XING-DONG YANG

School of Computing Science

Simon Fraser University

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My research in Human-Computer Interaction (HCI) is at the intersection of interactive smart "things", hardware learning and prototyping tools, and accessible computing. I create interactive systems using sensing techniques and haptics to enable powerful applications in smart physical and virtual environments and overcome societal challenges caused by poorly designed interfaces between humans and computers.

PROFESSIONAL AND RESEARCH POSITIONS

Simon Fraser University – School of Computing Science	2022 – present
Associate Professor	
Dartmouth College – Department of Computer Science	2022 – present
Adjunct Assistant Professor	
Dartmouth College – Department of Computer Science	2015-2021
Assistant Professor	
University of Calgary – Interactions Lab	2014
Postdoctoral Researcher. Advised by Anthony Tang and Saul Greenberg.	
Microsoft Research Asia – HCI Group	2012
Research Intern. Advised by Xiang Cao.	
Autodesk Research – User Interface Research Group	2010, 2012
Research Intern. Advised by Tovi Grossman and George Fitzmaurice.	

HONORS AND AWARDS

Awards

International Chinese Association of Computer-Human Interaction Outstanding Young Leader in HCI	2020
UIST'20 Best Paper Honorable Mention Award	2020
CHI'20 Best Paper Honorable Mention Award	2020
UIST'19 Best Paper Award	2019
CHI'19 Best Paper Honorable Mention Award $\times$ 2	2019
CHI'18 Best Paper Honorable Mention Award	2018
CHI'16 Best Paper Honorable Mention Award	2016
Bill Buxton Best Canadian HCI Dissertation Award	2013
Award of Excellence, Star of Tomorrow Internship Program, Microsoft Research Asia	2012
CHI'10 Best Paper Honorable Mention Award	2010
MobileHCI'09 Best Paper Honorable Mention Award	2009
Best Teaching Assistant Award	2009

Scholarships

Queen Elizabeth II Graduate Student Scholarship ($10,000 for 4 months)	2013
SurfNet Research Grant ($21,000)	2011
iCORE Graduate Student Scholarship in ICT ($15,000 per year).	2010 - 2012
Walter H Johns Graduate Fellowship ($4600 per year)	2010 - 2012
Natural Sciences and Engineering Research Council of Canada (NSERC) (PGS D3: $21,000 per year)	2009 - 2012
President's Doctoral Prize of Distinction ($10,000)	2009
Provost Doctoral Entrance Award ($4000)	2009
Provost Doctoral Entrance Award ($8000)	2008
University of Manitoba Student Union Scholarship for Academic Excellence ($3000)	2005

GRANTS

[G.7] NSERC Discovery Grant: Making Circuit Design and Prototyping Accessible for Blind or Low Vision People ($175,000) 2022 – 2027

[G.6] Adobe Research Gift. Supporting Virtual Semi-Extemporaneous Presentations ($17,000). 2011 – 2022

[G.5] NSF ABR: Collaborative research: Smart earpiece for supporting healthy eating behaviors ($976,098). With David Kotz, Jacob Sorber, Ryan Halter, Kofi M. Odame, and Kelly Caine. 2018 – 2020

[G.4] NSF CRII: SaTC: Lendable: Designing Modular Hardware and Unobtrusive Interactions to Enable Convenient and Trustworthy Lending of Small Personal Computing Devices. ($175,000). 2017 – 2020

[G.3] CompX Faculty Grants. One-Handed Text Entry on a Smartwatch using Wrist Gestures. ($21,000). 2017 – 2018

[G.2] NSF CSR: Large: Collaborative Research: Smart earpiece for supporting healthy eating behaviors ($1,082,976). With David Kotz, Jacob Sorber, Ryan Halter, Kofi M. Odame, and Kelly Caine. 2016 – 2018

[G.1] Microsoft HoloLens Academic Research Grant. Augmenting Reality for the Visually Impaired with Microsoft HoloLens ($100,000). With Emily Cooper and Wojciech Jarosz. 2016 – 2017

EDUCATION

Ph.D. in Computing Science 2008 - 2013
*Winner of 2013 Bill Buxton Best Canadian HCI Dissertation Award
Research area: Human-Computer Interaction
Thesis: Blurring the Boundary between Direct & Indirect Mixed Mode Input Environments
University of Alberta, Edmonton, Alberta, Canada

M.Sc. in Computing Science 2005 - 2008
Research area: Haptic User Interfaces
Thesis: A Performance Analysis of Motor-skill Training Using Haptic Training
University of Alberta, Edmonton, Alberta, Canada

B.Sc. in Computer Science (with Distinction) 2002 - 2005
University of Manitoba, Winnipeg, Manitoba, Canada

REFEREED PUBLICATIONS

A note on publication venues: in the field of Human-Computer Interaction, the ACM Conference on Human Factors in

Computing Systems (**CHI**) and ACM Symposium on User Interface Software &Technology (**UIST**) are considered top-tier forums for timely and impactful work, which have an annual acceptance rate of around 20 - 25%.

Underlined first authors: my advisees since I started my faculty position in July 2015.

Peer-Reviewed Conference Papers

[C.64] Z. Xu, Y. Meng, X. Bi, and **X.-D. Yang** (2022). Phrase-Gesture Typing on Smartphones. In *Proceedings of the ACM Symposium on User Interface Software &Technology (**UIST'22**).*

[C.63] T.-Y. Wu and **X.-D. Yang** (2022). iWood: Makeable Vibration Sensor for Interactive Plywood. In *Proceedings of the ACM Symposium on User Interface Software &Technology (**UIST'22**).*

[C.62] W. Sun, Y. Chen, Y. Chen, X. Zhang, S. Zhan, Y. Li, J. Wu, T. Han, H. Mi, J. Wang, F. Tian, **X.-D. Yang** (2022). MicroFluID: A Multi-Chip RFID Tag for Interaction Sensing Based on Microfluidic Switches. In *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**IMWUT'22**).* Volume 6, Issue 3.

[C.61] H. Ye, C.-J. Lee, T.-Y. Wu, **X.-D. Yang**, B.-Y. Chen, and R.-H. Liang (2022). Body-Centric NFC: Body-Centric Interaction with NFC Devices Through Near-Field Enabled Clothing. In *Proceedings of the ACM Conference on Designing Interactive Systems (**DIS'22**).* 1626-1639

[C.60] W. Sun, Y. Chen, S. Zhan, T. Han, F. Tian, H. Wang, and **X. D. Yang** (2021). RElectrode: A Reconfigurable Electrode For Multi-Purpose Sensing Based on Microfluidics. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'21**).*

[C.59] R. C. Chang, W. P. Wang, C. H. Chiang, T. Y. Wu, Z. Xu, J. Luo, B. Y. Chen, and **X. D. Yang** (2021). AccessibleCircuits: Adaptive Add-On Circuit Components for People with Blindness or Low Vision. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'21**).*

[C.58] T. Y. Wu, Z. Xu, **X. D. Yang**, S. Hodges, and T. Seyed (2021). Project Tasca: Enabling Touch and Contextual Interactions with a Pocket-based Textile Sensor. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'21**).*

[C.57] W. Cui, S. Zhu, Z. Li, Z. Xu, **X. D. Yang**, I. V. Ramakrishnan, and X. Bi (2021). BackSwipe: Back-of-device Word-Gesture Interaction on Smartphones. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'21**).*

[C.56] M. Yu, M. Zhang, C. Yu, X. Ma, **X. D.** Yang, and J. Zhang (2021). We Can Do More to Save Guqin: Design and Evaluate Interactive Systems to Make Guqin More Accessible to the General Public. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'21**).*

[C.55] T. Y. Wu, L. Tan, Y. Zhang, T. Seyed, and **X. D. Yang**. (2020). Capacitivo: Contact-Based Object Recognition on

Interactive Fabrics using Capacitive Sensing. In *Proceedings of the ACM Symposium on User Interface Software &Technology (**UIST'20**)*, 649–661.

[C.54] N. Li, H. J. Kim, L. Shen, F. Tian, T. Han, **X. D. Yang**, and T. J. Nam. (2020). HapLinkage: Prototyping Haptic Proxies for Virtual Hand Tools Using Linkage Mechanism. In *Proceedings of the ACM Symposium on User Interface Software &Technology (**UIST'20**)*, 1261–1274. **UIST 2020 Honorable Mention Award (Top 5%)**

[C.53] A. Panotopoulou, X. Zhang, T. Qiu, **X. D. Yang**, and E. Whiting. (2020). Tactile Line Drawings for Improved Shape Understanding in Blind and Visually Impaired Users. In *ACM Transactions on Graphics* (**SIGGRAPH'20**), Paper No. 89.

[C.52] J. Davis, T.-Y. Wu, B. Shi, H. Lu, A. Panotopoulou, E. Whiting, and **X. D. Yang**. (2020). TangibleCircuits: An Interactive 3D Printed Circuit Education Tool for People with Visual Impairments. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'20**)*. **CHI 2020 Honorable Mention Award (Top 5%)**

[C.51] Z. Xu, T. Y. Wu, J. Gong, D. Zhao, W. Chen, J. Luo, S. Yin, J. Zhai, and **X. D. Yang**. (2020). BiTipText: Bimanual Eyes-Free Text Entry on a Fingertip Keyboard. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'20**)*.

[C.50] T. Y. Wu, J. Gong, S. Qi, J. Chen, M. Shang, T. Seyed, and **X. D. Yang**. (2020). Fabriccio: Mid-Air Gestural Input on Interactive Fabrics. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'20**)*.

[C.49] P. S. Ku, J. Gong, T. Y. Wu, S. Zhang, Z. Zhu, B. Ens, and **X. D. Yang**. (2020). Zippro: The Design and Implementation of An Interactive Zipper. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'20**)*.

[C.48] P. S. Ku, Q. Shao, T. Y. Wu, J. Gong, Z. Zhu, X. Zhou, and **X. D. Yang**. (2020). ThreadSense: Locating Touch on an Extremely Thin Interactive Thread. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'20**)*.

[C.47] P. C. Wong, K. Zhu, **X. D. Yang**, and H. Fu. (2020). Exploring Eyes-free Bezel-initiated Gestures on Round Smartwatches. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'20**)*.

[C.46] T. Y. Wu, J. Gong, T. Seyed, and **X. D. Yang**. (2019). Proxino: Enabling Prototyping of Virtual Circuits with Physical Proxies. In *Proceedings of the ACM Symposium on User Interface Software &Technology (**UIST'19**)*, 121-132.

[C.45] J. Gong, Y. Wu, L. Yan, T. Seyed, and **X. D. Yang**. (2019). Tessutivo: Contextual Interactions on Interactive Fabrics with Inductive Sensing. In *Proceedings of the ACM Symposium on User Interface Software &Technology (**UIST'19**)*, 29-41.

[C.44] Z. Xu*, P. C. Wong*, J. Gong, T. Y. Wu, A. Nittala, X. Bi, J. Steimle, H. Fu, K. Zhu, and **X. D. Yang** (*co-primary).

(2019). TipText: Eyes-Free Text Entry on a Fingertip Keyboard. In *Proceedings of the ACM Symposium on User Interface Software &Technology (UIST'19)*, 883-899. **UIST 2019 Best Paper Award (Top 1%)**

[C.43] J. Davis*, J. Gong*, Y. Sun, P. Chilana, and **X. D. Yang** (*co-primary). (2019). CircuitStyle: A System for Peripherally Reinforcing Best Practices in Hardware Computing. In *Proceedings of the ACM Symposium on User Interface Software &Technology (UIST'19)*, 109-120.

[C.42] S. Je, M. J. Kim, W. Lee, B. Lee, **X. D. Yang**, P. Lopes, and A. Bianchi. (2019). Aero-plane: a Handheld Force-Feedback Device that Renders Weight Motion Illusion on a Virtual 2D Plane. In *Proceedings of the ACM Symposium on User Interface Software &Technology (UIST'19)*, 763-775.

[C.41] S. Y. Teng, D. Y. Huang, C. Wang, J. Gong, T. Seyed, **X. D. Yang**, and B. Y. Chen. (2019). Aarnio: Passive Kinesthetic Force Output for Foreground Interactions on an Interactive Chair. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'19)*, Paper No. 672.

[C.40] J. Y. Lo, D. Y. Huang, T. S. Kuo, C. K. Sun, J. Gong, T. Seyed, **X. D. Yang**, and B. Y. Chen. (2019). AutoFritz: Autocomplete for Prototyping Virtual Breadboard Circuits. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'19)*, Paper No. 403. **CHI 2019 Honorable Mention Award (Top 5%)**

[C.39] R. Wang, C. Yu, **X. D. Yang**, W. He, and Y. Shi. (2019) EarTouch: Facilitating Smartphone Use for Visually Impaired People in Public and Mobile Scenarios. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'19)*, Paper No. 24. **CHI 2019 Honorable Mention Award (Top 5%)**

[C.38] J. Gong, X. Yang, T. Seyed, J. Davis, and **X. D. Yang**. (2018). Indutivo: Contact-Based, Object-Driven Interactions with Inductive Sensing. In *Proceedings of the ACM Symposium on User Interface Software & Technology (UIST'18)*, 321-333.

[C.37] D. Y. Huang, T. Seyed, L. Li, J. Gong, Z. Yao, Y. Jiao, X. Chen, and **X. D. Yang**. (2018). Orecchio: Extending Body-Language through Actuated Static and Dynamic Auricular Postures. In *Proceedings of the ACM Symposium on User Interface Software & Technology (UIST'18)*, 697-710.

[C.36] Y. Li, T. Li, R. A. Patel, **X. D. Yang**, and X. Zhou. (2018). Self-Powered Gesture Recognition with Ambient Light. In *Proceedings of the ACM Symposium on User Interface Software & Technology (UIST'18)*, 595-608.

[C.35] G. Xia, C. Jacobsen, R. Dannenberg, Q. Chen, and **X. D. Yang**. (2018). ShIFT: A Semi-haptic Interface for Flute Tutoring. In *Proceedings of the international conference on new interfaces for musical expression (NIME'18)*, 162–167.

[C.34] J. Gong, D. Y. Huang, T. Seyed, T. Lin, T. Hou, X. Liu, M. Yang, B. Yang, Y. Zhang, and **X. D. Yang**. (2018). Jetto: Using Lateral Force Feedback for Smartwatch Interactions. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'18)*, Paper No. 426.

[C.33] J. Gong, Z. Xu, Q. Guo, T. Seyed, X. Chen, X. Bi, and **X. D. Yang**. (2018). WrisText: One-handed Text Entry on Smartwatch using Wrist Gestures. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'18)*, Paper No. 181. **CHI 2018 Honorable Mention Award (Top 5%)**

[C.32] S. Je, M. Lee, Y. Kim, L. Chan, **X. D. Yang**, and B. Andrea. (2018). PokeRing: Notifications by Poking Around the Finger. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI'18)*, Paper No. 542.

[C.31] D.Y. Huang, R. Guo, J. Gong, J. Wang, J. Graham, D. N. Yang, and **X. D. Yang**. (2017). RetroShape: Leveraging Rear-Surface Shape Displays for 2.5D Interaction on Smartwatches. In *Proceedings of the ACM Symposium on User Interface Software & Technology (UIST'17)*, 539-551.

[C.30] T. Han, Q. Han, M. Annett, F. Anderson, D. Y. Huang, and **X. D. Yang**. (2017). Frictio: Passive Kinesthetic Force Feedback for Smart Ring Output. In *Proceedings of the ACM Symposium on User Interface Software & Technology (UIST'17)*, 131-142.

[C.29] J. Gong, Y. Zhang, X. Zhou, and **X. D. Yang**. (2017). Pyro: Thumb-Tip Gesture Recognition Using Pyroelectric Infrared Sensing. In *Proceedings of the ACM Symposium on User Interface Software & Technology (UIST'17)*, 553-563.

[C.28] T. Seyed, **X. D. Yang**, and Daniel Vogel. (2017). A Modular Smartphone for Lending. In *Proceedings of the ACM Symposium on User Interface Software & Technology (UIST'17)*, 205-215. **UIST 2017 Best Talk Award**

[C.27] T. Li, X. Xiong, Y. Xie, G. Hito, **X. D. Yang**, and X. Zhou. (2017). Reconstructing Hand Gestures Using Visible Light. In *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT'17), Volume 1 Issue 3*.

[C.26] J. Gong, L. Li, D. Vogel, and **X. D. Yang** (2017). Cito: An Actuated Smartwatch for Extended Interactions. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI'17)*, 5331-5345.

[C.25] J. Gong, **X. D. Yang**, and P. Irani (2016). WristWhirl: One-handed Continuous Smartwatch Input using Wrist Gestures. In *Proceedings of the ACM Symposium on User Interface Software & Technology (UIST'16)*, 861-872.

[C.24] E. Chan, T. Seyed, W. Stuerzlinger, **X. D. Yang**, and F. Maurer (2016). User Elicitation on Single-hand Microgestures. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI'16)*, 3403-3414. **CHI 2016 Honorable Mention Award (Top 5%)**

[C.23] T. Seyed, **X. D. Yang**, and D. Vogel (2016). Doppio: A Reconfigurable Dual-Face Smartwatch for Tangible Interaction. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI'16)*, 4675-4686.

[C.22] T. Han, D. Ahlström, **X. D. Yang**, A. Byagowi, and P. Irani (2016). Exploring Design Factors for Transforming Passive Vibration Signals into Smartwear Interactions. In *Proceedings of NordiCHI'16*, Article No. 35.

[C.21] M. Serrano, B. Ens, **X. D. Yang**, and P. Irani (2015). Gluey: Developing a Head-Worn Display Interface to Unify the Interaction Experience in Distributed Display Environments. In *Proceedings of the ACM International Conference on Human-Computer Interaction with Mobile Devices and Services (**MobileHCI'15**),* 161 - 171.

[C.20] T. Seyed, **X. D. Yang**, A. Tang, S. Greenberg, J. Gu, B. Zhu, and X. Cao (2015). CipherCard: Enhancing Security on Common Touchscreen Devices using Two-factor Authentication. In *Proceedings of the IFIP Conference on Human-Computer interaction (**INTERACT'15**),* 436 - 454.

[C.19] A. Nittala, **X. D. Yang**, S. Bateman, E. Sharlin, and S. Greenberg (2015). PhoneEar: Interactions for Mobile Devices that Hear High-Frequency Sound-Encoded Data. In *Proceedings of the ACM SIGCHI Symposium on Engineering Interactive Computing Systems (**EICS'15**)*, 174-179.

[C.18] R. Tang, **X. D Yang**, S. Bateman, J. Jorge, and A. Tang. (2015). Physio@Home: Exploring visual guidance and feedback techniques for physiotherapy patients at home. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'15**)*, 4123-4132.

[C.17] **X. D. Yang**, K. Hasan, N. Bruce, and P. Irani (2013). Surround-See: Enabling Peripheral Vision on Smartphones during Active Use. In *Proceedings of the ACM Symposium on User Interface Software & Technology (**UIST'13**),* 291-300.

[C.16] M. Nancel, O. Chapuis, W. Pietriga, **X. D. Yang**, P. Irani, and M. Beaudouin-Lafon (2013). High-Precision Pointing on Large Wall Displays using Small Handheld Devices. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'13**),* 831-840.

[C.15] **X. D. Yang**, T. Grossman, D. Wigdor, and G. Fitzmaurice. (2012). Magic Finger: Always-Available Input through Finger Instrumentation. In *Proceedings of the ACM Symposium on User Interface Software & Technology (**UIST'12**),* 147-156.

[C.14] H. Zhang, **X. D. Yang**, B. Ens, H. N. Liang, P. Boulanger, and P. Irani (2012). See Me, See You: A Lightweight Method for Discriminating User Touches on Tabletop Displays. In *Proceedings of the ACM Conference on Human Factors in Computing Systems* (**CHI'12**), 2327-2336.

[C.13] K. Hasan, **X. D. Yang**, A. Bunt, and P. Irani (2012). A-Coord Input: Coordinating Auxiliary Input Streams for Augmenting Contextual Pen-Based Interactions. In *Proceedings of the ACM Conference on Human Factors in Computing Systems* (**CHI'12**), 805-814.

[C.12] K. Hasan, **X. D. Yang**, H. N. Liang, and P. Irani. (2012). How to Position the Cursor?: An Exploration of Absolute and Relative Cursor Positioning for Back-of-Device Input. In *Proceedings of the 13th International Conference on Human-Computer Interaction with Mobile Devices and Services (**MobileHCI'12**)*, 103-112.

[C.11] H. Tu, **X. D. Yang**, F. Wang, F. Tian, and X. Ren. (2012). Mode Switching Techniques through Pen and Device

Profiles. In *Proceedings of the 10th Asia Pacific Conference on Computer-Human Interaction (**APCHI'12**)*, 169-176.

[C.10] **X. D. Yang**, T. Grossman, P. Irani, and G. Fitzmaurice. (2011). TouchCuts and TouchZoom: Enhanced Target Selection for Touch Displays using Finger Proximity Sensing. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'11**)*, 2585-2594.

[C.9] C. Williams, **X. D. Yang**, G. Partridge, J. Usiskin-Miller, A. Major, P. Irani. (2011). TZee: Exploiting the Lighting Properties of Multi-touch Tabletops for Tangible 3D Interactions. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'11**)*, 1363-1372.

[C.8] **X. D. Yang**, E. Mak, D. McCallum, P. Irani, X. Cao, and S. Izadi (2010). LensMouse: Augmenting the mouse with an interactive touch display. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (**CHI'10**),* 2431-2440. **CHI 2010 Honorable Mention Award (Top 5%)**

[C.7] **X. D. Yang**, E. Mak, P. Irani, and W. F. Bischof (2009). Dual-Surface Input: Augmenting One-Handed Interaction with Coordinated Front and Behind-the-Screen Input. In *Proceedings of the ACM International Conference on Human-Computer Interaction with Mobile Devices and Services (**MobileHCI'09**)*, 10 pages, Article No.5. **MobileHCI 2009 Honorable Mention Award (Top 5%)**

[C.6] **X. D. Yang**, P. Irain, P. Boulanger, and W. F. Bischof (2009). A Model for Steering with Haptic-Force Guidance. In *Proceedings of the IFIP Conference on Human-Computer interaction (**INTERACT'09**)*, 465–478.

[C.5] **X. D. Yang**, W. F. Bischof, and P. Boulanger (2008). The Effects of Hand Motion on Haptic Perception of Force Direction. In *Proceedings of the Euro-haptics (**EH'08**),* 355–360.

[C.4] **X. D. Yang**, W. F. Bischof, and P. Boulanger (2008). Perception of Haptic Force Magnitude during Hand Movements. In *Proceedings of the IEEE International Conference on Robotics and Automation (**ICRA'08**)*, 129–135.

[C.3] **X. D. Yang**, W. F. Bischof, and P. Boulanger (2008). Validating the Performance of Haptic Motor Skill Training. In *Proceedings of the Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems (**HAPTICS'08**)*, 129–135.

[C.2] P. Irani, C. Gutwin, and **X. D. Yang** (2006). Improving the Selection of Off-Screen Targets with Hopping. In *Proceedings of the ACM SIGCHI Conference on Human Factors in computing systems (**CHI'06**)*, 299–308.

[C.1] I. Cheng, R. Shen, **X. D. Yang** and Pierre Boulanger (2006). Perceptual Analysis of Level-of-Detail: The JND Approach. In *Proceedings of the IEEE International Symposium on Multimedia (**ISM'06**)*, 533–540.

Journal Articles
[J.3] Huawei Tu, Weiyang Huan, Xing-Dong Yang, Xiangshi Ren & Feng Tian (2021). ArmMenu: command input on

distant displays with proprioception based lateral arm movements. Behav. Inf. Technol. 40(13): 1428-1447, 2021.

[J.2] J. Huang, M. Kinateder, M. J. Dunn, W. Jarosz, **X. D. Yang**, and E. Cooper. (2019). An augmented reality sign-reading assistant for users with reduced vision. *PLOS ONE*, 14(1):1–9, 2019

[J.1] M. Kinateder, J. Gualtieri, M. Dunn, W. Jarosz, **X. D. Yang**, and E. Cooper. (2018). Using an Augmented Reality Device as a Distance-based Vision Aid — Promise and Limitations. Optometry and Vision Science, 2018.

Workshop Papers & Posters

[W.7] M. Serrano, K. Hasan, B. Ens, **X. D. Yang**, and P. Irani (2015). Smartwatches + Head-Worn Displays: the 'New' Smartphone. In *Workshop on Mobile Collocated Interactions: From Smartphones to Wearables (**CHI'15**).*

[W.6] M. Serrano, B. Ens, **X. D. Yang**, and P. Irani (2015). Desktop-Gluey: Augmenting Desktop Environments with Wearable Devices. In *ACM MobileHCI 2015 Workshop on Mobile Collocated Interactions With Wearables (**MobileHCI'15**).*

[W.5] K. Zarei-nia, **X. D. Yang**, P. Irani, N. Sepehri (2009). Evaluating Factors that Influence Path Tracing with Passive Haptic Guidance. In *Proceedings of the International Workshop on Haptic and Audio Interaction Design (**HAID'09**)*, 21–30.

[W.4] **X. D. Yang**, P. Irani, P. Boulanger, and W. F. Bischof (2009). One-Handed Behind-the-Display Cursor Input on Mobile Devices. In *Proceedings of the ACM Conference Extended Abstracts on Human Factors in Computing Systems (**CHI EA'09**)*, 4501–4506.

[W.3] N. Kadaba, **X. D. Yang**, and P. Irani (2009). Facilitating Multiple Target Tracking using Semantic Depth of Field (SDOF). In *Proceedings of the ACM Conference Extended Abstracts on Human Factors in Computing Systems (**CHI EA'09**)*, 4375–4380.

[W.2] **X. D. Yang** and I. Cheng (2006), 3D Skeletonization Using an Enhanced Voxel Tree. In *Proceedings of the ACM SIGGRAPH research poster and abstract*.

[W.1] P. Boulanger, G. Wu, W. F. Bischof, and **X. D. Yang** (2006). Hapto-Audio-Visual Environments for Collaborative Training of Ophthalmic Surgery over Optical Network. In *Proceedings of the IEEE International Workshop on Haptic Audio-Visual Environments and their Applications (**HAVE'06**)*, 21–26.

PROFESSIONAL SERVICES

Program Committee:

ACM Conference on Human Factors in Computing Systems (CHI)	2018 – 2020, 2022-2023
ACM Symposium on User Interface Software & Technology (UIST)	2020 – 2022
ACM Interactive Surfaces and Spaces (ISS)	2020 – 2021

Graphics Interface (GI)	2015 - 2017
ACM Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI)	2014, 2016

Conference Organization

Data Chair (UIST)	2022
Doctoral Consortium Chair (MobileHCI)	2021
Tutorial Chair (MobileHCI)	2019
Program Chair (Chinese CHI)	2018 - 2019
Proceedings Chair (UIST)	2016 - 2017
Session Chair. Inking, Perception and Adaptation at Graphics Interface (GI)	2014

Conference Reviewer:

ACM SIGGRAPH	2020
ACM Conference on Human Factors in Computing Systems (CHI)	2010 – 2017, 2021
ACM Symposium on User Interface Software & Technology (UIST)	2012 – 2018
ACM Conference on Designing Interactive Systems (DIS)	2014 - 2018
ACM Conference on Tangible, Embedded and Embodied Interaction (TEI)	2013 - 2017
ACM Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI)	2012, 2013, 2015, 2017
SIGGRAPH Asia Emerging Technologies	2016
ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS)	2015
IACR Conference on Financial Cryptography and Data Security (FC)	2015
Graphics Interface (GI)	2009 - 2010, 2014
Asia Pacific Conference on Computer-Human Interaction (APCHI)	2012
ACM Conference on Interactive Tabletops and Surfaces (ITS)	2011- 2012
IEEE Symposium on 3D User Interfaces (3DUI)	2010, 2012, 2016
IEEE Information Visualization Conference (InfoVis)	2011
IEEE Conference on Intelligent Robots and Systems (IROS)	2010

Journal Editor and Reviewer:

International Journal of Human-Computer Studies – Associate Editor	2017 - present
Human-Computer Interaction	2017
International Journal on Computers & Graphics	2013, 2015
International Journal of Human-Computer Studies	2013
Transactions on Haptics	2010

Grant Reviewer:

Natural Sciences and Engineering Research Council of Canada Discovery Grants	2017
NSF Small Business Innovation Research	2016

STUDENTS AND POST-DOCS

Post-Docs

Guangyu (Gus) Xia (Ph.D., CMU) With Michael Casey.	2016 – 2017
Now: Assistant Professor at NYU Shanghai	
Da-Yuan Huang (Ph.D., National Taiwan University)	2016 – 2017

Now: Research Scientist at Huawei

Ph.D. Students

| **Te-Yen Wu (Ph.D., Dartmouth College)** | 2018 - present |

Thesis: Human-Material Interaction

Led to paper publications at UIST 2019, UIST 2020, and CHI 2019, 2020, 2021.

Research internship at Microsoft Research × 2, and Facebook Reality Labs

| **Zheer Xu (Ph.D., Dartmouth College)** | 2018 - present |

Thesis: AI-Driven Text Input

Led to paper publications at UIST 2019, CHI 2020, CHI 2021.

Research internship at Microsoft Research, Facebook Reality Labs, and Google Research

| **Josh Davis (Ph.D., Dartmouth College)** | 2018 - present |

Thesis: Creativity for All

Led to paper publications at UIST 2019 and CHI 2020.

Research internship at Autodesk Research, Microsoft Research, and Adobe Research

| **Jun Gong (Ph.D., Dartmouth College)** | 2015 - 2020 |

Now: Senior Research Scientist at Apple

Thesis: Enriching Input Modalities for Computing Devices Using Wrist-Worn Sensors.

Led to paper publications at UIST 2016, 2017, 2018, 2019, and CHI 2017, 2018, 2019, 2020.

Research internships at Autodesk Research, Facebook Reality Labs, and Apple Research.

| **Teddy Seyed (visiting Ph.D. student, University of Calgary)** | 2015 - 2019 |

Now: Senior Researcher at Microsoft Research Redmond

Led to paper publications at INTERACT 2015, CHI 2016, 2018, 2019, and UIST 2017, 2018, 2019.

| **Teng Han (visiting Ph.D. student, University of Manitoba)** | 2017 |

Now: Associate Professor at the Chinese Academy of Sciences

Winter 2017 project. Explored novel haptic feedback on smart rings.

Led to paper publication at UIST 2017

Masters Students

| **Yonghao Shi (M.Sc., Simon Fraser University)** | 2022 - 2024 |

Thesis: TBD

| **Lingxi Wu (M.Sc., Simon Fraser University)** | 2022 - 2024 |

Thesis: TBD

| **Yuntao Pen (M.Sc., Simon Fraser University)** | 2022 - 2024 |

Thesis: TBD

| **Ruijiao Luo (M.Sc., Simon Fraser University)** | 2022 - 2024 |

Thesis: TBD

| **Ruei-Che Chang (M.Sc., Dartmouth College)** | 2019 - 2021 |

Now: Ph.D. student at Michigan

Thesis: An Accessible Circuit Prototyping Environment for People Who are Blind or Visually Impaired

| **Ruizhen Guo (M.Sc., Dartmouth College)** | 2016 - 2017 |

Now: SE at Microsoft.

Thesis: Leveraging Rear-Surface Shape Displays for 2.5D Interaction on Smartwatches.

Led to paper publication at UIST 2017

Linjun Li (M.Sc., Dartmouth College) 2016 - 2017

Now: SE at Amazon

Thesis: Extending Body-Language through Actuated Static and Dynamic Auricular Postures.

Led to paper publication at UIST 2018.

Qianwen Chen (M.Sc., Dartmouth College) 2016 - 2017

Now: Interaction Designer at Google

Thesis: A Semi-haptic Interface for Flute Tutoring.

Led to paper publication at NIME 2018.

Ruchir A. Patel (M.Sc., Dartmouth College) 2016, 2018

Now: SE at Wing

Winter 2016 project. Novel Haptic Feedback for Smart Rings.

Winter 2018 project. Self-Powered Gesture Recognition with Ambient Light.

Led to paper publication at UIST 2018

Aditya Shekhar Nittala (M.Sc., University of Calgary) 2014

Now: Assistant Professor at Calgary

Summer 2014 project. Explored a technique for broadcasting data to smartphones via audio streams.

Led to paper publication at EICS 2015.

Richard Tang (M.Sc., University of Calgary) 2014

Now: SE at IBM Canada

M.Sc. thesis, with Anthony Tang. Explored visual guidance and feedback techniques for physiotherapy exercises.

Led to paper publication at CHI 2015.

Khalad Hasan (M.Sc., University of Manitoba) 2010 - 2012

Now: Assistant Professor of Computer Science at the University of British Columbia (Okanagan)

Summer 2011 project, with Pourang Irani. Explored the design space of multi-channel pen input.

Winter 2011 project, with Pourang Irani. Explored absolute and relative cursor positioning for back-of-device input.

Led to paper publication at CHI 2012 and MobileHCI 2012.

Cary Williams (M.Sc., University of Manitoba) 2011

Summer 2011 project, with Pourang Irani. Explored tangible interface on diffuse illumination (DI) tabletops.

Led to paper publication at CHI 2012.

Thesis Committees

Shuo Jiang (Ph.D. in Mechanical Engineering, Shanghai Jiao Tong University) 2020

Athina Panotopoulou (Ph.D. in Computer Science, Dartmouth College) 2020

Tianxing Li (Ph.D. in Computer Science, Dartmouth College) 2020

Qiuyu Lu (Ph.D. in Design, Tsinghua University) 2020

Teddy Seyed (Ph.D. in Computer Science, University of Calgary) 2019

Suwen Zhu (Ph.D. in Computer Science, Stony Brook University) 2019

TEACHING EXPERIENCE

Simon Fraser University - School of Computing Science   2022- present
Mobile Application Development and Introduction to HCI

Dartmouth College - Computer Science Department   2016- 2021
Introduction to HCI, Research Topics in HCI, and Smartphone Programming

University of Calgary - Computer Science Department   2014
Sessional Instructor (winter).
Instructor for Introduction to Computer Science for Computer Science Majors I.

University of Alberta - Computing Science Department   2005 - 2009
Teaching Assistant (fall and winter).
Lab instructor for Programming with Data Structures.

University of Alberta - Computing Science Department   2006 - 2008
Undergraduate Mentor.
Helped 1st year CS undergraduate students to acclimatize to university.

TALKS AND PRESENTATIONS

Keynote

TaiCHI – Hsinchu, Taiwan   2018
"Wearable Interactions Using Touch without a Touchscreen"

Invited Talks

University College London – UCLIC Research Seminar Series   2021
"Creating Smart Everyday Things"

University of Calgary – HCI Seminar Talk   2021
"Creating Smart Everyday Things"

Autodesk Research – HCI Seminar Talk   2021
"Creating Smart Everyday Things"

Massachusetts Institute of Technology - HCI Seminar Talk, Boston, MA, USA   2020
"Interactive Systems for Smart Everyday "things" with Better Sensing, UI, and Low Energy Consumption"

University of Washington – DUB Seminar Talk, Seattle, WA, USA   2019
"Wearable Interactions Using Touch without a Touchscreen"

Georgia Tech – GVU Center Brown Bag, Atlanta, Ga, USA   2018
"Wearable Interactions Using Touch without a Touchscreen"

Stanford University – HCI Group Brown Bag Talk, Stanford, CA, USA   2018
"Wearable Interactions Using Touch without a Touchscreen"

University of Toronto – DGP Colloquium. Toronto, ON, Canada   2018
"Wearable Interactions Using Touch without a Touchscreen"

University of Maryland, College Park – The College of Information Studies Colloquium. College Park, MD, USA   2018
"Wearable Interactions Using Touch without a Touchscreen"

UCSD – Design Lab Brown Bag Talk, San Diego, CA, USA   2018
"Wearable Interactions Using Touch without a Touchscreen"

Indiana University Bloomington – Department of Computer Science Colloquium. Bloomington, Indiana, USA   2018
"Wearable Interactions Using Touch without a Touchscreen"

Tufts University – Computer Science Rising Stars Colloquium Series, Boston, MA, USA   2018
"Wearable Interactions Using Touch without a Touchscreen"

National University of Singapore – Department of Computer Science Colloquium. Singapore   2018
"Wearable Interactions Using Touch without a Touchscreen"

National Taiwan University of Science and Technology – Department of Computer Science Colloquium. Taipei, Taiwan
"Wearable Interactions Using Touch without a Touchscreen"   2018

Nation University of Taiwan – IoX Center Colloquium. Taipei, Taiwan   2018
"Wearable Interaction Using Sensor, Haptics, and Interactive Module"

KAIST – Department of Computer Science Colloquium. Daejeon, Republic of Korea   2018
"Wearable Interactions Using Touch without a Touchscreen"

KAIST – Department of Industrial Design Colloquium. Daejeon, Republic of Korea   2018
"Wearable Interaction Using Sensor, Haptics, and Interactive Module"

City University of Hong Kong – School of Creative Media Colloquium. Hong Kong, China   2018
"Wearable Interactions Using Touch without a Touchscreen"

Aslla symposium – Gangneung, Republic of Korea   2018
"Input and Output on Wearable Devices Using Touch"

Xiamen University – Department of Digital Media Engineering Ph.D. Summer School. Xiamen, China   2018
"Wearable Interactions Using Touch without a Touchscreen"

University of New Brunswick – NextGen UX: User-Centred Design & Innovation Talk, Fredericton, NB, Canada   2018
"Wearable Interactions Using Touch without a Touchscreen"

Chinese CHI – ACM CHI 2019 Workshop Talk. Montreal, QC, USA   2018
"Wearable Interactions Using Touch without a Touchscreen"

University of Science and Technology of China – Department of Computer Science Summer School. Nanjing, China 2017
"Unleash Wearable Interactions from the Disappearing Touchscreens"

Dartmouth CTBH – Center for Technology and Behavioral Health Seminar Series   2017
"Unleash Wearable Interactions from the Disappearing Touchscreens"

Nanjing University – Department of Computer Science Summer School. Nanjing, China   2017
"Unleash Wearable Interactions from the Disappearing Touchscreens"

Fudan University – Department of Computer Science Colloquium. Shanghai, China   2017
"Unleash Wearable Interactions from the Disappearing Touchscreens"

Brown University – Department of Computer Science Colloquium. Providence, RI, USA   2017
"Unleash Wearable Interactions from the Disappearing Touchscreens"

Graphics Interface – Montreal, QC, Canada   2014
"Towards Mobile Interactions that Go Beyond the Touchscreen"

University of Waterloo – School of Computer Science. HCI Group Seminar. Waterloo, ON, Canada   2014
"Towards Mobile Interactions that Go Beyond the Touchscreen"

Queen's University – School of Computing. HCI Group Seminar. Kingston, ON, Canada   2014
"Towards Mobile Interactions that Go Beyond the Touchscreen"

York University – Department of EE&CS. HCI Group Seminar. Toronto, ON, Canada 2014
"Towards Mobile Interactions that Go Beyond the Touchscreen"

Microsoft Research Asia – HCI Group Seminar. Beijing, China 2012
"Blurring the Boundary of Direct & Indirect Input in a Shared Input Space."

Xi'an Jiaotong-Liverpool University – Department of Computer Science Seminar. Suzhou, China 2012
"Blurring the Boundary of Direct & Indirect Input in a Shared Input Space."

Kochi University of Technology – Department of Computer Science. HCI Group Seminar. Kochi, Japan 2010
"LensMouse: Augmenting the mouse with an interactive touch display."

PATENTS

[P.11] Infrared-Based Gesture Sensing and Detection Systems, And Apparatuses, Software, And Methods Relating to Same.
2020
X. D. Yang, J. Gong, Y. Zhang and X. Zhou (US: 10608632)

[P.10] Contact-Based Object Recognition on Interactive Fabrics using Capacitive Sensing 2020
T. Wu, A. Seyed, and X. D. Yang (Pending)

[P.9] Eyes-Free Text Entry on a Fingertip Keyboard 2020
Z. Xu, J. Gong, X. Bi, and X. D. Yang (Pending)

[P.8] Contextual Interactions on Interactive Fabrics with Inductive Sensing 2020
J. Gong, A. Seyed, and X. D. Yang (Pending)

[P.7] Enabling Prototyping of Virtual Circuits with Physical Proxies 2020
T. Wu, J. Gong, A. Seyed, and X. D. Yang (Pending)

[P.6] Inductive Sensors Including Arrays of Inductive Coils and Methods of Using Same. 2019
J. Gong and X. D. Yang (Pending)

[P.5] Self-Powered Gesture Recognition with Ambient Light 2019
T. Li, Y. Li, R. Patel, X. D. Yang, and X. Zhou (Pending)

[P.4] Detecting eating episodes with an ear-mounted sensor 2019
D. Kotz, J. Sorber, R. Halter, K. Odame, X. D. Yang, S. Bi, T. Wang, N. Tobias, J. Nordrum, G. Halvorsen, R. Peterson, and K. Caine (Pending)

[P.3] Always-Available Input through Finger Instrumentation. 2014
X. D. Yang, T. Grossman, D. Wigdor, and G. Fitzmaurice (US: 20140098067)

[P.2] Enhanced Target Selection for a Touch-Based Input Enabled User Interface. 2013
T. Grossman, G. Fitzmaurice, X. D. Yang, and P. Irani (US: 20130097550)

[P.1] Computer Input and Output Peripheral Device. 2012
P. Irani, E. Mak, and X. D. Yang (US: 20120092253)

SELECTED PRESS

EurekAlert "Smart tablecloth can find fruit and help with watering the plants" 2020

Engadget "Smart fabric can recognize the food you put on the table" 2020

Speaking Out for the Blind "Research brings 3D-printed circuit education tool for people with visual impairments" 2020

Scienmag "Research Brings Tech Tutorials to People with Visual Impairments" 2020

Huckster "TipText Lets You Enter Text Using Thumb-Tip Gestures"   2019

EurekAlert "Dartmouth lab introduces the next wave of interactive technology"   2019

Phys.Org "Energy harvesting and innovative inputs highlight tech show gadgetry"   2018

EurekAlert "Energy harvesting and innovative inputs highlight tech show gadgetry"   2018

Seeker "Reading Emotions from Ear Movements"   2018

TechXplore "Researchers bring smartwatch innovations to CHI2018"   2018

WatchPro "Dartmouth College aims to eliminate technical and practical barriers of smartwatches" 2018

Huckster.io "WrisText: Smartwatch Text Entry via Wrist Movements"   2018

Geeky Gadgets "Smartwatch Hand Gesture Typing App Concept WrisTex"   2018

ACM TechNews - SIGCHI Edition "Dartmouth to Debut Wearables That Warn and Wow at UIST 2017"   2017

ACM TechNews - SIGCHI Edition "Q&A With Ph.D. Student and Smartwatch Designer Jun Gong"   2017

EurekAlert "Dartmouth to Debut Wearables that Warn and Wow at UIST 2017"   2017

WEARABLE "RetroShape Smartwatch Concept Provides Users with Tactile Feedback"   2017

TechRadar "This Giant Smartwatch Prototype Has a Shape-Deforming Backplate"   2017

MIT Technology Review "This 3-in-1 Phone Will Make You Want to Share It with Strangers"   2017

Digital Trends "This Absurdly Overengineered Smartwatch Crawls, Tilts, and Slides on Your Wrist" 2017

EurekAlert "Dartmouth-led Team Develops Smartwatch with All the Moves"   2017

Wall Street Journal "The Smartwatch You Can Use with One Hand"   2016

Gizmodo "Smartwatch Prototype to Use Wrist as Joystick"   2016

TechCrunch "WristWhirl lets you control your smartwatch with hand gestures"   2016

Phys.Org "Doppio: Researchers unveil dual-screen smartwatch"   2016

Gizmodo "A Multi-Screen Smartwatch Might Actually Be a Brilliant Idea"   2016

Verge "Smartwatch concept puts two screens on your wrist"   2016

New Scientist "A phone, or an all-seeing sentry at your command?"   2013

Discovery News "A Phone That Can See Its Surroundings."   2013

Mashable "Lens Gives Your Phone Peripheral Vision."   2013

Discovery News "'Magic Finger' Swipes Smartphone Remotely."   2012

NBC News "Magic Finger Turns Everything into a Touch Surface."   2012

Engadget "'Magic Finger' Reads Gestures from any Surface."   2012

Gizmodo "Magic Thimble Turns the Entire World into a Touch Surface."   2012

Mashable "Send Texts from Your Pocket with This Handy Ring."   2012

Slashdot "Magic Finger Turns Any Surface into a Touch Interface."   2012

Phys.Org "Magic Finger Device Suggests New Day for Calling up Content."   2012

Hackaday "Magic Finger Input Device is a Camera on Your Finger Tip."   2012

Winnipeg SUN "Smart Touchscreen Built at U of M."   2011