Canadian Institutes of Health Research | Instituts de recherche en santé du Canada
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Canada

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Template: CGS-Master's

Ms. Jacynthe Francoeur

Correspondence language: French
Sex: Female
Date of Birth: 6/16
Canadian Residency Status: Canadian Citizen
Country of Citizenship: Canada

Contact Information

The primary information is denoted by (*)

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Canada

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Ms. Jacynthe Francoeur

Language Skills

Language	Read	Write	Speak	Understand
English	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes

User Profile

Research Disciplines: Biomedical Engineering and Biochemical Engineering, Physical Engineering

Areas of Research: Optics and Photonics, Prototyping, Instruments

Fields of Application: Foundations and Knowledge Acquisition, Pathogenesis and Treatment of Diseases

Research Specialization Keywords: Backscattering, Fiber Bragg gratings, Fiber optics, Multimodal detection

Degrees

2021/5 (2023/12) — Master's Thesis, Master of Science (MSc), Biomedical Engineering, École Polytechnique de Montréal
Degree Status: In Progress

Supervisors: Kadoury, Samuel; Kashyap, Raman

2017/8 - 2021/5 — Bachelor's, Bachelor of Engineering (BEng), Biomedical Engineering, École Polytechnique de Montréal
Degree Status: Completed

Recognitions

2017/8 - 2018/5 — Admission scholarship for academic excellence - 2,000 (Canadian dollar)
École Polytechnique de Montréal
Prize / Award

Employment

2020/1 — Biomedical Engineering Program student representative at the university's open house day
Biomedical Engineering, École Polytechnique de Montréal

2019/11 — Biomedical Engineering Program student representative at the university's open house day
Biomedical Engineering, École Polytechnique de Montréal

2023/1 - 2023/5	Visiting scholar - Design of an optical fiber-based shape sensing needle with embedded fiber Bragg grating strain sensors for minimally invasive surgical procedures Robotics, Whiting School of Engineering, Johns Hopkins University
2020/10 - 2021/5	UPIR research intern - Ergodic ultrasound probe design for pixel decoding based on fewer reception channels Department of Engineering Physics, École Polytechnique de Montréal
2020/5 - 2020/8	USRA research intern - Ergodic ultrasound probe design for pixel decoding based on fewer reception channels Department of Engineering Physics, École Polytechnique de Montréal
2020/6 - 2020/7	Course preparation student - Design of a tactile surface using a piezoelectric sensor Department of Engineering Physics, École Polytechnique de Montréal
2019/10 - 2020/5	UPIR research intern - Construction of a pulsatile flow phantom for optimization of pulsatility mapping by dynamic ultrasonic location microscopy Department of Engineering Physics, École Polytechnique de Montréal
2019/5 - 2019/8	USRA research intern - Functionalized plasmonic nanoprobes design for immunolabeling diagnosis Department of Engineering Physics, École Polytechnique de Montréal
2018/10 - 2019/5	UPIR research intern - Supervised classification algorithm design to understand the evolution of the employment relationship in the 21st century Department of Mathematical and Industrial Engineering, École Polytechnique de Montréal

Leaves of Absence and Impact on Research

2020/5 - 2020/8	Other Circumstances, Mitacs In winter 2020, I was accepted into the competitive Globalink-RISE research internship program offered by Mitacs in partnership with the German Academic Exchange Service (DAAD). I was very excited to travel to Germany in summer2020 to participate in a research project at the Berlin Center for Advanced Neuroimaging at Charité University, one of Germany's leading biomedical research institutions. Much to my dismay, the internship, which was an opportunity for me to have a rewarding experience relevant to my professional growth, was cancelled due to the COVID-19 pandemic.

Research Funding History

Awarded [n=1]

2020/5 - 2020/8
Principal Applicant

Building volume conductor models of individual heads to improve the analysis of brain activity in large EEG/MEG datasets - CANCELLED DUE TO COVID-19

Principal Investigator : Pellegrini, Franziska

Funding Sources:

2020/5 - 2020/8 Mathematics of Information Technology and Complex Systems (MITACS)
RISE-Globalink Research Internship
Total Funding - 6,000 (Canadian dollar)
Funding Competitive?: Yes

Completed [n=6]

2022/5 - 2023/5
Principal Applicant

Design of an intravascular guidewire device integrating random Bragg gratings optical fibers for multimodal detection during peripheral vascular procedures

Funding Sources:

2022/5 - 2023/5	Natural Sciences and Engineering Research Council of Canada (NSERC) Canada Graduate Scholarships – Master's program Total Funding - 17,500 (Canadian dollar) Funding Competitive?: Yes
2022/5 - 2023/5	Fonds de recherche du Québec - Nature et technologies (FRQNT) Master's (B1X) Research Scholarships Total Funding - 17,500 (Canadian dollar) Funding Competitive?: Yes

2023/1 - 2023/5
Principal Applicant

Design of an optical fiber-based shape sensing needle with embedded fiber Bragg grating strain sensors for minimally invasive surgical procedures

Co-director : Iulian Iordachita; Samuel Kadoury

Funding Sources:

2023/1 - 2023/5	Natural Sciences and Engineering Research Council of Canada (NSERC) Canada Graduate Scholarships – Michael Smith Foreign Study Supplements Total Funding - 6,000 (Canadian dollar) Funding Competitive?: Yes
2023/1 - 2023/4	Fayolle Canada United-States' Prestige Total Funding - 10,000 (Canadian dollar) Funding Competitive?: Yes

2020/5 - 2021/5
Principal Applicant

Ergodic ultrasound probe design for pixel decoding based on fewer reception channels

Principal Investigator : Provost, Jean

Funding Sources:

2020/10 - 2021/5	École Polytechnique de Montréal UPIR - Participation and Research Introductory Unit Scholarships Total Funding - 1,500 (Canadian dollar) Funding Competitive?: Yes
2020/5 - 2020/8	Fonds de recherche du Québec - Nature et technologies (FRQNT) Supplements of the NSERC Undergraduate Student Research Awards - USRA (BPCA) Total Funding - 1,500 (Canadian dollar) Funding Competitive?: No
2020/5 - 2020/8	Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Student Research Awards - USRA (BPCA) Total Funding - 4,500 (Canadian dollar) Funding Competitive?: Yes

2019/10 - 2020/5
Principal Applicant

Construction of a pulsatile flow phantom for optimization of pulsatility mapping by dynamic ultrasonic location microscopy

Principal Investigator : Provost, Jean

Funding Sources:

2019/10 - 2020/5 École Polytechnique de Montréal
UPIR - Participation and Research Introductory Unit Scholarships
Total Funding - 1,500 (Canadian dollar)
Funding Competitive?: Yes

2019/5 - 2019/8
Principal Applicant

Functionalized plasmonic nanoprobes design for immunolabeling diagnosis

Principal Investigator : Meunier, Michel

Funding Sources:

2019/5 - 2019/8 Fonds de recherche du Québec - Nature et technologies (FRQNT)
Supplements of the NSERC Undergraduate Student Research Awards - USRA (BPCA)
Total Funding - 2,000 (Canadian dollar)
Funding Competitive?: No

2019/5 - 2019/8 Natural Sciences and Engineering Research Council of Canada (NSERC)
Undergraduate Student Research Awards - USRA (BPCA)
Total Funding - 4,500 (Canadian dollar)
Funding Competitive?: Yes

2018/10 - 2019/5
Principal Applicant

Supervised classification algorithm design to understand the evolution of the employment relationship in the 21st century

Principal Investigator : Berkelaar, Brenda

Funding Sources:

2018/10 - 2019/5 École Polytechnique de Montréal
UPIR - Participation and Research Introductory Unit Scholarships
Total Funding - 1,500 (Canadian dollar)
Funding Competitive?: Yes

Editorial Activities

2020/6 - 2020/7 Course preparation student, Localization of finger impacts on a surface using an acoustic time-reversal method, Report
I participated in the development of an academic project for the 3rd year course PHS3910 - Engineering Physics Experimental Techniques and Instrumentation for the Fall 2020 semester. I helped write a clear project statement and relevant report questions.

Community and Volunteer Activities

2022/10 Optica-SPIE student committee volunteer, École Polytechnique de Montréal
I volunteered to ensure the smooth running of the event (Innovation Day).

2022/6 Optica-SPIE student committee representative, Festival Eurêka!
I hosted the Optica-SPIE student committee's science booth for children.

2020/1 - 2020/1 Biomedical Engineering Program student representative, École Polytechnique de Montréal
I attended the school's winter open house as a student representative of the biomedical engineering program to present the program and answer questions from visitors.

2019/11 - 2019/11	Biomedical Engineering Program student representative, École Polytechnique de Montréal I attended the school's fall open house as a student representative of the biomedical engineering program to present the program and answer questions from visitors.
2017/6 - 2018/9	Recreation staff, Centre des loisirs de Beloeil During summer, I participated in the organization and running of several community events organized by the Centre des loisirs de Beloeil, namely the Festival Kaput, the Beloeil Summer Festival, family events, neighbourhood events and family outdoor movie nights.
2015/5 - 2017/2	Employee at Le Monde des Poilus, Minou Cherche Maison I participated in more than one stray cat adoption day organized by Minou Cherche Maison at Le Monde des Poilus.
2014/9 - 2015/6	International solidarity committee member, École d'éducation internationale de McMasterville This committee organized activities to raise awareness to international solidarity among the school's students.
2012/9 - 2015/6	Member, then head of the host and hostess committee, École d'éducation internationale de McMasterville The role of this student committee was to participate in the many events, both academic and non-academic, that took place at the school in order to ensure their smooth running.

International Collaboration Activities

2023/1 - 2023/5	Visiting scholar, United States of America In a collaboration between Polytechnique Montréal and Johns Hopkins University, I traveled to Johns Hopkins to embed a flexible needle, used in minimally invasive prostate interventions, with a fiber optic shape sensor developed in our Montreal lab, using distributed light backscatter measurements. The primary goal was to compare our sensor's performance with their custom Fiber Bragg Grating (FBG)-based sensor. Insights from this project were compiled into a paper that was submitted to ICRA 2024.
2021/5 - 2022/2	Research and development, United States of America In this collaboration with Boston Scientific, I worked on software development for real-time 3D shape reconstruction of an optical fiber triplet from measurements obtained by optical frequency domain reflectometry (OFDR).

Other Memberships

2021/11 - 2022/11	Treasurer and member in charge of communications, Optica-SPIE Student Chapter This student committee represents Optica and the Society of Photo-Optical Instrumentation Engineers (SPIE), two international optical societies, at Polytechnique Montreal. Its mission is to promote, vulgarize and make optics more accessible at various levels through various educational and networking activities inside and outside the school environment.

Presentations

1. (2022). Real-time 3D Shape Sensing with a Random Fiber Bragg Grating Triplet. COPL Annual Day, Montréal, Canada
   Main Audience: Researcher
   Invited?: No, Keynote?: No, Competitive?: No

2. (2022). Real-time 3D Shape Sensing with a Random Fiber Bragg Grating Triplet. Optical Sensors 2022, Vancouver, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No, Competitive?: Yes

Publications

Journal Articles

1. Francoeur, J*; Roberge, A*; Lorre, P*; Monet, F*; Wright, C; Kadoury, S; Kashyap, R. (2023). Optical frequency domain reflectometry shapesensing using an extruded optical fiber tripletfor intra-arterial guidance. Optics Express. 31(1): 396-410.
First Listed Author
Published
Refereed?: Yes
Number of Contributors: 6

   Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC)

Reports

1. First Listed Author. Francoeur, J*. (2022). Real-time shape reconstruction with ROGUE triplets. 26. École Polytechnique de Montréal
Synthesis?: Yes
Number of Contributors: 3

   Funding Sources: Boston Scientific Corp.

2. First Listed Author. Francoeur, J*. (2019). Gold nanostars assisted picosecond laser optoporation for gene delivery - Final report (Summer 2019 LP2L intership). 3. École Polytechnique de Montréal
Synthesis?: Yes
Number of Contributors: 2

   Funding Sources: Fonds de recherche du Québec - Nature et technologies (FRQNT); Natural Sciences and Engineering Research Council of Canada (NSERC)

Conference Publications

1. Francoeur, J*; Lezcano, D*; Zhetpissov, Y*; Kashyap, R; Iordachita, I; Kadoury, S. (2023). Fully Distributed Shape Sensing of a Flexible Surgical Needle Using Optical Frequency Domain Reflectometry for Prostate Interventions. IEEE International Conference on Robotics and Automation (ICRA). 2024 IEEE International Conference on Robotics and Automation (ICRA2024)
Conference Date: 2024/5
Paper
First Listed Author
Submitted
Refereed?: Yes, Invited?: No
Number of Contributors: 6

   Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC); Fayolle Canada

2. Francoeur, J*; Roberge, A*; Lorre, P*; Monet, F*; Wright, C; Kadoury, S; Kashyap, R. (2022). Real-time 3D Shape Sensing with a Random Fiber BraggGrating Triplet. Optical Sensors and Sensing Congress 2022. Optical Sensors 2022
Conference Date: 2022/7
Abstract
First Listed Author
Published
Refereed?: Yes, Invited?: No
Number of Contributors: 7