# Low mechanical impedance robots - Bridging the gap between AI and hardware

Record number : OPR-1207

## Overview

**RESEARCH DIRECTION**

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**INFORMATION**

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**ADMINISTRATIVE UNIT(S)**

Faculté de génie
Département de génie mécanique
Institut interdisciplinaire d'innovation technologique (3IT)

**LEVEL(S)**

2e cycle
3e cycle
Stage postdoctoral

**LOCATION(S)**

3IT - Institut interdisciplinaire d'innovation technologique

## Project Description

The research project aims to develop intrinsically safe robotic manipulators capable of working in unstructured environments. The short-term objectives include exploring new robotic architectures, developing actuators with nonlinear gear ratios, and improving perception for flexible robots. This project will impact various fields such as healthcare, agriculture, and manufacturing. Ultimately, the goal is to bridge the gap between artificial intelligence and hardware through mechanical intelligence, enabling true embodied AI.

Responsibilities:
- Master's and PhD students: Design of robotic actuators, modeling and control of flexible robots, modeling and control of parallel robots, implementation of sensors in flexible robots.
- Interns: Mechanical and electronic design of test benches and robotic prototypes.

Qualifications:
- Autonomy and excellent communication skills.
- Interest in robotics, mechatronics, and autonomous systems.
- Bachelor's or master's degree in mechanical engineering, electrical engineering, robotics engineering, or a related field.
- Skills in mechanical design, modeling, and simulation (an asset).

Benefits:
- Competitive research scholarships.
- Opportunities for publication and presentation at international conferences.
- Access to prototyping workshops.
- Opportunity to participate in weekly seminars and career development courses.
- Collaborative research environment within the Createk group at the Interdisciplinary Institute for Technological Innovation (3IT).

Commitment to Equity, Diversity, and Inclusion (EDI): We strongly encourage applications from women and international students. Intensive French courses, mentoring programs, and career development opportunities in English are available to facilitate integration.

This project can accommodate one or more students in the following programs:
- Postdoctoral fellowship
- Doctoral thesis
- Research-type master's thesis
- Course-type master's essay
- 3rd cycle research internship
- 2nd cycle research internship
- Undergraduate research internship

## Discipline(s) by sector

### Sciences naturelles et génie

Génie mécanique

## Funding offered

Yes

The last update was on 22 June 2026. The University reserves the right to modify its projects without notice.