
Postdoctoral Fellow – Development of BCI-Controlled Exoskeletons

This position is for one year with the possibility of being extended to two years, and offers a benefits package found at [Postdoctoral Fellows Benefits](#).

Location - Work primarily takes place at North Campus Edmonton. This role is in-person.

Working at the University of Alberta

The University of Alberta acknowledges that we are located on Treaty 6 territory, and respects the histories, languages and cultures of First Nations, Métis, Inuit and all First Peoples of Canada, whose presence continues to enrich our vibrant community.

The University of Alberta is a community of knowledge seekers, change makers and world shapers who lead with purpose each and every day. We are home to more than 14,000 faculty and staff, over 40,000 students and 260,000 alumni worldwide.

Your work will have a meaningful influence on a fascinating cross section of people — from our students and community members, to our renowned researchers and innovators, making discoveries and generating solutions that make the world healthier, safer, stronger and more just. [Learn more](#).

Working for the Department

This position will be jointly held between the Neuromuscular Control & Biomechanics Lab (NCB-Lab) and the Imagination Centre Brain-Computer Interface (BCI) Program.

The [NCB-Lab](#) is directed by Dr. Hossein Rouhani in the Mechanical Engineering Department of the University of Alberta. Relying on engineering means and interdisciplinary collaborations, NCB-Lab's team aims to positively impact prevention and rehabilitation by gaining a better understanding of the neuromusculoskeletal mechanisms of human movement, outcome measures for movement and performance assessment, and designing and evaluating advanced assistive technologies with the goal of enhancing the quality of life of those affected by movement impairments.

The [Imagination Centre BCI Program](#) is a clinical and research program directed by Dr. John Andersen and based out of the Glenrose Rehabilitation Hospital. The BCI Program explores solutions to help patients across the lifespan achieve functional goals, increase independence, and enhance participation using BCI technology. The BCI Program is one of very few programs exploring pediatric BCI use globally and is a founding member of BCI-CAN, a coalition of research facilities committed to driving forward pediatric BCI research and innovation.

Position

Qualified applicants are invited to apply for a Postdoctoral Fellow position to design and develop Brain-Computer Interface (BCI)-controlled exoskeletons with cooperative controls for safe interaction with persons with mobility/cognitive impairment. We are currently hiring two postdoctoral fellow positions.

The successful candidate will be working on a large research team with expertise in mechatronics, control engineering, signal processing, deep learning, and pediatric BCI. This is an interdisciplinary and intersectoral research program, involving engineering, medicine, and rehabilitation medicine faculties. Successful candidates will have strong collaboration and coordination skills to work directly with both research teams at multiple levels, rehabilitation centres, and industry partners to contribute to this research project successfully.

The successful candidate will be responsible for mentoring and guiding undergraduate research assistants within the program. The student will receive formal training in the following practical areas:

- i) Biomedical data collection and signal processing
- ii) Machine learning
- iii) Human motion biomechanics
- iv) Development and validation of heuristic healthcare solutions
- v) Equity, Diversity, and Inclusion
- vi) Entrepreneurship
- vii) Safety

Duties

- Guide user-centred design and evaluation of a BCI-controlled upper or lower limb exoskeleton
- Contribute to other research and development projects in both research groups
- Write research grants, scholarship applications, reports, presentations, and manuscripts for publication
- Present at conferences and team meetings
- Train and supervise undergraduate and graduate students
- Foster collaboration and knowledge sharing with partners

Minimum Qualifications

- Completion of a PhD degree in Mechanical Engineering, Electrical Engineering, Biomedical Engineering, or Computer Science
- Keen interest and/or experience in: brain-computer interfaces, systems identification, control engineering, deep learning, and/or biomedical instrumentation and physiological experimentation (e.g., EEG, ECG, EMG)
- Strong publication record in related research areas
- Proven ability to work independently, supervise trainees, and monitor project progress
- Strong communication skills and fluency in spoken and written English

Preferred Qualifications

- Advanced programming skills (Python/C++ and ROS)
- Experience in wearable instrumentation design, bio-mechatronics, collaborative robotics, adaptive control, and SLAM
- Mechatronic systems design experience
- Interest and experience in interdisciplinary and translational research in collaboration with health scientists, healthcare system, and biomedical industry

Application Instructions

Please submit the following online through the [University of Alberta Careers website](#) as .pdf documents:

- Cover Letter
- Curriculum Vitae
- List of Publications
- References
- Transcripts – to be uploaded under “other” and in a single PDF document

At the University of Alberta, we are committed to creating an inclusive and accessible hiring process for all candidates. If you require accommodations to participate in the interview process, please let us know at the time of booking your interview and we will make every effort to accommodate your needs.

All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. If suitable Canadian citizens or permanent residents cannot be found, other individuals will be considered.

We thank all applicants for their interest; however, only those individuals selected for an interview will be contacted.

The University of Alberta is committed to an equitable, diverse, and inclusive workforce. We welcome applications from all qualified persons. We encourage women; First Nations, Métis and Inuit persons; members of visible minority groups; persons with disabilities; persons of any sexual orientation or gender identity and expression; and all those who may contribute to the further diversification of ideas and the University to apply.