Aneesh P. Tarun

Synaesthetic Media Lab
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Education

2017	Doctor of Philosophy in Computing School of Computing, Queen's University, Kingston, Canada *Thesis*: Electronic Paper Computers: Interacting with Flexible Displays for Physical Manipulation of Digital Information. *Committee*: Dr. Roel Vertegaal (Queen's University), Dr. Selim Akl (Queen's University), Dr. Ali Mazalek (Georgia Institute of Technology / Toronto Metropolitan University)
2010	Master of Science in Human-Computer Interaction Georgia Institute of Technology, Atlanta, USA *Masters Project*: Augmented Collaborative Spaces – Supporting remote collaborations with virtual worlds. *Supervisor*: Dr. Blair MacIntyre, Georgia Institute of Technology
2006	Bachelor of Engineering in Computer Science & Engineering Visvesvaraya Technological University (VTU), India

Research and Teaching Interest

Tangible and Embodied Interaction	Spatial Computing
Artificial Intelligence for HCI	Tools and Toolkit research
Research Methods in HCI	Prototyping

Grants

2020 – 2022	Collaborator. National Sciences Foundation (NSF) Discovery Research PreK-12 (DRK-12) Grant; total funding: US$3,000,000. Principal Investigator: Michael Tissenbaum
2021 – 2024	Collaborator. Social Sciences and Humanities Research Council (SSHRC) Insight Development Grant; total funding: $46,974. Principal Investigator: Daniel Harley

Patents

- Two full patent applications in *Intelligent and Attentive User Interfaces* under review.
- Roel Vertegaal, Paul Strohmeier, and Aneesh Tarun. "Interaction Techniques for Flexible Tablet PC and Paper Tablets." 2017. U.S. Patent No. 9,841,867. Washington, DC: U.S. Patent and Trademark Office.

Research Experience

Winter 2024 – Present	Senior Research Associate, Synaesthetic Media Lab, Toronto Metropolitan University, Canada Supervisor: Dr. Ali Mazalek I am currently exploring the research space of tangible and mixed reality applications for medical training. In addition, I am developing new interaction techniques to support creative and collaborative tasks with tangible objects in mixed reality.
Winter 2022 – Fall 2023	Senior Researcher, Huawei Media Lab, Huawei Technologies, Canada Supervisor: Dr. David Holman I worked on strategic HCI research to inform long-term product roadmap for AI-assisted mobile, smart home, and in-vehicle applications. I conducted mixed-methods research, ideation, prototyping of novel interactions and user experiences. I submitted two patent applications in the course of my research.
Summer 2017 – Winter 2022	Postdoctoral Fellow, Synaesthetic Media Lab, Ryerson University, Canada Supervisor: Dr. Ali Mazalek I applied Tangible and Embodied Interaction design principles to develop novel computing interfaces for computational discovery, education, telepresence, and virtual reality experiences.
Fall 2014 – Winter 2017	Research Assistant, Synaesthetic Media Lab, Ryerson University, Canada Supervisor: Dr. Ali Mazalek I designed, developed, and evaluated a software toolkit, REtk, for prototyping multi-device interaction ecologies.
Fall 2013 – Fall 2014	Interactive Media Developer, Xuuk Inc., Kingston, Canada Supervisor: Dr. Roel Vertegaal I investigated novel approaches to enabling interaction for an immersive virtual roller-coaster experience. I designed and developed a novel calibration technique for multiple depth cameras to capture a scene in 3D.
Fall 2010 – Fall 2014	Doctoral Researcher, Human Media Lab, Queen's University, Canada Supervisor: Dr. Roel Vertegaal At the Human Media Lab, I worked on developing interaction techniques and interfaces for flexible display devices. My work has involved brainstorming, sketching interaction concepts, prototyping devices and interfaces, building software frameworks, and evaluating interaction techniques.
Winter 2009 – Summer 2010	Research Assistant, Office of Information Technology, Georgia Institute of Technology, USA Supervisors: Russ Clark, Matt Sanders, I designed and developed context-aware applications (widgets) for the Georgia Tech campus email platform. These widgets allowed users quick access to location-aware and context-aware information. I also mentored teams for the Convergence Innovation Competition for two years.

Fall 2008 – Winter 2010	Project: Augmented Collaborative Spaces Supervisor: Dr. Blair MacIntyre, Georgia Institute of Technology, USA I designed interaction techniques and developed mixed reality environments to support collaborative work in Second Life and Wonderland.

Research Contributions

Current Works in Progress

- Responsive Ecologies Toolkit: AI assisted Authoring Tools to Create Tangible, Embodied, and Cross-Device Experiences for the Web. Manuscript in progress. To be submitted in Winter 2025.
- Parrot: Semi-autonomous Camera System to Enable Spatial Awareness and Enhance Remote Collaboration in Telepresence Robots. Data gathering in progress. To be submitted in Winter 2025.
- Fusibles: Tangible Interaction Techniques for Augmented Reality Collaboration. Design and Manuscript in progress. To be submitted for review in Winter 2025.

Peer-reviewed papers published in conference proceedings

- Afroza Sultana, Litong Zeng, Megan Wang, Stacy Cernova, Alexander Bakogeorge, Tudor Tibu, Dana Gnesdilow, Shafagh Hadinezhad, Xuesong Cang, Luigi Zaccagnini, **Aneesh P. Tarun**, Sadhana Puntambekar, Mike Tissenbaum, Ali Mazalek. 2024. A Plant Simulation Tool for Collaborative Biology Experiments in Middle-school Classrooms: An In-the-wild Study. Conditionally accepted in Graphics Interface 2024 (GI 2024) Conference.
- Afroza Sultana, Alex Bakogeorge, Tudor Tibu, Litong Zeng, Shafagh Hadinezhad, Luigi Zaccagnini, Xuesong Cang, Dana Gnesdilow, **Aneesh P. Tarun**, Sadhana Puntambekar, Mike Tissenbaum, and Ali Mazalek. 2023. In-class Collaborative Learning Environment for Middle School Children: A Usability Study. In Proceedings of the 22nd Annual ACM Interaction Design and Children Conference (IDC '23). ACM, 661–666.
- **Aneesh P. Tarun**, Veronica Andric, Lesi Yang, Tudor Tibu, Luigi Zaccagnini, Litong Zheng, Shafagh Hadinezhad, Xuesong Cang, William Goss, Samantha Baker, Dana Gnesdilow, Sadhana Puntambekar, Mike Tissenbaum, Ali Mazalek. 2022. SimSnap: Supporting Collaborative Learning through Reconfigurable Simulations. Computer supported collaborative learning (CSCL 2022), 1.
- Daniel Harley, **Aneesh P. Tarun**, Bonnie J. Stinson, Tudor Tibu, Ali Mazalek. 2021. Playing by Ear: Designing for the Physical in a Sound-Based Virtual Reality Narrative. In Proceedings of the Fifteenth International Conference on Tangible, Embedded, and Embodied Interaction (TEI ’21). ACM.
- **Aneesh P. Tarun**, Nauman M. Baig, Jack (Shen-Kuen) Chang, Rabia Tanvir, Sumaiyah Shihipar, and Ali Mazalek. 2019. Third Eye: Exploring the affordances of Third-Person View in Telepresence Robots. In International Conference on Social Robotics (ICSR’ 19). Springer, Cham, 707-716.
- Daniel Harley, **Aneesh P. Tarun**, Sara Elsharawy, Alexander Verni, Tudor Tibu, Marko Bilic, Alexander Bakogeorge, and Ali Mazalek. 2019. Mobile Realities: Designing for the Medium of Smartphone-VR. In Proceedings of the 2019 on Designing Interactive Systems Conference (DIS ‘19). ACM, 1131-1144.
- Roozbeh Manshaei, Uzair Mayat, **Aneesh Tarun**, Sean DeLong, David Chiang, Justin Digregorio, Shahin Khayyer, Apurva Gupta, Matthew Kyan, and Ali Mazalek. 2019. Tangible Tensors: An Interactive System for Grasping Trends in Biological Systems Modeling. In Proceedings of the 2019 on Creativity and Cognition (C&C’ 19). ACM, 41-52.

- Daniel Harley, **Aneesh P. Tarun**, Daniel Germinario, and Ali Mazalek. 2017. Tangible VR: Diegetic Tangible Objects for Virtual Reality Narratives. In Proceedings of the 2017 Conference on Designing Interactive Systems (DIS '17). ACM, 1253-1263.
- Audrey Girouard, **Aneesh P. Tarun**, and Roel Vertegaal. 2012. DisplayStacks: interaction techniques for stacks of flexible thin-film displays. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12). ACM, 2431-2440.

Peer-reviewed Extended Abstracts

- **Aneesh P. Tarun**, Andrea Bellucci, Ali Mazalek. 2017. Prototyping "In The Wild" Interaction Scenarios With RE/Tk. In ACM CHI'16 Workshop on Cross-Surface. San Jose, USA.
- Andrea Bellucci, **Aneesh P. Tarun**, Ahmed Sabbir Arif, and Ali Mazalek. 2016. Developing Responsive and Interactive Environments with the ROSS Toolkit. In Proceedings of the TEI '16: Tenth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '16). ACM, 782-785.
- **Aneesh P. Tarun**, Ahmed Sabbir Arif, Andrea Bellucci, Ali Mazalek. 2015. Responsive Objects, Surfaces and Spaces (ROSS): Framework for Simplifying Cross-Device Communication. In TEI 2015 Workshop on Interactive Infrastructures – Towards a Language for Distributed Interfaces (January 16, 2015). Stanford, CA, USA, 5 pages.
- **Aneesh P. Tarun**, Peng Wang, Audrey Girouard, Paul Strohmeier, Derek Reilly, and Roel Vertegaal. 2013. PaperTab: an electronic paper computer with multiple large flexible electrophoretic displays. In CHI '13 Extended Abstracts on Human Factors in Computing Systems (CHI EA '13). ACM, 3131-3134.
- **Aneesh P. Tarun**, Peng Wang, Paul Strohmeier, Audrey Girouard, Derek Reilly, and Roel Vertegaal. 2013. PaperTab: tablets as thin and flexible as paper. In CHI '13 Extended Abstracts on Human Factors in Computing Systems (CHI EA '13). ACM, 2881-2882.
- **Aneesh P. Tarun**, Byron Lahey, Audrey Girouard, Winslow Burleson, and Roel Vertegaal. 2011. Snaplet: using body shape to inform function in mobile flexible display devices. In CHI '11 Extended Abstracts on Human Factors in Computing Systems (CHI EA '11). ACM, 329-334.
- Markow, T., Ramakrishnan, N., Huang, K., Starner, T., Eicholtz, M., Garrett, S., Scarlata, A., Schooler, C., **Tarun, A**. & Backus, D. 2010. Mobile music touch: vibration stimulus in hand rehabilitation. In Conference on Pervasive Computing Technologies for Healthcare (PervasiveHealth). IEEE, 1-8.
- Russell J. Clark, Gautam Arora, Matt Sanders, Richard Bailey, **Aneesh P. Tarun**, and Ketaki Deo. 2009. WhereAmI: Location-based Applications and Services at Georgia Tech. In Proceedings of Conference on Principles, Systems and Applications of IP Telecommunications (IPTCOMM '09).
- **Aneesh P. Tarun**. 2008. Consolidated Human Interaction Device with an intuitive approach. In Proceedings of the Hewlett-Packard International Technical Conference (HP TechCon' 08).

Teaching Experience

Winter 2024	Sessional Lecturer, Design for Mobile Devices (CFPN542), Chang School of Continuing Education, Toronto Metropolitan University. Program Director: Jessica Cammaert In this **online course**, I teach design and prototyping of mobile applications to students in Guyana as a part of the Guyana Full Stack Developer program.
2020-Ongoing	Sessional Lecturer, Interaction Design (CFPN535), Chang School of Continuing Education, Toronto Metropolitan University. Program Director: Kimberly Carter

In this **online course**, I teach Interaction Design principles to adult learners from various educational backgrounds. I focus on applying interaction design principles to design and develop computer interfaces for mobile applications and websites. The students gain skills and knowledge to become future User Experience (UX) designers and developers.

2020-2022 — Sessional Lecturer, Interaction Design (FCD962/RTA962), RTA School of Media, Toronto Metropolitan University. Course Director(s): David Bouchard
I teach Interaction Design principles to the New Media students. I balance theory and practice in my classes to guide the students to learn and apply interaction design principles to create interactions for emerging technologies, physical computing, and new media art.

Fall 2021 — Sessional Lecturer, Web Design (RTA963), RTA School of Media, Toronto Metropolitan University. Course Director: David Bouchard
(online classroom) I teach graphic and web design from an aesthetic and functional point of view. The students learn about the software and technology needed to acquire, manipulate and render effective visual images, and experience the planning, production, and launch of a web site, using the latest web design and management software.

Winter 2021 — Sessional Lecturer, Coding for Creatives (FCD222), RTA School of Media, Ryerson University. Course Director: David Bouchard
(**online classroom**) I teach coding concepts to students from different disciplines. The students learn the basics of coding using P5.js and apply them through hands-on exercises in animation, visualization, and interaction.

Summer 2020 — Sessional Lecturer, Usability Assessment: Concepts, Methods and Tools (INF2171H), Faculty of Information, University of Toronto. Course Director: Dr. Kelly Lyons
In this course, I introduce various methods and tools for conducting usability assessments for interactive computing systems. Students will gain an understanding of usability concepts and will plan and conduct small-scale usability tests.

2015 – 2021 — Teaching Assistant and Project Lead, Embodied Digital Media (RTA 995 & MP 8995), Ryerson University. Course Director: Dr. Ali Mazalek
I conducted workshops and presented lectures on programming, digital fabrication, research methods, physical computing, and interaction design. My workshops have facilitated students from technical and non-technical backgrounds to learn new skills and engage in human-centered design and research activities. I have directly mentored 4-10 students each year and collaborated with them in interdisciplinary teams to design, build and evaluate interactive prototypes leading to published research in peer-reviewed conference proceedings.

2018 – 2020 — Course Instructor, Software Development, HackYourFuture Canada
I am a volunteer instructor to teach computational thinking and web technologies to refugees in Canada who are seeking new skills for employment. Through my engagements, I have been able to identify challenges for adult learners in a new

country. I designed workshops for instructors and learners to support effective intercultural teaching practices.

Invited Lectures and Course Workshops

Winter 2024	Design Thinking for Tangibles – Workshop. (RTA 995 / MP 8995) Embodied Digital Media, Ryerson University
Winter 2021	Beyond Programming Systems: Designing Human-Centered Computing Systems – Lecture. Department of Computer Science and Engineering, JSS Academy of Technical Education, India.
Fall 2019	When Art Critiques Technology – Workshop. (RTA82A) Thesis Project, Ryerson University
2019	Being an Effective Instructor for Adult Learners – Workshop. HackYourFuture Canada
2019 to 2021	Interaction Design and Usability – Workshop. (RTA 995 / MP 8995) Embodied Digital Media, Ryerson University
2015 to 2021	Prototyping Interactions and Advanced Programming – Workshop. (RTA 995 / MP 8995) Embodied Digital Media, Ryerson University
2015 to 2021	Physical Computing – Workshop. (RTA 995 / MP 8995) Embodied Digital Media, Ryerson University
2015 to 2020	Physical Fabrication – Workshop. (RTA 995 / MP 8995) Embodied Digital Media, Ryerson University
Fall 2012	User Interfaces & Usability – Lecture. (CISC 492) Software Startups, Queen's University
Fall 2012	Futuristic Interfaces with Human-Computer Interaction – Lecture. (EEE459) Engineering Human-Computer Interaction, Royal Military College
Spring 2010	The Art of making Creative Videos – Workshop. (CS 4803/8803 MAL) Mobile Applications and Services Class, Georgia Institute of Technology
Fall 2009	User Interfaces & Usability – Lecture. (CS 4261/8803 IMS) Mobile Applications and Services Class, Georgia Institute of Technology
Fall 2009	Developing Interactive Widgets on the Web – Workshop. (CS 4261/8803 IMS) Mobile Applications and Services Class, Georgia Institute of Technology

Dissemination of Research

Presentations and Invited Talks

- Aneesh P. Tarun. 2021. Playing by Ear: Designing for the Physical in a Sound-Based Virtual Reality Narrative. Paper presented at Fifteenth International Conference on Tangible, Embedded, and Embodied Interaction (TEI 2021).
- Aneesh P. Tarun. 2019. Third Eye: Exploring the affordances of Third-Person View in Telepresence Robots. Paper presented at the International Conference on Social Robotics (ICSR 2019), Madrid, Spain.
- Aneesh P. Tarun. 2019. Designing multi-device ecologies. Invited talk at TEDxQueensu Salon, Kingston, Canada.
- Aneesh P. Tarun. 2017. Critiquing Ubiquitous Computing. Invited talk and public discussion at TEDxQueensu Salon, Kingston, Canada.
- Aneesh P. Tarun. 2014. Paper-like computers with multiple flexible displays. Invited talk and demonstration at the TEDxQueensu, Kingston, Canada.
- Aneesh P. Tarun. 2013. PaperTab. Presentation at the Founders Forum, London, United Kingdom.

- Aneesh P. Tarun. 2013. PaperTab. Demonstration at OCE Discovery, Toronto, Canada.
- Aneesh P. Tarun. 2013. PaperTab: an electronic paper computer with multiple large flexible electrophoretic displays. Demonstration at the International Conference on Human Factors in Computing Systems (CHI 2013), Paris, France.
- Aneesh P. Tarun. 2013. PaperTab: tablets as thin and flexible as paper. Presentation and demonstration at the International Consumer Electronics Show (CES 2013), Las Vegas, USA.
- Aneesh P. Tarun. 2012. DisplayStacks: interaction techniques for stacks of flexible thin-film displays. Presentation and demonstration at the International Conference on Human Factors in Computing Systems (CHI 2012), Austin, TX, USA.
- Aneesh P. Tarun. 2012. PaperPhone. Presentation at the Founders Forum, London, United Kingdom.
- Aneesh P. Tarun. 2011. Snaplet: using body shape to inform function in mobile flexible display devices. Demonstration at the International Conference on Human Factors in Computing Systems (CHI 2011), Vancouver, Canada.

Conference Workshops

- **Aneesh P. Tarun**, Victor Alexandru, Sarthak Marwaha, and Ali Mazalek. 2020. Tangible Web: Supporting Mobile and Cross-Device Interactions. Workshop at the MUM ’20: 19th International Conference on Mobile and Ubiquitous Multimedia. Essen, Germany.
- Andrea Bellucci, **Aneesh P. Tarun**, Ahmed Sabbir Arif, Ali Mazalek. 2015. ROSS Toolkit: An Infrastructure and API for Building Interactive Environments. In ITS 2015 Workshop on Shared Infrastructures for Tangible Tabletops & Interactive Surfaces (November 15, 2015). Madeira, Portugal, 4 pages.
- **Aneesh P. Tarun** and Peng Wang. 2012. Designing and building inexpensive flexible circuits. In Proceedings of the Sixth International Conference on Tangible, Embedded and Embodied Interaction (TEI ‘12). ACM, 375-377.

Graduate Student Mentoring

Daniella Kalinda, PhD student in Media and Design Innovation, Toronto Metropolitan University
Ian Robinson, PhD student in Media and Design Innovation, Toronto Metropolitan University
Jared Lorenz, Masters in Digital Media, Toronto Metropolitan University
Sarthak Marwaha, Masters in Digital Media, Toronto Metropolitan University
Assem Kroma, Masters in Media Production, Toronto Metropolitan University
Ramy Saboungui, Masters in Digital Media, Toronto Metropolitan University
David Parker, MSc in Computing, Queen's University
Peng Wang, MSc in Computing, Queen's University

Academic and Community Service

2022 - present	Associate Chair - Late-Breaking Work - Conference on Human Factors in Computing Systems (CHI), ACM
2019 - present	Associate Chair - Conference on Creativity and Cognition (C&C), ACM
2020 - 2021	Committee Member – Dimensions Pilot Program, Faculty of Communication & Design, Toronto Metropolitan University. The Dimensions program is a Federal initiative to assess systemic barriers in post-secondary SRC environments.
2017 - 2021	Associate Chair - Conference on Computer Graphics, Visualization and Human-Computer Interaction (GI), CH-CCS

2017 - 2021	Associate Chair - International Conference on Advanced Learning Technologies (ICALT), IEEE

Scholarly Peer Reviewer

2013 - present	Reviewer (Blind). Tangible Embedded and Embodied Interaction (TEI), ACM.
2013 - present	Reviewer (Blind). Conference on Human Factors in Computing Systems (CHI), ACM.
2017 - present	Reviewer (Blind). Conference on Designing Interactive Systems (DIS), ACM.
2015	Reviewer (Blind). International Conference on Interactive Surfaces and Spaces (ISS), ACM.
2014	Reviewer (Blind). International Symposium on Wearable Computers (ISWC), ACM.

Media Appearances

Broadcast Interviews

2013/02/12	Thin is in, 7 News, Fox WWNY TV
2013/01/11	Paper-thin computer debuts at CES, Moments of Innovation, Reuters
2013/01/09	Future Tech Week, Daily Planet, Discovery Canada
2013/01/08	Technology at CES 2013, ITV News, ITV

Text Interviews

2013/07/28	PaperTab to redefine the future of personal computing forever, Hindustan Times. http://www.pressreader.com/india/hindustan-times-amritsar/20130728/282252368147633
2013/01/11	Touch Screens that Curve, Bend, and Even Touch Back, MIT Technology Review. https://www.technologyreview.com/s/509761/touch-screens-that-curve-bend-and-eventouch-back/
013/01/09	GRAND researchers unveil revolutionary ‘paper tablet’ at 2013 CES, GRAND network. http://grand-nce.ca/archives/news/2013/grand-researchers-unveil-revolutionary-papertablet.html