

# Johann Wentzel

HCI Researcher - Virtual and Augmented Reality

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## Education

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### University of Waterloo

*Doctor of Philosophy (PhD) - Computer Science*

Thesis (tentative): *Improving VR for Productivity - Accessibility, Techniques, and Designs*  
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].  
Advisor: Daniel Vogel

**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

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### University of Waterloo

*Graduate Researcher and Teaching Assistant*

- Research explores novel interaction techniques in virtual reality (VR) and augmented reality (AR).
- Lab instructor for several undergraduate programming classes.

**Waterloo, ON**

*Sept 2018 - Present*

### Autodesk Research

*Research Fellow, User Interface Research Group*

- Primary author and sole developer on a VR HCI research project.
- 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 MultiplayerConnectivity 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.
- Created a loan application web-app for a client using Angular 4 and Salesforce.

**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*

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

**Calgary, AB**

*Sept 2014 - Sept 2015*

### SMART Technologies

*User Experience Design Intern*

- 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.

**Calgary, AB**

*May 2014 - Aug 2014*

## Awards and Scholarships

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|             |   |
|-------------|---|
| 2020        | <b>Best Paper Honourable Mention (top 5% of submitted papers), CHI 2020</b><br>for [C2] "Improving Virtual Reality Ergonomics [...]" with Greg d'Eon and Daniel Vogel.                            |
| 2020        | <b>Ontario Graduate Scholarship, PhD (provincial) - \$15,000</b><br>Provincial scholarship for top PhD students based on academic excellence and research potential.                              |
| 2020        | <b>President's Graduate Scholarship (institutional) - \$5,000</b><br>Awarded to top PhD students based on academic excellence and research potential.   |
| 2019        | <b>Alexander Graham Bell Graduate Scholarship (NSERC CGS-M) (national) - \$17,500</b><br>National scholarship for top Master's students based on academics and research potential.                |
| 2019        | <b>Ontario Graduate Scholarship, Master's (provincial) - \$15,000</b><br>Provincial scholarship for top Master's students based on academic excellence and research potential.                    |
| 2019        | <b>David Johnston International Experience Award (institutional) - \$2,500</b><br>Awarded to graduate students to support international work and study opportunities.                             |
| 2018 - 2022 | <b>David R. Cheriton Graduate Scholarship (institutional) - \$10,000 per year for 2 years, won twice</b><br>Awarded to top graduate students based on academic excellence and research potential. |
| 2018        | <b>President's Graduate Scholarship (institutional) - \$5,000</b><br>Awarded to top Master's students based on academic excellence and research potential.  |
| 2018        | <b>Domestic Masters Entrance Award (institutional) - \$5,000</b><br>Awarded to top incoming Master's students based on academic excellence.   |
| 2018        | <b>Declined: NSERC CGS-M (national) - \$17,500</b><br>Offered from University of Saskatchewan and Calgary, declined as I chose to attend Waterloo.  |
| 2017        | <b>Haskayne School of Business Silver Medallion in Business Technology Management</b><br>Awarded to the Business Technology Management student with the highest graduating GPA.                   |
| 2016        | <b>University of Calgary Undergraduate Merit Award (institutional) - \$800</b><br>Awarded to top continuing undergraduate students.   |
| 2015        | <b>Program for Undergraduate Research Experience Award (institutional) - \$6,000</b><br>Merit-based research funding for undergraduate students in the UCalgary Honours program.                  |
| 2014        | <b>Alistair H. Ross Memorial Scholarship (institutional) - \$3,750</b><br>Awarded to top continuing undergraduate students based on GPA.  |
| 2011        | <b>President's Admission Scholarship (institutional) - \$2,500</b><br>Awarded to top incoming undergraduate students based on academic excellence.  |
| 2011-2017   | <b>Dean's List, University of Calgary</b><br>Maintained a GPA above 3.6/4.0 while enrolled full-time in undergraduate studies.  |

## Publications

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**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

[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>

### Theses and Dissertations

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

## Invited Talks

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- **Conference Presentations:** Waterloo CHI 2020 (virtual)
- *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.

## Selected Projects

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### 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.

### VR/IoT Research Project: 'VR-Bounce'

- An Arduino-powered wireless movement accessory for virtual reality.
- Uses IMUs to detect the user bouncing their heels, which is then processed and turned to player movement.

### Extra Credits Game Jam: 'MagnaGirl'

- A side-scrolling platformer game using magnetic attraction and repulsion as a core movement mechanic.
- Contributed to the game's level design, as well as programming magnet physics and player movement.

### 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.

### Undergraduate HCI Project: 'Proxemic Bulletin Board'

- A depth-aware bulletin board that displays different information depending on the user's distance.
- Designed and developed the entire project, from initial sketches to a working prototype.

## Volunteering and Service

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### Academic Service

**Waterloo, ON**

- **Session Chair:** Waterloo CHI 2020 (online CHI event in response to COVID-19)
- **Student Volunteer:** UIST 2019
- **Peer Reviewer:** UIST 2020, ISS 2019, CHI 2019 Late-Breaking Work

*Ongoing*

### 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 - Sep 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

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- **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:** 3D printing, custom Android ROMs, game development, VR/AR interfaces (Leap Motion, etc).