AAKAR GUPTA

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RESEARCH INTERESTS

My research interests are in the area of Human-Computer Interaction. I have a specific interest in creating novel interactions for mobile, wearables, and immersive technologies using a wide range of techniques including sensing, haptics, signal processing, machine learning, and psychophysics. I am also eager to explore accessible interaction and technologies for the developing world.

EDUCATION

University of Toronto — Toronto, Canada
Ph. D. in Computer Science — *2013-2017*
Advisor: Prof. Ravin Balakrishnan
Thesis: "Extended Hand Attributes for Touch Input, Touch Output and Touchless Interaction"

University of Toronto — Toronto, Canada
M. S. in Computer Science — *2010-2012*
Advisor: Prof. Ravin Balakrishnan
Thesis: "Mobile Crowdsourcing in Developing Regions"

Dhirubhai Ambani Institute for Information and Communication Technology (DAIICT) — Ahmedabad, India
B. Tech. in Information and Communication Technology — *2005-2009*

EMPLOYMENT

Facebook Reality Labs, Redmond — 01/2019 –
Postdoctoral Research Scientist

University of Waterloo, Canada — 11/2017 – 12/2018
Postdoctoral Fellow. Advisor: Prof. Dan Vogel
Researched physical capabilties in immersive reality.

INRIA, Lille, France — 06/2016 – 09/2016
Research Intern. Advisors: Prof. Thomas Pietrzak and Dr. Nicolas Roussel
Researched freehand gestures for mid-air interaction.

INRIA, Lille, France — 02/2015 – 04/2015
Research Intern. Advisors: Prof. Thomas Pietrzak and Dr. Nicolas Roussel
Researched advanced tactile interfaces for wearables.

IBM Research, Bangalore India — 08/2012 – 01/2013
Research Intern. Advisors: Dr. Bikram Sengupta and Dr. Malolan Chetlur
Researched auto-alignments of lecture videos, slides, and other content (EduPal).

University of Toronto, Canada — 09/2010 – 01/2012
Graduate Research Assistant. Advisor: Prof. Ravin Balakrishnan
Researched mobile crowdsourcing to digitize local-language text.

Microsoft Research, Bangalore, India — 06/2011 – 08/2011
Visiting Researcher. Advisors: Dr. Bill Thies and Dr. Ed Cutrell
Conducted a six-week field study of mobile crowdsourcing for low-income workers.

Microsoft Research, Bangalore, India — 07/2009 – 05/2010
Research Intern. Advisors: Dr. Bill Thies and Dr. Kentaro Toyama
Researched and deployed biometric terminals for TB clinics in low-connectivity regions.

AWARDS AND HONORS

- Best Paper Nominee at ACM CHI 2016 for Direct Manipulation in Tactile Displays
- Best Paper Nominee at ACM CHI 2016 for DualKey: Miniature Screen Text Entry via Finger Identification
- Robert E. Lansdale/Okino Computer Graphics Fellowship, 2016
- MITACS Globalink Research Award, 2016
- University of Toronto SGS Conference Grant, 2016
- Robert E. Lansdale/Okino Computer Graphics Fellowship, University of Toronto, 2014
- ICTD 2013 Full Scholarship, Capetown
- GRAND 2011 Travel Scholarship, Vancouver
- ICTD 2010 Full Scholarship, London
- Worldwide Winner, MultiPoint Education Award, Microsoft Imagine Cup 2009
- National Runners Up (India), Software Design, Microsoft Imagine Cup 2009

PUBLICATIONS

REFEREED PUBLICATIONS

C.14 **Aakar Gupta**, Cheng Ji, Hui-Shyong Yeo, Aaron Quigley, and Daniel Vogel. (2019) RotoSwype: Word-gesture Typing using a Ring. *To appear in Proceedings of the ACM Conference on Human Factors in Computing Systems - **CHI 2019**.*

C.13 Hemant B. Surale, **Aakar Gupta**, Mark Hancock, and Daniel Vogel. (2019) TabletInVR: Exploring the Design Space for Using a Multi-Touch Tablet in Virtual Reality. *To appear in Proceedings of the ACM Conference on Human Factors in Computing Systems - **CHI 2019**.*

C.12 **Aakar Gupta**, Jiushan Yang, Ravin Balakrishnan. (2018). Asterisk and Obelisk: Motion Codes for Passive Tagging. *Proceedings of the ACM Symposium on User Interface Software and Technology - **UIST 2018**.*

C.11 **Aakar Gupta**, Antony Irudayaraj, Ravin Balakrishnan. (2017). HapticClench: Investigating Squeeze Sensations using Memory Alloys. *Proceedings of the ACM Symposium on User Interface Software and Technology - **UIST 2017**.*

C.10 **Aakar Gupta**, Thomas Pietrzak, Cleon Yau, Nicolas Roussel, Ravin Balakrishnan. (2017). Summon and Select: Rapid Interaction with Interface Controls in Mid-air. *Proceedings of the ACM International Conference on Interactive Surfaces and Spaces - **ISS 2017**.*

C.9 **Aakar Gupta**, Muhammed Anwar, Ravin Balakrishnan. (2016). Porous Interfaces for Small Screen Multitasking using Finger Identification. *Proceedings of the ACM Symposium on User Interface Software and Technology - **UIST 2016**.*

C.8 **Aakar Gupta**, Antony Irudayaraj, Vimal Chandran, Goutham Palaniappan, Khai Truong, Ravin Balakrishnan. (2016). Haptic Learning of Semaphoric Finger Gestures. *Proceedings of the ACM Symposium on User Interface Software and Technology - **UIST 2016**.*

C.7 **Aakar Gupta**, Thomas Pietrzak, Nicolas Roussel and Ravin Balakrishnan. (2016) Direct Manipulation in Tactile Displays. *Proceedings of the ACM Conference on Human Factors in Computing Systems - **CHI 2016**.* **(Best Paper Nominee)**

C.6 **Aakar Gupta** and Ravin Balakrishnan. (2016). DualKey: Miniature Screen Text Entry via Finger Identification. *Proceedings of the ACM Conference on Human Factors in Computing Systems - **CHI 2016**.* **(Best Paper Nominee)**

C.5 **Aakar Gupta**. (2015). Five Years of IndiaHCI. *Proceedings of the ACM International Conference on Human-Computer Interaction - **IndiaHCI 2015**.*

C.4 **Aakar Gupta**, William Thies, Edward Cutrell and Ravin Balakrishnan. (2012). mClerk: Enabling Mobile Crowdsourcing in Developing Regions. *Proceedings of the ACM Conference on Human Factors in Computing Systems - **CHI 2012**.*

C.3 Nupur Bhatnagar, Abhishek Sinha, Navkar Samdaria, **Aakar Gupta**, Shelly Batra, Manish Bhardwaj and William Thies. (2012). Biometric Monitoring as a Persuasive Technology: Ensuring Patients Visit Health Centers in India's Slums. *Proceedings of the International conference on Persuasive Technology: design for health and safety - **Persuasive 2012**.*

C.2 Saurabh Panjwani, **Aakar Gupta**, Navkar Samdaria, Edward Cutrell and Kentaro Toyama. (2010). Collage: A Presentation Tool for the Developing-World School Teacher. *Proceedings of the ACM International Conference on Information and Communication Technologies and Development - **ICTD 2010**.*

C.1 **Aakar Gupta**, Milan Saini and Anish Mathuria. (2009). Security Analysis of the Louis Protocol for Location Privacy. *Proceedings of the IEEE International Conference on Communication Systems and Networks - **COMSNETS 2009***

WORKSHOP, ORAL PAPERS

W.4 **Aakar Gupta** and Thomas Pietrzak. A New Haptic Interaction Paradigm. (2016). *In the CHI 2016 Workshop on Mid-Air Haptics and Displays: Systems for Uninstrumented Mid-Air Interactions.*

W.3 Navkar Samdaria, Praveen Shekhar, **Aakar Gupta** and David Hutchful. (2011). Teachers as Game Designers: Lessons from a Collaborative Learning Exercise. *Oral Paper at the ACM International Conference on Human-Computer Interaction - IndiaHCI 2011.*

W.2 Michael Paik, Navkar Samdaria, **Aakar Gupta**, Julie Weber, Nupur Bhatnagar, Shelly Batra, Manish Bhardwaj and William Thies. (2010). A biometric attendance terminal and its application to health programs in India. *Proceedings of the 4th ACM Workshop on Networked Systems for Developing Regions at MobiSys - NSDR 2010.*

W.1 **Aakar Gupta**, Praveen Shekhar, Navkar Samdaria, Mohit Jain and Joyojeet Pal. (2010). DISHA: Multiple Mice in Narrative Content-based Computer Aided Learning for Children. *Oral Paper at the ACM International Conference on Human-Computer Interaction - IndiaHCI 2010.*

PATENTS

- **Device Data Personalization.** Malolan Chetlur, **Aakar Gupta**, Bikram Sengupta, Ashay U. Tamhane. *US9535958 B2.* Granted.

INVITED TALKS

- Physical Interactions using Human Tactile and Kinesthetic Abilities.
  University of Calgary, Calgary. November 2018.
- Building Physical Interactions using Human Tactile and Kinesthetic Abilities.
  Facebook, Seattle. June 2018.
- Data-Driven Utilization of Human Capabilities for HCI.
  University of Edinburgh, Edinburgh. June 2018.
- Utilizing Human Capabilities for Designing Novel Interactions with Computers.
  Hong Kong University of Science and Technology (HKUST), Hong Kong. February 2018.
- Utilizing Human Capabilities for Designing Novel Interactions with Computers.
  University College London, London. January 2018.
- Touch Input, Touch Output and Touchless Interactions.
  Snap Research, Los Angeles. June 2017.
- Utilizing the Advanced Expressivity of Touch for Interactions.
  University of Waterloo, Waterloo. May 2017.
- Utilizing the Advanced Expressivity of Touch for Interactions.
  Autodesk Research, Toronto. December 2016.
- Finger-aware Interactions on Smartwatches.
  RIA Forum, University of Toronto, Toronto, March 2016.
- Ticketing Problems and a solution using Mobile Barcodes.
  Microsoft Research, Bangalore, India. January 2013.

- Mobile Crowdsourcing in Developing Regions.
  Xerox Research, Bangalore, India. June 2012.
- Mobile Crowdsourcing in Developing Regions.
  IBM Research, Bangalore, India. June 2012.
- Document Transcription using Mobile Crowdsourcing.
  GRAND 2011, Vancouver. May 2011.
- DISHA: Using Games for Health Awareness among kids.
  Microsoft Research, Bangalore, India. August 2009.

PRESS

- **"New Apps for the Bottom Billion"**. **MIT Technology Review**, May 7, 2012.

ADVISING

MASTERS

- Antony Albert Raj Irudayaraj (Spring 2016, Spring 2017) [C.8, C.11]
- Vimal Chandran (Spring 2016) [C.8]
- Goutham Palaniappan (Spring 2016) [C.8]

UNDERGRADUATE

- Ningshan Ouyang (Fall 2018)
- Zijun Pei (Fall 2018)
- Arjav Patel (Summer 2018)
- Robert Xu (Summer 2018)
- Ariel Ji (Winter 2018)
- Boris Lin (Winter 2018)
- Cheng Ji (Winter 2018)
- Isaac Chang (Fall 2017)
- Christina Chung (Summer 2017)
- Sophia Dizon (Summer 2017)
- Jiushan Yang (Summer 2017) [C.12]
- Cleon Yau (Spring 2017) [C.10]
- Muhammed Anwar (Fall 2015-Spring 2016) [C.9]

SERVICE

- Associate Chair at ACM CHI 2019 in the "Interaction Techniques, Devices and Modalities" subcommittee.
- Program Committee member at ACM Interactive Surfaces and Spaces - ISS 2018.
- Posters Chair at ACM Interactive Surfaces and Spaces - ISS 2018.
- Associate Chair at ACM CHI 2018 in the "Interaction Techniques, Devices and Modalities" subcommittee.
- Program Committee member at ACM Interactive Surfaces and Spaces - ISS 2018.
- SV (Student Volunteer) Chair at ACM Interactive Surfaces and Spaces - ISS 2017.
- Program Committee member at ACM IndiaHCI 2016.
- Reviewer for TOCHI 2018, CHI 2013-2017, UIST 2015-2018, Ubicomp 2016, ISS 2017, TEI 2017, MobileHCI 2016, IndiaHCI 2015.
- Workshop Organizer "MultiPoint Mouse Learning" for NCERT (National Council of Educational Research and Training), India. May 2009.

TEACHING EXPERIENCE

COURSE LECTURER

- "CS230: Introduction to Computers and Computer Systems". University of Waterloo. Summer 2018.

COURSE GUEST LECTURES

- "Statistical Methods in HCI". University of Toronto. Nov 2017.
  CSC428: Human-Computer Interaction. Instructor: Prof. Khai Truong
- "Designing Technologies for the Developing World". University of Toronto. Spring 2011.
  CSC318: Design of Interactive Computational Media. Instructor: Dr. Mike Massimi

TEACHING ASSISTANT

- CSC428: Human-Computer Interaction. University of Toronto. Spring 2017, Fall 2016, Spring 2016, Fall 2015, Fall 2014.
- CSC343: Introduction to Databases. University of Toronto. Summer 2017, Summer 2015, Spring 2011.
- CSC318: Design of Interactive Computational Media. University of Toronto. Fall 2014.
- BIG102: Internet: Saving Civilization or Trashing the Planet? University of Toronto. Spring 2014, Fall 2013.
- CSC108: Introduction to Computer Programming. University of Toronto. Summer 2013.
- CSC263: Data Structures and Analysis. University of Toronto. Spring 2013.
- CSC192: Data Structures and Algorithms. University of Toronto. Fall 2011.
- CSC209: Software Tools and Systems Programming. University of Toronto. Fall 2010.
- IT215: Systems Software. DAIICT. Spring 2009.
- EL103: Basic Electronic Circuits. DAIICT. Fall 2008.