films Your Chin to Watch for Silent Speech Commands Feb. 2022
- Cornell Chronicle Smart necklace could track your detailed facial expressions Aug. 2021
- News Atlas Smart necklace monitors facial expressions to gauge your emotions Aug. 2021
- Hackster Face Your Emotions Aug. 2021
- MIT Technology Review China Earphone can detect facial expressions? Even with a face mask Nov. 2020
- NowThis Earphone cameras watch your facial expressions and read your lips Oct. 2020
- New Scientist Earphone cameras watch your facial expressions and read your lips Oct. 2020
- Yahoo News Cornell researchers created an earphone that can track facial expressions Oct. 2020
- Mashable Researchers created a way to track facial expressions with an earphone Oct. 2020
- Engadget Cornell researchers created an earphone that can track facial expressions Oct. 2020
- Vision System Design Miniature thermal camera system provides hand tracking Oct. 2020
- Cornell Chronicle Earphone tracks facial expressions, even with a face mask Oct. 2020
- MSN News Earphone wearables designed at Cornell convert facial expressions into emoji with nearly 90 per cent accuracy Oct. 2020
- New Atlas C-Face tech "sees" people's expressions, even through masks Oct. 2020
- South China Morning Post Earphone wearables designed at Cornell convert facial expressions into emoji with nearly 90 per cent accuracy Oct. 2020
- Science Daily Earphone tracks facial expressions, even with a face mask Oct. 2020
- TechXplore Earphone tracks facial expressions, even with a face mask Oct. 2020
- News Break Watch: Earbud device translates facial expressions into emojis Oct. 2020
- PhysicsWorld Machine learning and Doppler vibrometer monitor household appliances Sep 2020
- New Atlas VibroSense tracks home appliance usage via deep learning and lasers Sep 2020
- The Engineer Smart homes boost with VibroSense home appliance tracker Sep 2020
- Cornell Chronicle Device tracks house appliances through vibration, AI Sep 2020
- Yahoo Cornell's VibroSense makes appliances 'smart' by tracking their vibrations Sep 2020
- Engadget Cornell's VibroSense makes appliances 'smart' by tracking their vibrations Sep 2020
- News Break Cornell's VibroSense makes appliances 'smart' by tracking their vibrations Sep 2020
- Hackster.io Cornell Tracks Appliances, Home Activities Using a Single Laser-Based VibroSense Sensor Sep 2020
- Forbes Hand-Movement Sensing Bracelet Could Revolutionize Activity Tracking July 2020
- BBC 3D hand tracking wristband and other technology news July 2020
- Gizmodo Using Thermal Cameras to Track Hand Motions Could Be the Key to Interacting with Smart Glasses Jul 2020
- Cornell Chronicle Researchers develop 3D hand-sensing wristband July 2020
- Engadget Wrist-mounted wearable tracks your hand in 3D using thermal sensors Jul 2020
- VentureBeat Researchers show FingerTrak, a hand tracking wristband for AR/VR input Jul 2020
- News Break Researchers show FingerTrak, a hand tracking wristband for AR/VR input Jul 2020
- Science Daily 3D hand-sensing wristband signals future of wearable tech Jul 2020
- The Engineer FingerTrak wearable captures human hands in 3D Jul 2020
- MSN News Wrist-mounted wearable tracks your hand in 3D using thermal sensors Jul 2020
- Yahoo Wrist-mounted wearable tracks your hand in 3D using thermal sensors Jul 2020
- Hackster A Handy User Interface A wearable that continuously tracks hand pose, even in the

presence of obstructions. Jul 2020

- New Atlas Thermal camera bracelet reads your wrist to track your fingers Jul 2020
- NBC 15 WMTV New device developed at UW may help recognize early signs of Parkinson's or Alzheimer's Jul 2020
- TechXplore 3-D hand-sensing wristband signals future of wearable tech Jul 2020
- News Break Hand Tracking Wristband Brings More Detailed Hand Movements To VR & AR Jul 2020
- Georgia Tech News Center Wearable Computing Ring Allows Users to Write Words and Numbers with Thumb Nov 2017
- Science Daily Electronic Ring: Write With Thumb, See On Display Nov 2017
- MSN News In the palm of your hand: Wearable thumb tech to revolutionize how we text Nov 2017
- TechRadar This smart ring lets you write words and numbers with your thumb Nov 2017
- RT In the palm of your hand: Wearable thumb tech to revolutionize how we text Nov 2017
- Phys.org Wearable computing ring allows users to write words and numbers with thumb Nov 2017
- New Atlas Fingersound ring allows control of devices with thumb gestures Nov 2017
- Georgia Tech News Center & Georgia Tech Research Horizons New Techniques Allow Greater Control of Smartwatches Jan 2017
- Digital Trends Breathe in, breathe out: New technique controls smartwatch using breath and skin Jan 2017
- TechExplore New techniques allow greater control of smartwatches Jan 2017
- Tech2 New ways to interact with smartwatches to help user-device communication developed by researchers Jan 2017
- Yahoo News Breathe in, breathe out: New technique controls smartwatch using breath and skin Jan 2017
- TechRadar We may control the next generation of smartwatches by breathing on them Jan 2017
- Georgia Tech News Center Georgia Tech Develops Inkjet-Based Circuits at Fraction of Time and Cost Nov 2013
- ZDNet Instant inkjet circuits Oct 2013
- New Scientist Print a working paper computer on an $80 inkjet Oct 2013
- PHYS.ORG Georgia Tech develops inkjet-based circuits at fraction of time and cost Nov 2013
- Fast Company Hack Your Useless Inkjet To Print Electronics Circuits Nov 2013
- Science Daily Inkjet-based circuits created at fraction of time and cost Nov 2013
- HACKADAY Instant inkjet circuits with silver nanoparticle ink Dec 2013