PDF-Artificial Intelligence and Software Systems for Breast Imaging

Record number : OPR-1454

Overview

RESEARCH DIRECTION

Jean-Baptiste Michaud, Professeur - Department of Electrical and Computer Engineering

INFORMATION

jean-baptiste.michaud@usherbrooke.ca

ADMINISTRATIVE UNIT(S)

Faculté de génie
Département de génie électrique et de génie informatique

LEVEL(S)

Stage postdoctoral

LOCATION(S)

Centre de recherche du CRCHUS
Campus de Sherbrooke

Project Description

Context
Breast cancer is the most commonly diagnosed cancer among women worldwide, with approximately 2.3 million new cases each year. While early detection remains the most effective way to improve survival rates, current screening methods still face significant challenges related to cost, accessibility, and patient comfort.
BRAVE (BRA-based ViscoElastography) is an innovative technology developed at the University of Sherbrooke that generates three-dimensional breast stiffness maps using a conventional bra and an optical imaging system. This approach is non-invasive, free of ionizing radiation, does not require breast compression, and eliminates direct contact with the patient.

Research project
The research team led by Prof. Jean-Baptiste Michaud, in collaboration with Prof. Elijah Van Houten and Prof. Valérie Grandbois, has secured technology maturation funding to advance the BRAVE prototype toward a robust, scalable, and industry-ready software platform for clinical translation and future commercialization.
This initiative aims to modernize the platform's software architecture, incorporate advanced artificial intelligence methodologies, and ensure compliance with the regulatory and quality requirements governing medical device technologies.

Proposed activities
• Plan and implement the software platform maturation strategy.
• Modernize and evolve the software architecture toward a distributed, modular infrastructure based on agents and microservices.
• Deploy the tools and processes required for software lifecycle management, including version control, quality assurance, automated testing, and issue tracking.
• Develop and integrate advanced computer vision, artificial intelligence, and data analytics algorithms.
• Design and implement tools for system performance evaluation, optimization, and validation.
• Integrate data management, metadata management, and access control infrastructures.
• Contribute to the design and enhancement of user interfaces in collaboration with research teams and end users.
• Manage, generate, and validate datasets used for the training and evaluation of artificial intelligence models.
• Support clinical studies and contribute to research, innovation, and technology transfer activities.

• Perform other related duties in support of the project's objectives and activities.

Supervision and research environment
The project will be carried out at the Université de Sherbrooke under the supervision of Prof. Jean-Baptiste Michaud, in collaboration with Prof. Elijah Van Houten and Prof. Valérie Grandbois. The selected candidate will join a multidisciplinary team spanning the Faculty of Engineering and the Centre de recherche du CHUS (CRCHUS), bringing together expertise in software engineering, artificial intelligence, biomechanics, medical imaging, and technological innovation.

Candidate profile
• PhD in Software Engineering, Computer Science, Computer Engineering, Artificial Intelligence, or a related field.
• Strong interest in medical technologies, artificial intelligence, data processing, and applied research environments.
• Experience in software architecture and the development of complex software systems.
• Knowledge of software lifecycle management practices.
• Excellent written and verbal communication skills in either French or English.
• Demonstrated ability to work independently, apply scientific rigor, and collaborate effectively within a multidisciplinary team.
• Assets: Experience working in regulated environments or in the development of software solutions for healthcare and medical device applications.

Application
Please submit a cover letter, curriculum vitae (CV), and the contact information of two references to Jean-Baptiste.Michaud@USherbrooke.ca.
Subject line: Application – BRAVE Postdoctoral Fellowship
Duration: 2 years.

Discipline(s) by sector

Sciences naturelles et génie

Génie informatique et génie logiciel

Funding offered

To be discussed

Partner(s)

Centre de recherche du CHUS - CRCHUS

The last update was on 19 October 2026. The University reserves the right to modify its projects without notice.