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Canada Research Chair in Smart Biomedical Microsystems
Director, Smart Biomedical Microsystems Laboratory
Chapter Chair, IEEE Quebec EMBS/CASS
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Experience

- Chair holder, Canada Research Chair in Smart Biomedical Microsystems (2018-)
- Full Professor, Department of Electrical Engineering and Computer Engineering, Université Laval (2019-)
- Associate Professor, Department of Electrical Engineering and Computer Engineering, Université Laval (2015-2019)
- Assistant Professor, Department of Electrical Engineering and Computer Engineering, Université Laval (2010-2015)
- Postdoctoral Fellow, Georgia Institute of Technology (2010-2011)
- Integrated circuit designer, PMC-Sierra, Montreal (2009-2010)
- Lecturer, École Polytechnique de Montréal (2007-2009)
- Research assistant, École Polytechnique de Montréal (2001-2009)

Education

- B. Sc. in electrical engineering, École Polytechnique de Montréal, 2001.
- M.Sc. in Electrical Engineering, École Polytechnique de Montréal, 2004.
- Ph.D. in electrical engineering, École Polytechnique de Montréal, 2009.

Expertise

- Biomedical engineering
- CMOS integrated circuits design
- Biomedical instrumentation and bioelectronics
- Wireless microsensors design
- Analog, digital and mixed microelectronics
- RF integrated circuit design
- Portable and implantable electronic systems

Director, Smart Biomedical Microsystems Laboratory, January 2011 –

The laboratory relies on a microsystem integration platform and test infrastructure unique in

Canada and funded several times by the Canada Foundation for Innovation and the Natural Sciences and Engineering Research Council of Canada. The laboratory currently includes:

- 25 graduate students
- 4 postdoctoral fellows
- 1 research engineer

Selected Honors and Awards

- Fellow of the Canadian Academy of Engineering (2020)
- Finalist for the RSRI Prize of the ADRIQ-RTCi (2020)
- Tribute to inspiring personalities, Summa Awards Ceremony, Faculty of Science and Engineering, Laval University (2019)
- Engineering Innovation Award 2019, Order of Engineers of Quebec (2019)
- Holder of the Canada Research Chair in Smart Biomedical Microsystems (2018)
- NSERC Brockhouse Canada Prize for Interdisciplinary Research in Science and Engineering (2018)
- Best Paper and Best Poster Awards at the IEEE Life Sciences Conference 2018
- Best Paper Award at the IEEE NEWCAS Conference 2018
- Best Paper Award at the IEEE Intl. Conference on Systems, man and cybernetics 2017
- Best Live Demo Award at the IEEE Intl. Symposium on Circuits and Systems 2017
- Best New Chapter Award, IEEE EMBS Quebec Chapter
- Mitacs Award for Outstanding Innovation - Master's
- Best Paper Award at the IEEE BioCAS Conference 2017
- Best Student Poster Award at the MEDTEQ Forum, Quebec City
- Finalist for the Best Student Paper Award at the IEEE BioCAS Conference 2014
- Best Student Paper Award at the IEEE NEWCAS Conference 2014

Editing

- **Associate Editor**, IEEE Transactions on Biomedical Circuits and Systems (2015-)
- **Guest Editor**, IEEE Transactions on Biomedical Circuits and Systems, Special issue on IEEE BioCAS 2019 (2020)
- **Guest Editor**, IEEE Transactions on Circuits and Systems I: Regular Papers, Special issue on IEEE NEWCAS 2019 (2020)
- **Guest Editor**, Frontiers in Digital health, Wearable Point-of-Care Diagnostics and Health Monitoring Devices (2020)
- **Guest Editor**, Sensors, Basel. Special issue on Wearable Biomedical Sensors (2020)
- **Guest Editor**, Sensors, Basel. Special issue Wearable Wireless Sensors, Sensors (2018)

Graduate and Research Staff Supervision

- PhD **26**
- MSc **34**
- Research Assistants **4**
- Postdoctoral Fellows **6**
- Undergraduate interns **43**

External Representation and Leadership

Committee Memberships

- Member, Center for Optics, Photonics and Lasers (2020-)
- Member, CERVO Brain Research Center (2015-)
- Member, Center for Interdisciplinary Res. in Rehabilitation and Social Integration (2015-)
- **Member Representative**, CMC Microsystems (2019-)
- **Member of the Executive Council** of Microsystems Strategic Alliance of Québec (www.resmiq.org) (2012-)
- **Member of the Board of Directors**, ReSMiQ (2012-2015)
- Member, Ordre des Ingénieurs du Québec
- **Founder and Chair** of the IEEE CAS/EMB Society Quebec Chapter (2014-)
- Member of the technical committee, IEEE Biomedical and Life Science Circuits and Systems (2015-)
- NSERC Discovery Grant Review Panel (Electrical Eng.) (2012-)
- Team Research Project Program Review Panel (Electrical Eng.) (2013-)
- Member, NSERC Research Tools and Instruments Selection Committee (2018-)
- Graduate Program Committee Member, Depart. of electrical and computer eng. (2017-)
- Member of the Student Investment Committee, Depart. of electrical and computer eng. (2017-)

Organization of Intl. Conferences (selected)

- **General Chair**, IEEE NEWCAS Conference, 2022, Quebec City, Canada.
- **Technical Program Co-chair**, IEEE NEWCAS Conference, Toulon, France, June 13-16, 2021.
- **Technical Program Chair**, IEEE Engineering in Medicine and Biology 2020, Montreal, Canada, July 20-24, 2020.
- **Technical Program Chair**, 2019 IEEE NEWCAS Conference, June 23-26, 2019.
- Regular Session Chair, C6L-I, Wearable Sensors, Circuits and Systems, IEEE ISCAS'19 Conference, Sapporo, Japan, May 23-27, 2019.
- **Technical Program Chair**, IEEE Life Science Conf., Montreal, Canada, Oct. 28-30, 2018.
- Special Session Organizer and Chair, "EMG Sensing & Signal Processing," the IEEE Life Sciences Conference, Montreal, October 28-30, 2018.
- Special Session Organizer and Chair, "Sensors & Actuators for Animal Models," the IEEE Life Sciences Conference, Montreal, October 28-30, 2018.
- Member of the Technical Program Committee, IEEE BioCAS'18 Conference, Cleveland, USA, Oct. 17-19, 2018.
- Regular Session Chair, A5L-B, Biomedical Circuits and Systems, IEEE NEWCAS'18 Conference, Montreal, Canada, June 24-27, 2018.
- Regular Session Chair, C3L-A, Digital Signal Processing 2: Life Sciences Applications, IEEE NEWCAS'18 Conference, Montreal, Canada, June 24-27, 2018.
- Regular Session Chair, C1L-A, Digital Signal Processing 1: Telecommunications and Power Systems, IEEE NEWCAS'18 Conference, Montreal, Canada, June 24-27, 2018.
- Member of the technical program committee, IEEE International NEWCAS Conference Montreal, Québec, Canada, June 24 to 27, 2018.
- **Publications Co-chair**, 31st Annual IEEE Canadian Conference on Electrical and Computer

Engineering (CCECE 2018), Québec City, Canada on May 13–16, 2018.

- Member of the Technical Program Committee, **Analog circuits and systems Track Chair**, IEEE MWSCAS'17 Conference, Boston, USA, August 6-9, 2017.
- **Special session Co-chair**, IEEE NEWCAS'17, Strasbourg, France, June 2016.
- **Young Professional Special Session Co-Chair**, IEEE ISCAS'16 Conference, Montreal, Canada, May 22-25, 2016.
- **Tutorial co-chair**, IEEE NEWCAS'16, Vancouver, British Columbia, June 26-29, 2016.
- **Publicity/Exhibitors/Patron Co-Chair**, IEEE BIOCAS'15 Conference, Atlanta, USA, October, 22-24, 2015.
- **Tutorial co-chair**, IEEE NEWCAS'14, Trois-Rivières, Québec, June 22-25, 2014

Publications¹

• Peer-reviewed journal papers	54	
• Peer-reviewed conference papers	118	(31 invited)
• Keynotes and Invited talks	53	
• Book chapters	5	
• Guest editor (journals)	5	
• Patents	7	

Media Attention

Broadcast Interviews

- Smart hand prosthesis and wearable electronic sensors, Capsules Scientifique de nature, ICI Explora (2018), <https://ici.exploratv.ca/videos/2289-lintelligence-de-mains-robotisees/>
- Interfaces cerveau-machine, Catherine Lachaussee, Radio-Canada cet après-midi, Radio-Canada (2017)

Text Interviews

- Émilie Pelletier, "A bracelet against COVID-19 designed in part at Université Laval", Le Soleil, 4 octobre 2020.
- Valérie Levée, "Prix Génie Innovation 2019 : Le génie électrique pour scruter le cerveau", Revue Plan, Septembre-octobre 2019.
- Jean Hamann, "Le timbre de la respiration", Le Fil, avril 2019.
- Mélissa Guillemette, "Des puces pour le cerveau faites à Québec", Québec science, Nov. 2016.
- "Optogenetics device shines a new light on brain function", Success Stories 2015-16, CMC Microsystems. [Online]. Available: <http://www.cmc.ca/AboutCMC/SuccessStories.aspx>
- Jean Hamann, "Étudier le cerveau en mode Bluetooth", Le Fil, novembre 2015.
- "Multicoil Links May Hold the Key to Wireless Charging", Innovation Spotlight - IEEE Xplore, juin 2015. [Online]. Available: <https://innovate.ieee.org/innovation-spotlight/multicoil-links-may-hold-the-key-to-wireless-charging/>
- Jean Hamann, "Des vêtements sans fil", Le Fil, décembre 2014.
- Jonathan Baronet, "Des champs magnétiques à la place des fils?", Impact Campus, avril 2014.

¹ Complete publications list : <https://scholar.google.ca/citations?user=1lGeIqYAAAAJ&hl=en>

Selected Research Grants

- “Canada Research Chair in Smart Biomedical Microsystems”, NSERC Canada Research Chair Tier 2, \$500,000, 2018-2023.
- “2018 Brockhouse Canada Prize for Interdisciplinary Research in Science and Engineering,” NSERC, Principal Applicant: Yves De Koninck, Co-applicants : Benoit Gosselin, Daniel Côté, Michel Piché, Réal Vallé, Younès Messaddeq, \$250,000.
- “Smart neuroscience platform enhancement and pilot data on using KCC2 as a new target for Alzheimer's disease”, Weston Brain Institute, Co-applicants: Y. De Koninck, M. Mohajerani \$981,050, 2020-2023.
- “Smart EO platform for closed-loop neural control in free-moving animals”, FRQNT Team Grant, \$150,000, Co-applicants: Christian Éthier; Christophe Proulx, Benoit Labonté, 2020-2023.
- “Smart bioelectronic microsystems manufacturing and multi-technology integration facility,” John Evans CFI, \$250,000, 2018-2023.
- “Smart, Autonomous, Adaptive Sensing”, NSERC CREATE Program, Principal Appl.: D. Côté, Co-appl. : A. Marette, M. Babin, M. Hébert, P. Marquet, R. Vallée, S. Thibault, T. Galstian, W. Vincent, Y. De Koninck, \$1,350,000, 2017-2023.
- “A multimodal seizure detection artificial intelligence-based smart wear,” NSERC/CIHR Collaborative Health Research Projects, Principal Applicant: Dang Nguyen, Co-applicant: Benoit Gosselin, Mohamad Sawan, \$950,000, 2018-2021.
- “Smart multimodal neuroscience platform for enabling behavioural experiments with untethered animals,” NSERC Discovery Grant, \$175,000, 2016 – 2021.
- “Plateforme neuro-optoélectronique sans fil rechargeable pour le développement de traitements efficaces contre les troubles de l’humeur”, Sentinel North Strategy, Canada First Research Excellence Fund, Principal Applicant, \$85,000, 2019-2020.
- “Innovative systems for smart multimodal optoelectronic sensors integration”, NSERC Research tools and instruments, Co-applicant: Yves De Koninck, 2018-2020, \$150,000.
- "Interface optoélectronique sans fil auto-rechargeable pour l'étude en continu du cerveau de petits animaux pendant le comportement," Co-applicants: Christian Éthier; Igor Timofeev, \$222,000, 2017-2020.
- “Versatile Systems-on-Chip Integration to Reduce Aircraft Weight and Gas Emission”, NSERC Collaborative Research and Development Grants, Principal Appl.: M. Sawan, Co-appl.: B. Gosselin, A. Lakhssassi; Y. Savaria, \$996,000, 2019-2022.
- “Microsystems Strategic Alliance of Quebec (ReSMiQ),” FRQNT Strategic Cluster, Principal Appl.: M. Sawan, Co-applicants: B. Gosselin, etc., \$2,595,000, 2015-2021.
- “Minimally-invasive, wireless, multimodal micro-optrodes for brain sensing”, Nominated Principal Applicant: Y. Messaddeq, Co-Applicants: B. Gosselin and Y. De Koninck, CIHR-CHRP (NSERC Partnered), \$750,000, 2015-2018.
- “Electronic/photonic microsystems for next generation high capacity communications”, Principal Applicant: S. LaRoche, Co-applicants: B. Gosselin, J. Azana, LA Rusch, M” Sawan, W. Shi, Y. Messaddeq, Y. Savaria, CFI Innovation Fund, \$1,700,610, 2015-2019.
- “A wireless multimodal body-machine interface for smart assistive robotics,” NSERC Collaborative Research and Development Grants and Prompt Québec, Co-applicants: Alexandre Campeau Lecours, Clément Gosselin, \$60,000, 2017-2018.
- “A smart multimodal neuroscience platform for enabling new drugs and innovative therapeutics against neurodegenerative diseases,” W. Garfield Weston Foundation, Rapid response, Co-applicant: Yves De Koninck, Collaborator : Younès Messaddeq, \$150,000, 2016-2017.