UNIVERSITY OF TORONTO
FACULTY OF KINESIOLOGY & PHYSICAL EDUCATION

JOB POSTING – POSTDOCTORAL FELLOW

Area of Research: Human computer interactions, virtual reality, robotics

Description of Duties: The successful candidate will be primarily responsible for coordinating and leading various components of an interdisciplinary research program lead by Drs. Tim Welsh (Faculty of Kinesiology & Physical Education), Ariel Chan (Department of Chemical Engineering & Applied Chemistry), Kourosh Darvish (Acceleration Consortium), Sterling Baird (Acceleration Consortium) and Xiaoye Wang (Faculty of Kinesiology & Physical Education). The project has been funded to investigate how individuals from diverse backgrounds interact with chemistry and chemical process lab devices and tasks in virtual reality (VR) digital twins of a self-driving research laboratory—capturing workflows from bench-scale to pilot-scale.
A key focus is understanding human-computer interaction with digital twins for training purposes in chemistry laboratories, monitoring human motion in digital twin environments, and investigating human-like motion for robotic systems. The successful candidate will be responsible for coordinating and leading the development and testing phases of the primary multi-disciplinary research program. In addition to this main project, the successful candidate will be primarily supervised by Dr. Welsh and also be involved in various additional projects involving motor control and learning in VR.

The ideal candidate will have the following qualifications and skills:

- PhD in computer sciences, engineering, robotics, kinesiology, psychology, or other related field;
- Proficiency in computer programming, robotics, digital twin, and physics-based simulations with IsaacSim, and Unity;
- reinforcement learning and imitation learning for training human-like motions with the robots

The following skills are assets to have:

- Experience with VR (Meta Quest) development, Unity, C#, and HCI research methodologies; experience with chemistry wet lab operations is an asset, but not a requirement;
- Engineering drawing/CAD experience, including AutoCAD, and SolidWorks.
- Strong project management and leadership skills and experience;
- Demonstrated experience and proficiency in writing and publishing scientific manuscripts;
- Strong track record of scholarly research productivity and ability to independently perform research data collection and analysis;
- Exceptional organizational, interpersonal, and communication skills;
- Ability to work independently, while also working well as part of a collaborative team;
- Experience providing mentorship, direction and support to junior researchers/trainees is an asset, but not a requirement.

The successful candidate will coordinate with team members to lead and/or oversee the following:

- Adaptation and refinement of existing digital twin platforms for ethical data collection and analysis (including developing virtual environments, integrating motion tracking, user interaction logging, and privacy protections);
- Conduct studies of human users to collect motion and interaction data during VR-based lab tasks and data;
- Complete a usability and learning evaluation across two VR platforms (Unity and Isaac Sim) and input methods (gesture-based and controller); and
- Creation of digital twin use cases related to chemistry labs and chemical processes

About the University of Toronto and the Faculty of Kinesiology & Physical Education:
The University of Toronto is Canada's largest university, and the only Canadian university to be repeatedly among the top 25 of the Times Higher Education World University Rankings. Situated in one of the world's most diverse cities, The University of Toronto is a global leader in research and teaching. The University of Toronto is also committed to the support and development of postdoctoral research. A centralized postdoctoral office has been created within the School of Graduate Studies to ensure successful training experiences for postdoctoral fellows and resources to prepare for the next step in their careers.

The Faculty of Kinesiology & Physical Education is located at the corner of Spadina Ave. and Harbord St. in downtown Toronto. Dr. Welsh's Action and Attention Lab is within the Warren Stevens Building. The state-of-the-art facility houses cutting-edge laboratory infrastructure to enable behavioural and neurophysiological research on human motor control and learning. Dr. Welsh is part of a collaborative group of Faculty researchers that share resources, lab space and expertise, creating a highly dynamic and enriching environment for graduate and postdoctoral trainees.

Chemical Engineering & Applied Chemistry—one of eight engineering programs in U of T's Faculty of Applied Science & Engineering—has over 500 undergraduate students who use the two-storey, 8,000-square-foot Unit Operations Lab to bridge chemical engineering knowledge with industrial practice. This facility forms the physical foundation of the virtual lab's digital twin in this project.

The Acceleration Consortium (AC) at the University of Toronto is leading a transformative shift in scientific discovery that will accelerate technology development and commercialization. The AC is a global community of academia, industry, and government that leverages the power of artificial intelligence, robotics, materials sciences, and high-throughput chemistry to create self-driving laboratories. These autonomous labs rapidly design materials and molecules needed for a sustainable, healthy, and resilient future, with applications ranging from renewable energy and consumer electronics to drugs. The AI and Automation Lab at the Acceleration Consortium is a research hub to develop AI tools and robotic automation hardware and methods for self-driving labs. The robotics division works on robot manipulation, decision making, experimental planning, and computer vision.

Application instructions: Applicants should submit a CV, recent academic transcript, a cover letter that outlines your research interests, expertise, and suitability for the position, and full contact details for two referees to Dr. Welsh (t.welsh@utoronto.ca). Informal inquiries can also be made to Dr. Welsh at any time.

Closing date: Evaluation of applications will begin on August 9, 2026. Applications submitted after this date will continue to be received and evaluated until a successful candidate is identified.

Expected start date: September 15, 2026, but start date is flexible.

Term: This position is for one year and is potentially renewable based on performance and funding

Location: Warren Stevens Building as well as the AI and Automation Lab of Acceleration Consortium.

FTE: 100%

Salary: $65,000 or greater, commensurate with qualifications. If candidates apply for and are successful with receiving external funding, top-up funding would be considered.

The normal hours of work are 40 hours per week for a full-time postdoctoral fellow (pro-rated for those holding a partial appointment) recognizing that the needs of the employee's research and professional development and the needs of the supervisor's research program may require flexibility in the performance of the employee's duties and hours of work. The successful candidate may have the opportunity to engage in mentoring, teaching and other educational activities.

Employment as a Postdoctoral Fellow at the University of Toronto is covered by the terms of the CUPE 3902 Unit 5 Collective Agreement. This job is posted in accordance with the CUPE 3902 Unit 5 Collective Agreement. The University of Toronto is strongly committed to diversity within its community and especially welcomes applications from racialized persons / persons of colour, women, Indigenous / Aboriginal People of North America, persons with disabilities, LGBTQ2S+ persons, and others who may contribute to the further diversification of ideas.