Advanced Machine Learning in MEMS

Record number : OPR-758

Overview

RESEARCH DIRECTION

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INFORMATION

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ADMINISTRATIVE UNIT(S)

Faculté de génie
Département de génie électrique et de génie informatique
Département de génie mécanique

LEVEL(S)

2e cycle
3e cycle

LOCATION(S)

3IT - Institut interdisciplinaire d'innovation technologique

Project Description

Microelectromechanical systems (MEMS) implement actuator and sensor functions in a wide variety of applications. Our research group is the inventor and leader in the development of a completely new class of MEMS devices that combine the functions of sensing and neuromorphic computing (aka. machine learning or artificial intelligence). Our technology harnesses the non-linearity of mechanical structures in the MEMS sensors to implement sophisticated learning capabilities. One of its most important advantages is its suitability for building smart systems that are extremely small and energy efficient.

Many different research projects are available for the development of our MEMS technology and for its demonstration in state-of-the-art applications, such as wearable devices for gait retraining for people with knee arthritis, the control of robots and small drones, as well as the detection of mechanical failures in autonomous vehicles.

Thesis projects can be defined to meet the specific training objectives of each graduate student, with elements of microfabrication, design and test of MEMS, embedded electronics, advanced computing (including neural networks), biomechanics, robotics, etc.

This project can accommodate one or more students in the following programs:
- Research-type master's thesis
- Doctoral thesis

Discipline(s) by sector

Sciences naturelles et génie

Génie électrique et génie électronique,
Génie mécanique

Funding offered

Yes

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