

Johann Wentzel

HCI Researcher - Virtual and Augmented Reality

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Education

University of Waterloo

Doctor of Philosophy (PhD) - Computer Science (Human-Computer Interaction), GPA: 96%

Thesis (in progress): *Bring-Your-Own Input: Context Aware Multi-Modal Input for More Accessible VR*

Advisor: Daniel Vogel

Waterloo, ON

May 2020 - Present

University of Waterloo

Master of Mathematics - Computer Science, GPA: 96%

Thesis-based program [T1], resulting in an award-winning publication [C2].

Waterloo, ON

Sept 2018 - Apr 2020

University of Calgary

Bachelor of Science - Computer Science, GPA: 96%

Graduated with First Class Honours (published paper [C1] plus high GPA).

Calgary, AB

Sept 2011 - Jun 2017

University of Calgary

Bachelor of Commerce - Business Technology Management (BTMA), GPA: 96%

Winner of Haskayne School of Business Silver Medallion (highest graduating GPA in BTMA program).

Calgary, AB

Sept 2011 - Jun 2017

Work Experience

Meta Reality Labs

Research Scientist Intern, Input Explorations Team

- Designed, developed, statistically evaluated, and presented new multi-modal gaze-tracking interfaces for mixed reality as part of a product research team.

New York, NY

Sept 2022 - Jan 2023

Microsoft Research

Research Intern, Ability Team

- Primary author and developer on an in-progress VR accessibility research and development project.

Redmond, WA (Remote)

Jun 2022 - Sept 2022

Research Intern, Ability Team

- Primary author of an accessibility research publication [C3] using qualitative methods to investigate the use of multi-device input configurations by people with mobility limitations.

May 2021 - Aug 2021

Autodesk Research

Research Intern, User Interface Research Group

- Primary author and sole developer on a VR productivity research project [P1].
- Submitted the results to a top-tier HCI conference.

Toronto, ON

Jan 2020 - May 2020

New York University

Visiting Scholar, Future Reality Lab

- Developed a simultaneous, multi-user augmented reality audio solution for an external client.
- Solo developer for an iOS project using ARKit and MultipeerConnectivity for multiplayer.

New York, NY

Sept 2019 - Dec 2019

Deloitte

iOS/Web/AR Developer (Business Technology Analyst)

- Created an iOS app for navigation and SAP Cloud interaction, implementing OCR functions and a custom keyboard UI.
- Created an augmented reality eCommerce demo for industry clients using Unity, Vuforia, and Node.js.

Calgary, AB

Aug 2017 - Aug 2018

Critical Mass

User Experience Design Intern

- Created interactive design prototypes for user testing, using code-based animation tools.
- Created and annotated user flows and wireframes for various websites and software.

Calgary, AB

May 2016 - Aug 2016

University of Calgary

Undergraduate Researcher

Calgary, AB

Sept 2014 - Sept 2015

- Developed an augmented reality interface between Google Glass, Kinect, and a Baxter humanoid robot.
- Published study findings as first author [C1], winning a Calgary Undergraduate Research Award.

SMART Technologies

User Experience Design Intern

Calgary, AB

May 2014 - Aug 2014

- Created automated data entry scripts to track and close user feature requests, reducing manual entry time by 50%.
- Created various full-process mockups for products, from concepts and sketches to videos and interactive prototypes.

Publications

Note about conference papers: In Human-Computer Interaction, conference proceedings are the preferred publication venue since they are timelier and typically have the greatest impact. Top-tier conferences are very selective with rigorous multi-stage reviews of full manuscripts creating high quality fully archival proceedings.

Note about venues: CHI (ACM Conference on Human Factors in Computing Systems) is recognized as a very top tier HCI conference (ranked #1 on Google Scholar). The average acceptance rate for CHI is 23%.

Conference Papers

- [C3] **Johann Wentzel**, Sasa Junuzovic, James Devine, John Porter, Martez Mott. 2022. *Understanding How People with Limited Mobility Use Multi-Modal Input*. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '22). DOI: <https://doi.org/10.1145/3491102.3517458>
- [C2] **Johann Wentzel**, Greg d'Eon, and Daniel Vogel. 2020. *Improving Virtual Reality Ergonomics through Reach-Bounded Non-Linear Input Amplification*. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '20). DOI: <https://doi.org/10.1145/3313831.3376687>
* **Best Paper Honourable Mention (top 5% of submitted papers)**
- [C1] **Johann Wentzel**, Daniel Rea, James Young, and Ehud Sharlin. 2015. *Shared Presence and Collaboration Using a Co-Located Humanoid Robot*. In Proceedings of the 3rd International Conference on Human-Agent Interaction (HAI '15). DOI: <https://doi.org/10.1145/2814940.2814995>

Workshops and Extended Abstracts

- [E4] **Johann Wentzel**. *Bring-Your-Own Input: Context-Aware Multi-Modal Input for More Accessible Virtual Reality*. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '23 Doctoral Consortium). DOI: <https://doi.org/10.1145/3544549.3577056>
- [E3] **Johann Wentzel** and Lesley Istead. 2022. *Volumetric and User-Centric Rendering Techniques for Lens Flare and Film Grain in Virtual Reality Environments*. In the 2022 European Conference on Visual Media Production Extended Abstracts (CVMP '22). [PDF]
- [E2] **Johann Wentzel**, Daekun Kim, and Jeremy Hartmann. 2021. *Same Space, Different Place: Designing for Differing Physical Spaces in Social Virtual Reality*. In the CHI 2021 workshop "Social VR: A New Medium for Communication and Collaboration". [More info | PDF]
- [E1] Josh Urban Davis, **Johann Wentzel**. 2021. *Font Your Friends and Loved Ones: On the Utility of Ugly Interfaces*. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '21). DOI: <https://doi.org/10.1145/3411763.3450371>

Patents

- [P1] **Johann Wentzel**, Fraser Anderson, Tovi Grossman, and George Fitzmaurice. *Transitions between states in a hybrid virtual reality desktop computing environment*. 2022. [Google Patents]

Theses and Dissertations

- [T1] **Johann Wentzel**. 2020. *Reach-Bounded, Non-Linear Input Amplification for More Comfortable Virtual Reality*. Master's thesis, UWSpace. [Link]

Awards and Scholarships

2021-2024	Alexander Graham Bell Graduate Scholarship (NSERC CGS-D) (national) - \$105,000 over 3 years Awarded to top PhD students based on academic merit, research potential, and leadership.
2021-2024	President's Graduate Scholarship (institutional) - \$30,000 over 3 years Top-up funding awarded by University of Waterloo to winners of the NSERC CGS-D.
2021	Ontario Graduate Scholarship, PhD (provincial, declined for NSERC CGS-D) - \$15,000 Awarded to top PhD students based on academic excellence and research potential.
2020	Best Paper Honourable Mention (top 5% of submitted papers), CHI 2020 for [c2] "Improving Virtual Reality Ergonomics [...]" with Greg d'Eon and Daniel Vogel.
2020	Ontario Graduate Scholarship, PhD (provincial) - \$15,000 Awarded to top PhD students based on academic excellence and research potential.
2020	President's Graduate Scholarship (institutional) - \$5,000 Top-up funding awarded by University of Waterloo to winners of provincial scholarships.
2019	Alexander Graham Bell Graduate Scholarship (NSERC CGS-M) (national) - \$17,500 National scholarship for top Master's students based on academics and research potential.
2019	Ontario Graduate Scholarship, Master's (provincial) - \$15,000 Provincial scholarship for top Master's students based on academic excellence and research potential.
2019	David Johnston International Experience Award (institutional) - \$2,500 Awarded to graduate students to support international work and study opportunities.
2018 - 2022	David R. Cheriton Graduate Scholarship (institutional) - \$20,000 over 2 years, won twice Awarded to top graduate students based on academic excellence and research potential.
2018	President's Graduate Scholarship (institutional) - \$5,000 Awarded to top Master's students based on academic excellence and research potential.
2018	Domestic Masters Entrance Award (institutional) - \$5,000 Awarded to top incoming Master's students based on academic excellence.
2018	Alexander Graham Bell Graduate Scholarship (NSERC CGS-M) (national, declined) - \$17,500 Offered from University of Saskatchewan and Calgary, declined as I chose to attend Waterloo.
2017	Haskayne School of Business Silver Medallion in Business Technology Management Awarded to the Business Technology Management student with the highest graduating GPA.
2016	University of Calgary Undergraduate Merit Award (institutional) - \$800 Awarded to top continuing undergraduate students.
2015	Program for Undergraduate Research Experience Award (institutional) - \$6,000 Merit-based research funding for undergraduate students in the UCalgary Honours program.
2014	Alistair H. Ross Memorial Scholarship (institutional) - \$3,750 Awarded to top continuing undergraduate students based on GPA.
2011	President's Admission Scholarship (institutional) - \$2,500 Awarded to top incoming undergraduate students based on academic excellence.
2011-2017	Dean's List, University of Calgary Maintained a GPA above 3.6/4.0 while enrolled full-time in undergraduate studies.

Supervision

Falah Shazib, University of Waterloo undergraduate, Jan 2021 - Apr 2021

- "Exploring the effects of hierarchy within 3D marking menus in virtual reality"

Daekun Kim, University of Waterloo undergraduate, Sept 2020 - Sept 2022

- "Exploring the effects of depth perception on item selection in virtual reality"

Invited Talks

- **Conference Presentations:** CHI 2023, CHI 2022, CHI 2020 (virtual), Waterloo CHI 2020 (virtual)
- *Accessibility and Extended Reality*. UWaterloo Teaching and Learning Conference 2023. Waterloo, ON, Canada.
- *Breaking Into XR Research*. UWaterloo VR Club, Waterloo, ON, Canada
- *Robotics in Manufacturing / Working Alongside Baxter*. ACAMP Seminar Series - Unmanned Vehicles, Robotics, and Intelligent Systems Seminar. Calgary, AB, Canada.
- *Shared Presence and Collaboration with a Co-Located Humanoid Robot*. University of Calgary Undergraduate Research Symposium. Calgary, AB, Canada.

Press

- **Government Technology**, interview, 2022. *What Is the Metaverse's Future in K-12 and Higher Ed?*
<https://www.govtech.com/education/higher-ed/what-is-the-metaverses-future-in-k-12-and-higher-ed>

Side Projects

Self-Configured Home Server

- A fully self-assembled home server for VPN, file hosting, smart home services, and multiplayer games.
- Configured using Proxmox and Docker, with incoming traffic routed via NGINX.

VR HCI Research Project: 'Marimba'

- A drum-like virtual keyboard that allows users to type more quickly and comfortably in virtual reality.
- Early user testing showed this technique provided a similar typing speed and lower error rate than others.

iOS & Android Apps: 'Coril150'

- As a solo freelance developer, created a news reader app for Coril Holdings Ltd.'s Canada 150 celebrations.
- Duties included UI design, prototyping, and native implementation on both Android and iOS.

Service and Volunteering

Teaching

Instructional Apprentice, University of Waterloo

Led computer labs as a lab instructor for an introductory computer science course.

Waterloo, ON

Ongoing

Academic Service

- **Program Committee Member:** GI 2022
- **Session Chair:** Waterloo CHI 2020 (online CHI event in response to COVID-19)
- **Student Volunteer:** UIST 2021, CHI 2021, UIST 2019
- **Peer Reviewer:** CHI, UIST, CHI PLAY, MobileHCI, ISS (all over several years)

Waterloo, ON

Ongoing

Calgary Community Theatre

Actor/Musician

- Cast member, orchestra performer, and technical setup advisor for various musical theatre productions in Calgary.

Calgary, AB

June 2013 - June 2018

University of Calgary Orientation

Orientation Leader

- Led large groups of incoming students on tours of campus, including one-on-one advice for campus life.
- Facilitated several campus-wide volunteering events to build awareness of University of Calgary services.

Calgary, AB

Sept 2013 - Sept 2015

Alberta Youth Choir

Vocalist

- Performed as a vocal bass in a provincial honour choir, offering touring performances in various venues around Alberta.

Calgary, AB

Oct 2013 - Oct 2015

Skills

- **Programming Languages:** C#, Swift, Python, HTML, CSS, Javascript, Objective-C, C++
- **Dev tools:** Unity, Xcode, Android Studio, Bootstrap, React, Angular 4, d3.js, jQuery, Wordpress, NodeJS, Git.
- **Design tools:** Sketch, Framer.js, Principle, Balsamiq Mockups, Adobe Creative Cloud.
- **Hobbies:** Home servers, game development for VR, AR, iOS. Classically trained in piano, clarinet, voice.