Rocco Ruan

rruan@cs.ubc.ca ❖ (647) 963-8918 ❖ Vancouver, Canada ❖ https://roccoruan.com/portfolio/

EDUCATION

University of British Columbia **Sep 2023 – present**
PhD-Track Master of Computer Science *Vancouver, Canada*

- 91% average across 4 grad courses, including 3 design project courses - Transfer to PhD planned for Jan 2025
- Researching and developing video games with social touch features to support online mental wellness
- Refereed contributions:
  - A. Adibi, **R. T. L. Ruan**, X. Yin, Y. Ding, K. E. MacLean. **Using language models to integrate clinical decision support and note taking: a qualitative study.** Abstract presented at ERS 2024
  - **R. T. L. Ruan**, A. Adibi, K. E. MacLean. **Navigating Three VITal Interdependent Qualities for Successful Cross-Community Collaboration.** Workshop paper accepted at CHI 2024

University of Toronto **Sep 2018 – May 2023**
Bachelor of Applied Science – Engineering Science, Robotics Engineering *Toronto, Canada*

- 3.7 cGPA out of 4, 92% average across 7 design project courses, graduated with honours

INDUSTRY EXPERIENCE

Software Engineer Intern **Jan 2021 – Aug 2021**
MDA (formerly MacDonald, Dettwiler and Associates) *Kanata, Canada*

- 1 of only 4 software developers designing and implementing C++ software for a $13M+ LIDAR/imaging system to be used on **Canadarm2** on the **International Space Station**
- Developed and documented modular test automation software and UI for 5+ subsystems
- Reworked ground software with multithreading to tolerate delays caused by long-range communications
- Provided software/systems support for ML spacecraft tracking and a NASA-commissioned camera project

Software Developer Intern **May 2020 – Aug 2020**
Cognitive Systems Corporation *Waterloo, Canada*

- Designed embedded Micropython software to facilitate motion detection using CFR of WiFi routers
- Optimized runtime performance of a key algorithm by 50% using custom performance-profiling tools
- Developed features and improvements shipped to the 1000+ users of Plume Motion
- Drove research to increase reliability and spatial coverage of motion detection using data-driven methods

TEACHING EXPERIENCE

UBC - TA for Introduction to Human-Computer Interaction Methods **Sep 2024 – Apr 2025**

- Taught human-centred design and UI/UX concepts to ~60 undergraduate students per term
- Mentored 12 student projects designing user interface research projects and design prototypes

UofT - TA for Engineering Science 2nd Year Capstone Design Course **Sep 2021 – Apr 2023**

- Taught mechatronics and engineering design concepts to ~80 2nd year undergraduate students per term
- Mentored ~30 student projects designing IOT systems for global stakeholders (eg. **United Nations**)
- Mediated student-student and student-faculty conflict through consistent and empathetic communication

SERVICE AND EXTRACURRICULAR EXPERIENCE

UBC Computer Science - Student Development Committee **May 2024 - present**

- Attending monthly meetings and co-organizing events towards undergrad and grad career development

Mental Wellness Advocate **Sep 2021 - Apr 2023**
UofT Engineering Mental Wellness Policy Committee *Toronto, Canada*

- Designed a comprehensive student survey to generate recommendations to faculty regarding mental wellness
- Assisted with planning of town halls discussing sexual violence, gender equity, and mental wellness

Arm Subsystem Lead - Robotics for Space Exploration (RSX) club at UofT **May 2020 – Aug 2021**
- Supervised ~15 students in mechanical and software redesign of a large 6-DOF robotic arm for a rover
- Increased subsystem member attendance and retention by ~200% by emphasizing learning and involvement

Team Member - UofT Aerospace Team, Space Systems **Sep 2019 – Jun 2020**
- Drove link budget development for a high-bitrate data link for an LEO Earth-imaging CubeSat

UNDERGRADUATE RESEARCH PROJECTS

Undergraduate Thesis (w/ Prof. M. Mackay) **Sep 2022 – Apr 2023**
- Designed and piloted a field experiment investigating methods for robots to request assistance from bystanders
- Developed a custom teleoperated mobile robot for experiments, including chassis, electronics, and software

Research Assistant (w/ Prof. J. Tsotsos at York University) **May 2022 – Aug 2022**
- Developed an accessible, touch-friendly UI for an autonomous wheelchair robot using QT
- Implemented embedded C code to control all robot parts, including PID speed control, ROS integration, etc.

Research Assistant (w/ Prof. D. Wigdor, ex-Director at Meta Reality Labs Toronto) **Jan 2022 – May 2022**
- Developed method to deploy robotic sensors in 3D-printed tubing
- Used Python, OpenSCAD, and Unity to develop a pipeline for generating tubing and visualizing sensor data

PERSONAL AND COURSE PROJECTS – videos and images at https://roccoruan.com/portfolio/

LawnMower – Robotics Engineering Capstone Project **Jan 2023 - Apr 2023**
- In a team of 4, built and programmed a quadcopter drone to perform navigation and mapping tasts

WeeBowling – Microcontrollers Course Project **January 2022 - May 2022**
- Designed and built a wheeled robot controlled through bowling/steering motion from a Wii remote (team of 4)

Cross Control – Video Game Design Course Project **September 2021 – December 2021**
- Developed a 2.5D action/puzzle video game with ability resource bars tied to movement, using C# and Unity
    - Acted as project manager and software developer, with 2 other software devs, 2 musicians, and 3 artists
- Incorporated feedback from 10+ industry game developers and 25+ playtesters across many design iterations
- Presented finished game to representatives from several game studios, including Zynga
- Game, trailer, and developer log available on colleague's website: https://zorgonia.itch.io/crosscontrol

Accent Classification with Machine Learning - AI Course Project **September 2020 – December 2020**
- Worked with 3 colleagues to develop an AI accent classifier using convolutional recurrent neural networks
- Achieved 80-95% holdout accuracy on binary accent classification tasks, improving over SVM baseline

Badminton Shuttle Stacker – Engineering Design Course Project (team of 4) **January 2019 – April 2019**
- Designed a badminton shuttle stacker in consultation with a nationally competitive badminton club

AWARDS AND SCHOLARSHIPS

UBC Four-Year Doctoral Fellowship (**72800 CAD** over 4 years) **Jan 2025 - Dec 2028**
British Columbia Graduate Scholarship (**17500 CAD** over 1 year) **Sep 2024 – Aug 2025**
UBC Computer Science Graduate Teaching Award **July 2024**
Cambridge University Inter-Varsity Debate - 2nd place, novice division **Nov 2020**
NASA Space Apps Hackathon - Canadian Winner **October 2020**

SKILLS & INTERESTS

- **Skills:** Software development (C/C++, C#, Python, Unity, QT, ROS, OpenCV, PyTorch, MATLAB), mechatronics design (CAD, fabrication, circuit design, debugging), robotics (ML, control theory, sensor fusion, localization, computer vision, robot modeling; etc.); human-centred design (engineering and HCI); technical writing/documentation; engineering design process; user research
- **Interests:** martial arts; video games and game design; Ultimate (sport); education; table tennis