Johann Wentzel

HCI Researcher - Virtual and Augmented Reality

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Education

University of Waterloo **Waterloo, ON**
Doctor of Philosophy (PhD) - Computer Science (Human-Computer Interaction), GPA: 96% *May 2020 - Present*
Thesis (in progress): *Bring-Your-Own Input: Context Aware Multi-Modal Input for More Accessible VR*
Advisor: Daniel Vogel

University of Waterloo **Waterloo, ON**
Master of Mathematics - Computer Science, GPA: 96% *Sept 2018 - Apr 2020*
Thesis-based program **[T1]**, resulting in an award-winning publication **[C2]**.

University of Calgary **Calgary, AB**
Bachelor of Science - Computer Science, GPA: 96% *Sept 2011 - Jun 2017*
Graduated with First Class Honours (published paper **[C1]** plus high GPA).

University of Calgary **Calgary, AB**
Bachelor of Commerce - Business Technology Management (BTMA), GPA: 96% *Sept 2011 - Jun 2017*
Winner of Haskayne School of Business Silver Medallion (highest graduating GPA in BTMA program).

Work Experience

Meta Reality Labs **New York, NY**
Research Scientist Intern, Input Explorations Team *Sept 2022 - Jan 2023*
- Designed, developed, statistically evaluated, and presented new multi-modal gaze-tracking interfaces for mixed reality as part of a product research team.

Microsoft Research **Redmond, WA (Remote)**
Research Intern, Ability Team *Jun 2022 - Sept 2022*
- Primary author and developer on an in-progress VR accessibility research and development project.

Research Intern, Ability Team *May 2021 - Aug 2021*
- 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.

Autodesk Research **Toronto, ON**
Research Intern, User Interface Research Group *Jan 2020 - May 2020*
- Primary author and sole developer on a VR productivity research project **[P1]**.
- Submitted the results to a top-tier HCI conference.

New York University **New York, NY**
Visiting Scholar, Future Reality Lab *Sept 2019 - Dec 2019*
- 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.

Deloitte **Calgary, AB**
iOS/Web/AR Developer (Business Technology Analyst) *Aug 2017 - Aug 2018*
- 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.

Critical Mass **Calgary, AB**
User Experience Design Intern *May 2016-- Aug 2016*
- Created interactive design prototypes for user testing, using code-based animation tools.
- Created and annotated user flows and wireframes for various websites and software.

University of Calgary **Calgary, AB**

Undergraduate Researcher *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 **Calgary, AB**

User Experience Design Intern *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.* To appear in the 2023 CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '23 Doctoral Consortium).

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

Invited Talks

- **Conference Presentations:** CHI 2022, CHI 2020 (virtual), Waterloo CHI 2020 (virtual)
- *Accessibility and Extended Reality.* UWaterloo XR Community of Practice. 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 **Waterloo, ON**
Instructional Apprentice, University of Waterloo *Ongoing*
Led computer labs as a lab instructor for an introductory computer science course.

Academic Service **Waterloo, ON**
Ongoing
- **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)

Calgary Community Theatre **Calgary, AB**
Actor/Musician *June 2013 - June 2018*
- Cast member, orchestra performer, and technical setup advisor for various musical theatre productions in Calgary.

University of Calgary Orientation **Calgary, AB**
Orientation Leader *Sept 2013 - Sept 2015*
- 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.

Alberta Youth Choir **Calgary, AB**
Vocalist *Oct 2013 - Oct 2015*
- Performed as a vocal bass in a provincial honour choir, offering touring performances in various venues around Alberta.

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.