Sreeraman Rajan

CONTACT INFORMATION

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EDUCATION

Ph.D., Electrical and Computer Engineering, *2004*
University of New Brunswick, Fredericton, New Brunswick, Canada

M.Sc., Electrical Engineering, *1992*
Tulane University, New Orleans, Louisiana, U.S.A

Orientation Training, Nuclear Science and Engineering, *1987*
Training School, Bhabha Atomic Research Center, Mumbai, Maharashtra, India

B.E, Electronics and Communication Engineering, *1986*
Bharathiyar University, Coimbatore, TamilNadu, India

ACADEMIC EMPLOYMENT

Associate Professor, Tier 2 Canada Research Chair *July 2015 – Present*
Department of Systems and Computer Engineering,
Carleton University, Ottawa, Ontario, Canada
- Digital Signal Processing teaching and research in the areas of contact/noncontact sensor signal processing, data analytics, compressive sensing and machine learning

Adjunct Assistant Professor *April 2015 – April 2021*
Department of Electrical Engineering and Computer Engineering,
The Royal Military College, Kingston, Ontario, Canada
- Research in various aspects of signal processing for electronic warfare and electronic warfare systems

Adjunct Professor *April 2010 – 2018*
School of Electrical Engineering and Computer Science,
University of Ottawa, Ottawa, Ontario, Canada
- Research in the area of physiological signal processing, design of instrumentation and signal processing for non-invasive medical devices, stand-off detection

Research Assistant *Sept. 1995 to Aug. 1999*
Department of Electrical and Computer Engineering,
University of New Brunswick, Fredericton, New Brunswick, Canada
- Conducted research and analysis in the areas of signal processing, pattern classification and neural networks

Research Assistant *Sept. 1992 to Aug. 1995*
Department of Electrical and Computer Engineering,
University of Colorado at Denver, Denver, Colorado, U.S.A.
- Conducted research and analysis on adaptive filtering and two-dimensional signal processing

Research Assistant *Sept. 1990 to May 1992*
Department of Electrical Engineering,
Tulane University, New Orleans, Louisiana, U.S.A
- Conducted research and analysis on adaptive filtering

Industry Experience

Defence Scientist *December 2004 – June 2015*
Defence Research & Development Canada, Ottawa, Ontario, Canada

- Research in areas of Communication and Radar Electronic Warfare.

Signal Processing Specialist *August 2003 – December 2004*
Biopeak Corporation, Ottawa, Ontario, Canada

- Research and development in non-invasive medical devices for physiological signal monitoring

DSP Algorithm Specialist/Optics Engineer *September 2000 – May 2003*
Ceyba Corp, Ottawa, Ontario, Canada

- Research and development in ultra long haul and long haul fiber optical communication systems

Module Algorithm Specialist *September 1999 – August 2000*
JDS Uniphase, Ottawa, Ontario, Canada

- Research and development of algorithms for modules and testing of optical switches

Visiting Research Associate *August 1997 to April 1998*
Siemens Corporate Research, Princeton, New Jersey, U.S.A

- Member of the "Tricorder Project" team. Researched and developed a heart murmur detection system using electronic stethescope

Scientific Officer *August 1987 – August 1990*
Reactor Control Division,
Bhabha Atomic Research Center, Mumbai, Maharashtra, India

- Researched and designed computer based systems for control, protection and regulation systems for nuclear research and power reactors.

Teaching Experience

Instructor *May 2017*
Carleton Mini Enrichment Program,
Carleton University, Ottawa, Ontario, Canada

- Fast Math for High School Students

Associate Professor *July 2015 - Present*
Department of System and Computer Engineering,
Carleton University, Ottawa, Ontario, Canada

- SYSC 4405 Digital Signal Processing (4 offerings as Instructor) Winter 2016,2017, Fall 2016,2017,2020
- SYSC 5602 Digital Signal Processing (2 offerings as Instructor) Fall 2017, Fall 2018, Winter 2020
- SYSC 3203 Bioelectrical Systems (1 offering as Instructor) Fall 2018

Instructor – Vedic Mathematics *Fall 2010, Spring 2011*
Ottawa Chapter of Association of Bright Children of Ontario, Ottawa,Ontario, Canada

- Instructed elementary and high school students in Vedic Mathematics.
- Developed course material for Vedic Mathematics

Teaching Experience (cont.)

Teaching Assistant – Electrical and Computer Engineering *1995–1998*
University of New Brunswick, Fredericton, New Brunswick, Canada

- Teaching assistant for two senior-level undergraduate electrical engineering courses: *ECE 4531 Digital Signal Processing I* and *ECE 4542 Digital Signal Processing II.*
- Co-delivered the graduate-level course: *EE 6513 Introduction to Random variables and Stochastic Processes* with Prof. R. Doraiswami in Fall 1997
- Supervised weekly two lab sessions for EE 3511 Signals Lab in Fall 1996, 1997
- Supervised weekly two lab sessions for ECE 1817 Electricity and Magnetism Lab in Fall 1995, 1996).
- Responsible for grading the quizzes, midterm, and lab reports.
- Responsible for guiding undergraduate students in their thesis projects.

Facilitator *1993 – 1994*
Center for Women and Hispanic Students Welfare, **University of Colorado at Denver**, Denver, Colorado, U.S.A

- Instructor for remedial courses given by Electrical Engineering Faculty.
- Courses taught include:
  - ◇ *EE 3316 Linear Systems Theory* *Fall 1993*
  - ◇ *EE 3225 Electronics II* *Winter 1994*
  - ◇ *EE 3215 Electronics I* *Fall 1994*

Instructor – Electrical and Computer Engineering *1992–1995*
University of Colorado at Denver, Denver, Colorado, U.S.A

- EE 4467 Communications Laboratory *Summer 1994*
- EE 3215 Electronics Lab I *Winter 1993, 1994*
- EE 3325 Electronics Lab II *Fall 1992, 1993*

Teaching Assistant – Electrical Engineering *1990-1992*
Department of Electrical Engineering, Tulane University, New Orleans, Louisiana, U.S.A.

- ELEN 303 Electronics Lab *Fall 1990*
- ELEN 377 Elements of Electrical Eng. (Machines Lab for Mechanical Engineers) *Fall 1990*
- ELEN 201 Electric circuits I (Lab) *Fall 1991*
- ELEN 202 Electric circuits II (Lab and Marking) *Winter 1991*

Graduate Supervision

Master Thesis Completed

- Mr. S. Venugopal, (2019), Thesis: "*Automatic Arterial Wall Detection and Diameter Tracking Using M-mode Ultrasound*," Co-Supervisor: Prof. Y. Ono, Department of Systems and Computer Engineering, Carleton University, Canada.
- Mr. D. Mitra, (2019), Thesis: "*Investigation of Kronecker-based Compressive Sensing*," Sole Supervision, **Nominated for University Senate Medal.**

- Mr. A. Khedr, (2018), Thesis: "*Signal Processing for Raman Spectroscopy*," Sole Supervision.
- Mr. N. Pradhan (2017), Thesis: "*Evaluation of the Signal Quality of Wrist-Based Photoplethysmography*," Co-Supervisor: Prof. A. Adler, Department of Systems and Computer Engineering, Carleton University, Ottawa, Canada.
- Mr. Z. Baird, (2017) (NSERC OGS), Thesis: "*Human Activity and Posture Classification Using Single Non-Contact Radar Sensor*," Sole Supervision.
- Mr. G. Singh, (2017) Thesis:"*Techniques for Enhancing the Computational Speed of Multiple Object Tracking*", Co-Supervisor: Prof. S. Majumdar, Department of Systems and Computer Engineering, Carleton University, Canada. **University Senate Medal**
- Capt. S. Henault,(2008), Thesis: "*Analysis and Optimization of a Compact Array of Wire Elements for Wideband Direction Finding in Tactical Electronic Warfare*",Co-Supervisor: Prof. Y. M. M. Antar, Royal Military College, Canada. **Nominated for University Medal**

Master Thesis in Progress

- Mr. A. Huang, Co-supervisor: Dr. B Balaji, Defence Research and Development Canada
- Ms. A. Purohit, Co-Supervisor: Prof. J. R. Green, Department of Systems and Computer Engineering, Carleton University, Ottawa, Canada.
- Ms. P. F. Shahmirzadi, Co-Supervisor: Prof. I. Lambadaris, Department of Systems and Computer Engineering, Carleton University, Ottawa, Canada.
- Mr. S. Bakshi, Sole Supervision
- Ms. A. Young, Co-Supervisor: Dr. B. Balaji (Part-time Student)

Doctoral Thesis Completed

- Dr. M. Mabrouk, (2014), Thesis: "*Signal Processing of UWB Radar Return Signals For Human Detection Behind Walls"*, Co-Supervisor: Prof. M. Bolic, School of Electrical Engineering and Computer Science, University of Ottawa, Canada.

Doctoral Thesis in Progress

- Mr. Z. Baird, Sole Supervision
- Mr. M. Abdelazez, ***Vanier Scholar***, Co-Supervisor: Prof. A. D. C. Chan, Department of Systems and Computer Engineering, Carleton University, Canada.
- Ms. F. F. Firouzeh, Co-Supervisor: Prof. J. Chinneck, Department of Systems and Computer Engineering, Carleton University, Canada.
- Mr. A. Huang, Co-Supervisor: Prof. Y. Ono, Department of Systems and Computer Engineering, Carleton University, Canada.
- Mr. H. Chahrour, Co-Supervisor: Prof. R. Dansereau, Department of Systems and Computer Engineering, Carleton University, Canada.
- Mr. A. Alzahrani, Co-Supervisor: Prof. E. Ukwatta, Department of Systems and Computer Engineering, Carleton University, Canada.

- Mr. D. Luong, ***Vanier Scholar***, Co-Supervision: Dr. B. Balaji, DRDC, Ottawa.
- Ms. H. Nematallah, Sole Supervision
- Mr. M. Rashid, Co-Supervisor: Dr. B. Balaji, DRDC, Ottawa. (Part-time student)

PDF, Visiting Professor and Visiting Student Supervision

PostDoctoral Fellows Supervision

- Dr. R. C. C. Wang, "*Anamoly Detection and Rare Event detection*", Sole Supervision. *April 2019-March 2020*
- Dr. H. Sadreazami, "*Fall Detection using Ultra Wideband Radar*", Co-supervisor: Prof. M. Bolic, School of Electrical Eng. and Computer Science, University of Ottawa, Canada *Nov 2017-Dec 2018*
- Dr. I. Nejadgholi, "*Classification of Activities using Doppler-based Radar*", Co-supervisor: Prof. M. Bolic, School of Electrical Eng. and Computer Science, University of Ottawa, Canada *July 2015-Dec 2016*
- Dr. M. Forouzanfar, "*Heart and Breathing Rate Estimation using Doppler-based Radar*", Co-supervisor: Prof. M. Bolic, School of Electrical Eng. and Computer Science, University of Ottawa, Canada. *May 2014-Jan 2015*
- Dr. S. Salari, "*Compressive Sensing for Electronic Warfare Receivers*", Co-supervisors: Prof. I-M. Kim, Department of Electrical and Computer Engineering, Queens University, Canada and Prof. F. Chan, Department of Electrical and Computer Engineering, The Royal Military College, Canada. *May 2013-June 2015*
- Dr. M. Niu, "*Compressive Sensing for Electronic Warfare Receivers*", Co-supervisors: Prof. I-M. Kim, Department of Electrical and Computer Engineering, Queens University, Canada and Prof. F. Chan, Department of Electrical and Computer Engineering, The Royal Military College, Canada. *May 2013-June 2015*
- Dr. S. Lee, "*Uncertainty in Blood Pressure Measurements*", Co-supervisors: Prof. H. R. Dajani, Prof. M Bolic, Prof. V. Z. Groza, School of Electrical Eng. and Computer Science, University of Ottawa, Canada. *Jan 2010-May 2012*
- Dr. S. Ahmad,"*Pulse Rate Variability*",Co-supervisors: Prof. H. R. Dajani, Prof. M Bolic, Prof. V. Z. Groza, School of Electrical Eng. and Computer Science, University of Ottawa, Canada. *2009*

Visiting Professor Supervision

- Dr. P. Xu, Assistant Professor, Jiyang College of Zhejiang A & F University, P. R. China. *September 2019 - April 2021*
- Dr. G. Sarabishiei, Assistant Professor, Sadjad University of Technology, Mashhad, Iran. *June 2017 - July 2017*

Visting Student Supervision

- Mr. R. Crispino, Ph.D. Candidate, Department of Electrical, Electronics and Information Engineering, University of Catania, Italy. *January 2020 - February 2020*

CONTRIBUTION TO GRADUATE SUPERVISION

Active contributor to Supervision

- Contributed actively to the co-supervision of the following students:
  - Mr. M. Forouzanfar (PhD), Thesis : *Computational Intelligence Algorithms for Blood Pressure Monitoring* (Supervisors: Prof. V. Z. Groza and Prof. H. R. Dajani), *2009-2014.*
  - Mr. S. Chen (M.A.Sc.), Thesis: *Robust Blood Pressure Measurement*, (Supervisors: Prof. V. Z. Groza and Prof. M. Bolic), *2008-2010.*
  - Mr. M. Mafi (M.A.Sc.), Thesis: *Blood Pressure Estimation Using Oscillometric Pulse Morphology* (Supervisors: Prof. M. Bolic and Prof. V. Z. Groza), *2010-2012.*
  - Mr. D. A. Abolarin (M.A.Sc.), Thesis: *Non-invasive Estimation of Blood Pressure using Harmonic Components of Oscillometric Pulses* (Supervisor: Prof. V. Z. Groza), *2013-2016.*

UNDERGRADUATE SUPERVISION

Current Undergraduate Supervision

Supervised the following students

- Chris Farah, OmKrishan Rajey, Adam Rocco, Kavichandran Dharmarajan, Thesis: *Dose Prediction Using Optical Techniques* *2019-2020*
- Benjamin Kukhta, Matt Wiles, Mohamed Osman, Hashim Hussen, Umar Sheikh-Omar, Thesis: *Am I Engaged or Am I Disengaged* *2019-2020*
- Kukai Hamada Beaudry, Joseph Lycano, Jason Wang, Thesis: *Augmented Reality Application Development* *2019-2020*
- Abubakar Sadiq Shehu, Seun Lawal, Musab Hassan, David Nzidee, Cedric Kamgang, Thesis: *Machine Learning for Heart Sound Classification* *2019-2020*
- Paul Grant, Geoffrey Nguyen and Abdul-Halim Ratmono, Thesis: *Smart sensor-based Sleep Therapy Using Biofeedback* *2018-2019*
- Kouvner Dhillon, Stefan Murga and Ian Malonda, Thesis: *Smart Phone-based Phonocardiography* *2018-2019*
- Salma Hassan, Yehia Hosny and Andi Huang, Thesis: *Respiratory Effort Estimation using Empatica Watch* *2017-2018*
- Francois Campbell and Madelaine George, Thesis: *Estimating Respiratory Efforts with Empatica Wristband*, *2016-2017*
- Sadman Kabir, Anshuman Srivastava, Kalvin Alexander and Kevin Alexander, Thesis: *Android Application for Computing Heart Rate from PPG Signal obtained from Empatica E4 Wristband*, *2016-2017.*
- Mohamed Alhamwi, Arslan Haq, Idaf Joudeh and Xiaoke Lu, Thesis: *Monitoring of Arduino-based PPG and GSR Signals through an Android Device*, *2015-2016.*
- Yolina Petkova, Kavindi Ranasinghe, Shabiba Siddiq and Kevin Valade, Thesis: *Personal Multi-sensor Display*, *2015-2016.*

Co-supervised the following students

- Diego Politis, Joshua Poole, Juan Delgado Torres, Thesis: *Compressed Sensing and Recovery of ECG*, Co-Supervisor: Prof. P. Garcia, Department of Systems and Computer Engineering, Carleton University, Ottawa *2019-2020*
- Jacob Martin, Dillon Claremont, Amr Mazen, Mustafa Abdulmajeed, Thomas Bryk, Thesis: *Hey Drone, Can you talk?*, Co-Supervisor: Y. Labiche, Department of Systems and Computer Engineering, Carleton University, Ottawa *2019-2020*
- Anthony Calcicuri and Julia St-Jean, Thesis: *Characterization of Drones Using Radar*, Co-Supervisor: Dr. B. Balaji, DRDC, Ottawa *2018-2019*

- Jacob Podhraski, Connor Mckeen and Richard Finney, Thesis: *Machine Learning for Ship Detection and Classification*, Co-Supervisor: Dr. B. Balaji, DRDC, Ottawa *2018-2019*
- Adam Batson, Maxwell Demelo and Richard Carson, Thesis: *Gesture Based Text Input System - Writing in the Air*, Co-Supervisor: Prof. E. Ukwatta, Department of Systems and Computer Engineering, Carleton University, Ottawa, Canada. *2016-2017*
- Kevin Rosengren, Nikola Neskovic and Ian Wong, Thesis: *Google Glass for Chemical Invertory Tracking*, Co-supervisor: Prof. J. R. Green, Department of Systems and Computer Engineering, Carleton University, Ottawa, Canada. *2015-2016*
- Landon Entwistle, Noel Lawan, Phil Grant and Yuxuan Zhao, Thesis: *iOS/Android Application for E4 wristband*, Co-Supervisor: Prof. M. Bolic, School of Electrical Engineering and Computer Science, University of Ottawa, Ottawa, Canada. *2015-2016*
- Daanish Khan and Dragan Trifkovic, Thesis: *Biological Signal Processing using an FPGA*, **Honorable Mention in Innovate Canada 2008 Alterra Design Competition for "FPGA-based Heart Rate Estimator"**, Co-Supervisor: Prof. A. D. C. Chan, Systems and Computer Engineering, Carleton University, Ottawa, Canada *2007-2008.*
- Wen-Yi Que, Ahmer Gulzar, Gurtej Sandhu and Denis Kutman, Thesis: *FPGA-based Implementation of Efficient Four-Quadrant Arctangent Functions*, Co-Supevisor: Prof. A. D. C. Chan, Systems and Computer Engineering, Carleton University, Ottawa, Canada. *2006-2007*

Undergraduate Student Research Supervision

- Mr. Omar Imran, Systems and Computer Engineering 1st year Summer Undergraduate Internship *Summer 2019*
  Research Topic: *Stone Soup*
- Mr. Jason Gao, Systems and Computer Engineering 1st year Summer Undergraduate Internship *Summer 2019*
  Research Topic: *Stone Soup*
- Mr. Stone Liu, Systems and Computer Engineering 1st year Summer Undergraduate Internship *Summer 2018*
  Research Topic: *Fall Detection using non-contact sensors*
- Mr. Zachary Fuller, Systems and Computer Engineering 1st year Summer Undergraduate Internship *Summer 2018*
  Research Topic: *Fall Detection using non-contact sensors*
- Mr. X. May, Carleton University Research Opportunity (CUROP) *Summer 2017*
  Research Topic: *Non-contact Sensor Signal Processing*
- Ms. M. Kaka, Institutional Undergraduate Student Research Assistant *Summer 2016*
  Research Topic: *Brain Computer Interface for Biofeedback Rehabilitation*

JOURNAL ARTICLES

1. F. Zabihollahy, **S. Rajan**, E. Ukwatta, "Machine Learning-based Segmentation of Left Ventricular Myocardial Fibrosis from Magnetic Resonance Imaging," accepted in *Current Cardiology Report*.
2. B. F. Firouzeh, J. W. Chinneck, **S. Rajan**, "Maximum Feasible Subsystem Algorithms for Recovery of Compressively Sensed Speech," *IEEE Access*, Vol. 8, Issue 1, December 2020, pp. 82539-82550.

3. S. Lee, H. Dajani, **S. Rajan**, G. Lee, V. Z. Groza, "Uncertainty in Blood Pressure Measurement Estimated using Ensemble-based Recursive Methodology," *Sensors*, Vol. 20, Issue 7, April 2020.

4. D. Mitra, H. Zanddizari, **S. Rajan**, "Investigation of Kronecker-based Recovery of Compressed ECG Signal," *IEEE Transactions in Instrumentation and Measurement*, Vol. 69, Issue 6, June 2020, pp. 3642-3653.

5. D. Luong, **S. Rajan**, B. Balaji, "Quantum Two-Mode Squeezing Radar and Noise Radar: Correlation Coefficients for Target Detection," *IEEE Sensors Journal*, Vol. 20, Issue 10, May 2020, pp. 5221-5228.

6. D. Luong, **S. Rajan**, B. Balaji, "Entanglement-based Quantum Radar: From Myth to Reality," *IEEE Aerospace and Electronic Systems Magazine*, Vol. 23, No. 4, April 2020, pp. 22-35.

7. H. Sadreazami, M. Bolic, **S. Rajan**, "Fall Detection Using Standoff Radar-based Sensing and Deep Convolutional Network," *IEEE Transactions on Circuits and Systems -II: Express Briefs*, Vol. 67, No. 1, January 2020, pp. 197-201.

8. N. Pradhan, **S. Rajan**, A. Adler, "Evaluation of Signal Quality of Wrist-Based Photoplethysmography", *Physiological Measurements*, Vol. 40, No. 6, July 2019, 065008

9. H. Sadreazami, M. Bolic, **S. Rajan**, "CapsFall: Fall Detection using Ultra Wideband Radar and Capsule Network", *IEEE Access*, Vol. 7, pp. 55336-55343, 2019.

10. I. Nejadgholi, H. Sadreazami, **S. Rajan**, M. Bolic, "Classification of Doppler Radar Reflections as Preprocessing for Breathing Rate Monitoring," *IET Signal Processing*, Vol. 13, Issue. 1, pp. 21-28, February 2019.

11. I. Nejadgholi, H. Sadreazami, Z. Baird, **S. Rajan**, M. Bolic, "Estimation of Breathing Rate with Confidence Interval Using Single-Channel CW Radar", *Journal of Healthcare Engineering*, vol. 2019, Article ID 2658675, 14 pages, 2019.

12. H. Zanddizari, **S. Rajan** and H. Zarrabi, "Increasing the Quality of Reconstructed Signal in Compressive Sensing Utilizing Kronecker Technique," *Springer- Biomedical Engineering Letters*, vol 8, issue 2, 2018, pp. 239-247.

13. G. Singh, **S. Rajan**, S. Majumdar "A Fast Iterative Data Association Technique for Multiple Object Tracking," accepted in Special issue of the International Journal of Semantic Computing (IJSC) Vol. 12, No. 02, 2018, pp. 261-285.

14. B. Li, L. Zhang, T. Kirubarajan and **S. Rajan**, "Projection Matrix Design Method for MSE Reduction in Adaptive Compressive Sensing," *Signal Processing*, Vol. 141, December 2017, pp. 16-27.

15. S. Salari, I-M. Kim, F. Chan, **S. Rajan**, "Blind Compressive-Sensing Based Electronic Warfare Receiver," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 53, No. 4, August 2017, pp. 2014-2030.

16. S. Lee, **S. Rajan**, G. Jeon, J-H. Chang, H. R. Dajani and V. Z. Groza, "Oscillometric blood pressure estimation by combining nonparametric bootstrap with Gaussian mixture model," *Computers in Medicine and Biology*, Vol. 85, June 2017, pp. 112-124.

17. B. Li, L. Zhang, T. Kirubarajan, **S. Rajan**, "Projection Matrix Design Using Prior Information in Compressive Sensing," *Signal Processing*, Vol. 135, June 2017, pp. 36-47.

18. M. Forouzanfar, M. Mabrouk, **S. Rajan**, M. Bolic, H. R. Dajani and V. Z. Groza, "Event Recognition for Contactless Activity Monitoring Using Phase-Modulated Continuous Wave Radar," *IEEE Transactions in Biomedical Engineering*, Vol 64, Issue 2, February 2017, pp. 474-491.

19. X. Jiang, **S. Rajan**, X. Liu, "Wirtinger Flow Method With Optimal Stepsize for Phase Retrieval," *IEEE Signal Processing Letters*, Vol. 23, Issue 11, November 2016, pp. 1627-1631.

20. Y. Guo, R. Tharmarasa, **S. Rajan**, T. L. Song, T. Kirubarajan, "Passive Tracking in Heavy Clutter With Sensor Location Uncertainty," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 52, No. 4, 2016, pp. 1536-1554.

21. M. Forounzanfar, H. R. Dajani, V. Z. Groza, M. Bolic, **S. Rajan** and I. Batkin, "Bayesian Fusion Algorithm for Improved Oscillometric Blood Pressure Estimation" *Medical Engineering and Physics*, available on line Aug 16, 2016.

22. M. Mabrouk, **S. Rajan**, M. Bolic, M. Forounzanfar, H. R. Dajani and I. Batin, "Human breathing rate estimation from radar returns using harmonically related filters," *Journal of Sensors*, Vol. 2016 (2016), Article ID 9891852.

23. X. Jiang, W-J. Zeng, H. C. So, **S. Rajan** and T. Kirubarajan, "Robust Matched Filtering in l_p Space," *IEEE Transactions on Signal Processing*, Vol.63, No.23, December 2015, pp.6184-6199.

24. B. Li, Y. Shen, **S. Rajan** and T. Kirubarajan, "Sparse Signal Recovery from Noisy Measurements using Generalized OMP Algorithm: New Theoretical Results," *Signal Processing*, Vol. 117, December 2015, 270-278.

25. M. Forouzanfar, H.R. Dajani, V. Z. Groza, M. Bolic, **S. Rajan** and I. Batkin, "Oscillometric Blood Pressure Estimation: Past, Present and Future," *IEEE Reviews in Biomedical Engineering*, Vol. 8, 2015, pp. 44-63.

26. M. Niu, S. Salari, I-M. Kim, F. Chan and **S. Rajan**, "Recovery Probability Analysis for Sparse Signals via OMP," *IEEE Transactions on Aerospace and Electronics Systems*, Vol. 51, No. 4, October 2015, pp. 3475-3479.

27. S. Lee, **S. Rajan**, C-H. Park, J-H Chang, H. R. Dajani and V. Z. Groza, "Estimated Confidence Interval from Single Blood Pressure Measurement based on Algorithmic Fusion," *Computers in Biology and Medicine*, Vol. 62, Issue C, July, 2015, pp. 154-163.

28. B. R. Jackson, **S. Rajan**, B. Liao and S. Wang, "Direction of Arrival Estimation using Directive Antennas in Uniform Circular Arrays," *IEEE Transactions on Antennas and Propagation*, Vol. 63, No. 2, February 2015, pp. 736-747.

29. M. Forouzanfar, H. Dajani, V. Z. Groza, M. Bolic, **S. Rajan** and I. Batkin, "Ratio-Independent Blood Pressure Estimation by Modeling the Oscillometric Waveform Envelope," *IEEE Transactions on Instrumentation and Measurement*, Vol. 63, Issue 10, October, 2014, pp. 2501-2503.

30. S. Lee, J-H. Chang, S. W. Nam, C. Lim, **S. Rajan**, H. R. Dajani and V. Z. Groza, "Oscillometric Blood Pressure Estimation based on Maximum Amplitude Algorithm Employing Gaussian Mixture Regression," *IEEE Transactions on Instrumentation and Measurement*, Vol. 62, No. 12, December 2013, pp. 3387-3389.

31. Q. Zhang, O. A. Dobre, Y. A. Eldemerdash, **S. Rajan** and R. Inkol, "Second-Order Cyclostationarity of BT-SCLD Signals: Theoretical Developments and Applications to Signal Classification and Blind Parameter Estimation," *IEEE Transactions on Wireless Communications*, Vol. 12, No. 4, April, 2013, pp. 1501-1511.

32. S. Henault, Y. M. M. Antar, **S. Rajan**, R. Inkol and S. Wang, "Effects of Mutual Coupling on the Accuracy of Adcock Direction Finding Systems," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 48, issue 4, 2012, pp.2990-3005.

33. O. A. Dobre, M. Oner, **S. Rajan** and R. Inkol, "Cyclostationarity-based Algorithms for QAM Signal Identification," *IEEE Communication Letters*, Vol. 16, No. 1, January 2012, pp. 12-14.

34. S. Lee, M. Bolic, V. Z. Groza, H. R. Dajani, **S. Rajan**, "Confidence Interval Estimation for Oscillometric Blood Pressure Measurements Using Bootstrap Approaches," *IEEE Transactions on Instrumentation and Measurement*, Vol. 60, No. 10, October 2011, pp. 3405-3415.

35. M. Forouzanfar, H. R. Dajani, V.Z. Groza, M. Bolic and **S. Rajan**, "Feature-based Neural Network Approach for Oscillometric Blood Pressure Estimation," *IEEE Transactions on Instrumentation and Measurement*, Vol. 60, No. 8, August 2011, pp. 2786-2795.

36. S. Chen, M. Bolic, V. Groza, H. Dajani and **S. Rajan**, "Extraction of Breathing Signal and Suppression of its Effects in Oscillometric Blood Pressure Measurement," *IEEE Transactions on Instrumentation and Measurement*, Vol. 60, No. 5, May 2011, pp. 1741-1750.

37. A Punchihewa, Q. Zhang, O. Dobre, C. Spooner, **S. Rajan** and R. Inkol, "On the Cyclostationarity of OFDM and Single Carrier Linearly Digitally Modulated Signals in the Time Dispersive Channels: Theoretical Developments and Application," *IEEE Transactions on Wireless Communications*, Vol 9, No. 8, August 2010, pp2588-2599.

38. S. Ahmad, M. Bolic, H. Dajani, V. Groza, I. Batkin and **S. Rajan**,"Measurement of Heart Rate Variability Using an Oscillometric Blood Pressure Monitor," *IEEE Transactions on Instrumentation and Measurement*, Vol. 59, No. 10, October. 2010, pp. 2575-2590.

39. S. Wang, R. Inkol, **S. Rajan** and F. Patenaude, "Detection of Narrowband Signals through the FFT and Poly-phase FFT Filter Banks: Non-Coherent vs Coherent Integration," *IEEE Transactions on Instrumentation and Measurement*, Vol. 59, No. 5, May 2010, pp. 1424-1438.

40. S. Henault, Y. M. M. Antar, **S. Rajan**, R. Inkol and S. Wang, "The Multiple Antenna Induced Emf Method for the Precise Calculation of the Coupling Matrix in a Receiving Antenna Array," *Progress in Electromagnetics Research M*, Vol. 8, 2009, pp. 103-118.

41. O. Dobre, **S. Rajan** and R. Inkol, "Joint Signal Detection and Classification based on First-Order Cyclostationarity for Cognitive Radios," *Special Issue of EURASIP Journal on Advances in Signal Processing -Dynamic Spectrum Access for Wireless Networking*, Vol 2009 (article ID 656719).

42. S. Wang, R. Inkol, **S. Rajan** and F. Patenaude, "On the Performance Gain of the FFT Filter Bank-based Summation and Majority CFAR Detectors," *IEEE Transactions on Instrumentation and Measurement*, Vol. 58, No. 5, May 2009, pp. 1778-1788.

43. **S. Rajan**, S. Wang and R. Inkol, "An Error Reduction Technique for Four-quadrant Arctangent Approximations," *IET Signal Processing*, Vol. 2, No. 2, June 2007, pp. 133-138.

44. **S. Rajan**, S. Wang, R. Inkol and A. Joyal, "Efficient Approximations for the Arctangent Function," *IEEE Signal Processing Magazine*, DSP Tips and Tricks Column, May 2006, pp. 108-111.

45. **S. Rajan**, K. S. Joo and T. Bose, "Analysis of 2-D State Space Periodically Shift Variant Discrete System," *Circuits, Systems and Signal Processing*, Vol. 15, No. 3, 1996, pp. 395-413.

Chapter in Books

1. **S. Rajan**, S. Wang, R. Inkol and A. Joyal, "Efficient approximations for the arctangent function," Chapter 27 in Streamlining Digital Signal Processing: A Tricks of the Trade Guidebook, IEEE Press, II Edition, Edited by Richard G. Lyons, 2012.

Full Paper Refereed Conference Papers

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15. C. N. Gupta, R. Palaniappan, **S. Rajan**, S. Swaminathan, S.M.Krishnan, "Segmentation and Classification of Heart Sounds," *IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)*, pp. 1674-1677, Saskatoon, SK, Canada, 2005.

16. **S. Rajan**, R. Doraiswami and M. Stevenson, "A Supervised Uncued Classification Strategy for a Class of Multicomponent Signal Classification," *IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)*, pp. 655-660, Vol. 2, Edmonton, AB, Canada, 1999.

17. R. Balasubramaniam, **S. Rajan**, R. Doraiswami and M. Stevenson, "Using Misclassified Training Samples to Improve Classification," *IEEE Conference on Man, Systems and Cybernetics*, pp. 4296-4300, Vol.5, San Diego, CA, USA, 1998.

18. R. Balasubramaniam, **S. Rajan**, R. Doraiswami and M. Stevenson, "A Reliable Composite Classification Strategy," *IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)*, pp. 914-917, Vol. 2, Waterloo, ON, Canada, 1998.

19. K. S. Joo, **S. Rajan**, T. Bose, "On 2-D Periodically Shift Variant Digital Filters," *IEEE Midwest Symposium on Circuits and Systems*, pp. 592-595, Rio de Janeiro, Brazil, 1995.

20. **S. Rajan**, K. S. Joo, T. Bose, M. Q. Chen, "Conjugate Gradient Method for Adaptive Nonlinear Filtering," *IEEE Midwest Symposium on Circuits and Systems*, pp. 1327-1330, Vol. 2, Lafayette, LA, USA, 1994.

21. R. M. Babu, S. Das, G. Sen, **R. Sreeraman**, B. B. Biswas and G. Govindarajan, "Microprocessor based Protection System for KAMINI Reactor," *National Power Systems Conference*, pp. 549-551, Bombay, India, June 1990.

22. L. R. Jangra, **R. Sreeraman**, G. Sen, B.B. Biswas and G. Govindarajan, "Microprocessor based Pneumatic Carrier Facility," *National Conference on Electronic Circuits and Systems (NACONECS-89)*, University of Roorkee, India, November 1989.

23. R. M. Babu, S. Das, G. Sen, **R. Sreeraman**, B. B. Biswas and G. Govindarajan, "Fault Detection Techniques used in Process Control and Trip systems in KAMINI Reactor," *National Symposium on Current trends in Process Instrumentation and Control*, Indira Gandhi Center for Atomic Research, Kalpakkam, India, October 1988.

24. S. Das, G. Sen, R. Geethakumari, **R. Sreeraman**, B. Biswas and G.Govindarajan, "Programmable Digital Comparator System for a Nuclear Power Reactor," *National Symposium on Current Trends in Process Instrumentation and Control*, Indira Gandhi Center for Atomic Research, Kalpakkam, India, October 1988.

Papers under review

1. H. Sadreazami, M. Bolic, **S. Rajan**, "Contactless Fall Detection Using Time-Frequency Analysis and Deep Neural Network," resubmitted after first revision to *IEEE Transactions on Industrial Electronics*.

2. H.Zanddizari, **S. Rajan**, H. Rabah, H. Zarrabi, "Privacy-Assured Outsourcing of Compressive Sensing Recovery Service in Cloud for ECG Signal," submitted to *IEEE Transactions on Information Forensics and Security*.

3. M. Abdelazez, **S. Rajan**, A. D. C. Chan, "Detection of Atrial Fibrillation in Compressively Sensed Electrocardiogram Measurements," submitted to *IEEE Transactions in Instrumentation and Measurement*.

4. Z. Baird, M. K. McDonald, **S. Rajan**, S. Lee, "A CNN-LSTM Network for Augmenting Target Detection in Real Maritime Wide Area Surveillance Radar Data," submitted to *IEEE ACCESS*.

5. D. Luong, **S. Rajan**, B. Balaji, "Quantum Two-Mode Squeezing Radar and Noise Radar: Correlation Coefficient and Integration Time," submitted to *IEEE Sensors letters*.

6. P. Klaer, A. Huang, P. Sevigny, **S. Rajan**, B. Balaji, "Micro-Doppler radar signal processing for rotary drone detection and identification," submitted to *SPIE Defense - Commercial Sensing*, 2020.

7. S. Behbehani, H. Ahmadieh, **S. Rajan**, "A Review of Feature Extraction Methods Perform in Electroretinogram Signal Analysis," submitted to *Medical and Biological Engineering and Computing*.

Papers under preparation

1. D. Mitra, H. Zanddizari, **S. Rajan**, "Aspect-ratio Preserving Compressive Sensing and Recovery of 2-D signals."

2. K. Shanmugaraja, F. Zabihollahy, Y. Ono, **S. Rajan**, "Automatic artery wall detection using machine learning for diameter tracking in M-mode ultrasound."

Technical Reports (Peer reviewed)

1. D. Luong, **S. Rajan**, N. de Lautour, B. Balaji, "Quantum Rf Sensing," Contribution to TTCP ISTAR TP-2 SA 13, DRDC Ottawa Scientific Report DRDC-RDDC-2020-Rxxx (Unclassified)

2. **S.Rajan**, P. Beaulne, H-J. Du, M. Low, C. O´ Regan, Q. Xiao, "Scoping Study for Royal Canadian Air Force Radio Frequency Electronic Warfare Gaps," *DRDC Ottawa Scientific Report DRDC-RDDC-2015-R300* (Classified Secret).

3. B. R. Jackson, B. Liao, **S. Rajan**, S. Wang, "Theory, Design and Measurement of Novel Uniform Circular Antenna Arrays for Direction of Arrival Estimation," *DRDC Ottawa Scientific Report DRDC-RDDC-2015-R010* (Unclassified).

4. **S. Rajan** and C. Wu, "An Overview of Compressive Sensing-based Receivers," *DRDC Ottawa Technical Memorandum TM 2013-149*. (Unclassified)

5. C. Wu, and **S. Rajan**, "Study of Fast Fourier Sampling Algorithm for Ultra Wideband Digital Receiver Application," *DRDC Ottawa Technical Report TR 2013-139*. (Unclassified)

6. **S. Rajan** and F. Dilkes, Canadian Contribution to the TTCP report on TTCP EWS TP4 Task13- Long Range Geolocation.

7. F. Dilkes and **S. Rajan**, "Cross-Platform Electronic Surveillance using Co-operative Receivers: Assessment of Data from an Airborne Trial" *DRDC Ottawa Technical Report TR 2012-173* (Controlled Goods, Protected B)

8. **S. Rajan** and F. Dilkes, "Signal Processing Fundamentals for Geolocation Using Multi-platform Co-operative Coherent Receivers," *DRDC Ottawa Technical Memorandum TM 2012-101* (Classified Secret)

9. **S. Rajan**, F. Dilkes and J-F. Rivest, "Requirements for passive geolocation receivers," *DRDC Ottawa Technical Memorandum TM 2010-258* (Classified Secret).

10. S. Wong, W. Chamma, **S. Rajan**, F. Dilkes, R. Robinson, A. Walsh and H.Fitzgerald, "Experimental Analysis of a Passive Detection Technique for RF Target Characterization," *DRDC Ottawa Technical Memorandum TM 2010-238* (Classified Secret).

11. F. Arpin, W. Chamma, J. Dubois, D. Dyck, L. Forland, B. Ford, A. Jeffrey, S. Jetté-Charbonneau, S. Gauthier, V. Larochelle, J. Lee, R. Leatage, M. Low, P. Moo, T. Ollevier, **S. Rajan**, F. Reid, E. Riseborough, J. Rivest, S. Roy, A. Thomson, W. Tunnicliffe, C. Wilcox, S. Wong and C. Wu,"Above Water Warfare Sensors and Effectors Options Analysis: CSC Task A17 Phase 1," *DRDC Ottawa Technical Report TR 2010-114* (Unclassified, Protected B)

12. S. Wang, R. Inkol, **S. Rajan** and F. Patenaude, "Comparison of the Vector-Sum and Angle-Sum Angle of Arrival Averaging Methods: Mathematical Derivations," *DRDC Ottawa Technical Memorandum TM 2010-131.* (Unclassified)

13. R. Inkol, **S. Rajan**, S. Wang, L. Mai and J. Pinnell, "An Assessment of the TCI 903 Direction Finding System: Full Report," *DRDC Ottawa Technical Memorandum TM 2009-250* (Unclassified, Protected B).

14. R. Inkol, **S. Rajan**, S. Wang, L. Mai and J. Pinnell, "An Assessment of the TCI 903 Direction Finding System," *DRDC Ottawa Technical Memorandum TM 2009-245.* (Unclassified)

15. S. Wang, R. Inkol, **S. Rajan**, F. Patenaude, "Theory of the FFT Filter Bank-based Majority and Median CFAR Detectors," *DRDC Ottawa Technical Report TR 2007-088.* (Unclassified)

16. R. Doraiswami and **S. Rajan**, "Detection and Classification of Phonocardiogram Signals," Unclassified, Technical report submitted to Siemens Corporate Research, Princeton, U.S.A., February 1998.

17. T. Bose and **S. Rajan**, "Enhancement of Sinusoid using Adaptive Notch Filters," Unclassified, Technical report submitted to Micro Motion Inc, U.S.A., 1994.

PATENTS

1. Y. Ono, M. Yoshida, A. Huang, **S. Rajan**, "Method and Apparatus for Ultrasonic Continuous Measurement of Blood Vessel Diameter", U.S. Patent Application-US 62/685344 Filed June 15, 2018.

2. M. Mabrouk, I. Batkin, **S. Rajan**, M. Bolic, H. Dajani and V. Groza, "Remote Sensing of Human Breathing at a Distance", U.S. Patent 10401479 Granted on Sep 3, 2019.

3. S. Henault, Y. M. M. Antar, **S. Rajan**, R. Inkol and S. Wang, "The Multiple Antenna Induced EMF Method (MAIEM)," DRDC File 1416-08/010CA , Report of Invention, July 2008.

4. R. Inkol, **S. Rajan**, S. Wang and F. Patenaude and M. Dufour, "Robust Signal Detection and Direction Finding Technique," DRDC File 1416-07/21 (DBDO 6), Report of Invention, 31 May 2007.

5. R. L. Watrous, N. Reichek, **S. Rajan** and D. Nikovski, WO 01/22883 A1, "Multi-Modal Cardiac Diagnostic Decision Support System and Method," Pub. Date 5th April 2001.
6. H. V. Derby, T. Bose, **S. Rajan**, U.S. Patent number 5,555,190: "Method and Apparatus for Adaptive Line Enhancement in Coriolis Effect Mass Flow Meter Measurement," 1996 (also shows up as WO9703339 (A1); EP0838020 (A1); US5555190 (A1); EP0838020 (A0); EP0838020 (B1); RU2155325 (C2); AU704345B (B2), CN 2208452)

Invited Presentations

1. **S. Rajan**, "Sensing in the IoT Era", **Keynote Speaker**, *Second IEEE International Symposium on Sensing and Instrumentation in IoT Era*, August 2019.
2. M. Abdelazez, **S. Rajan**, "Signal Quality: From Wearables to Hospitals", **Tutorial Speaker**, *IEEE International Instrumentation and Measurement Conference*, May 2019.
3. **S. Rajan**, "Artificial Intelligence and Machine Learning," **Panelist**, *Data Day 5.0*, Carleton University, March, 2018.
4. **S. Rajan**, "When All Knowns Are Unknowns", **Keynote Speaker**, *Carleton University TA Training Day*, January. 2018.
5. **S. Rajan**, "Remote Vital Sign Monitoring", *Ingenious Talks Series*, December 2017.
6. **S.Rajan** and M. Bolic, "NonContact Life Sign Monitoring for Inmates", *Use of Technology for Correctional Services Conference*, 2017.
7. M. Tarar, **S. Rajan** and M. Bolic, "Radar and 3D Motion Sensor System for Contactless Monitoring of Seniors", Champlain Fall Prevention Steering Committee, Regional Geriatric Program of Eastern Ontario, August 2017.
8. **S. Rajan**, "Sensor Systems and Data Analytics", Manitoba Advanced Sensors Centre of Excellence-MASCoE workshop on Sensors, NRC Ottawa, August 2016.
9. **S. Rajan**, "Treasure Trove: Signal Processing Intelligently," Department of Systems and Computer Engineering, Carleton University, May 2014.
10. **S. Rajan**, "An Overview of Electronic Protection and Electronic Support Measures," (Unclassified), Canadian Systems Electronic Course, April 2014.
11. **S. Rajan**, "General EP/ES Overview," (Unclassified), Canadian Systems Electronic Course, April 2013.
12. **S. Rajan**,"IEEE Pulse Waveform Standard," (Unclassified), Conductive Weapons Strategy Initiative Workshop, October 2011.
13. **S. Rajan**,"STEP-UP to Rise," Poster Presentation, IEEE Sections Congress, August 2011.
14. **S. Rajan**, S. Wang, R. Inkol and F. Patenaude, "On Detection of Signals," (Unclassified), Oral Presentation at the Workshop on SMART ARM 2009, November 2009.
15. **S. Rajan**, F. Dilkes, H-J Du, "Report on Action Item on Long Range Geolocation, Task 13 on TP4," (Classified Secret), Presentation to the Task 13 Group on TTCP EWS TP4 at AFRL, Dayton, Ohio, October 2009.

16. **S. Rajan**, "Update on Kaizen," (Classified Secret), Presentation to the TTCP EWS Joint TP2-TP4 at AFRL, Dayton, Ohio, October 2009.
17. **S. Rajan**, S. Wang, R. Inkol and F. Patenaude, "Angle Averaging Strategies," (Unclassified), Presentation to the TTCP EWS TP4 at DRDC Ottawa, May 2009.
18. **S. Rajan**, "Detection, Demodulation and Automatic Modulation Recognition," (Unclassified) Part of Canadian National Brief at TTCP EWS TP2, Australia, 2009. (Presented on behalf by Mr. A. Mudry)
19. **S.Rajan**, "Communication Electronic Warfare," Course for Canadian Electronic Warfare Officers, 2008.
20. R. Inkol, S. Wang and **S. Rajan**, "FFT filter bank-based CFAR Detection Schemes," (Unclassified), Poster in DRDC Ottawa CNEW Open House, October 2007.
21. S. Wang, R. Inkol and **S. Rajan**, "FFT Filter Bank-based CFAR Detectors," (Unclassified), Presentation to the TTCP-EWS-TP2, Ottawa, February 2007.
22. O.A. Dobre, **S. Rajan**, R. Inkol and S. Wang, "Automatic Modulation Recognition," (Unclassified), Presentation to TTCP-EWS-TP2, Ottawa, February 2007.

Non-refereed Presentations and Posters

1. B. F. Firouzeh, J. Chinneck, **S. Rajan**,"A Maximum Feasible Subset Approach for Compression of Speech Signals", Carleton RADS Poster Fair, Oct. 2018.
2. M. Abdelazez, S. Sreeraman, A. D. C. Chan, **S. Rajan**, "Application of Signal Quality in ECG Biometrics", Medical Devices Innovation Institute and NSERC CREATE Poster Fair, Sep. 2017.
3. G. Singh, **S. Rajan**, S. Majumdar, "Fast and Scalable Techniques for Multiple Object Tracking", Poster, Carleton University Data Day 4.0, 2017. **Second Prize with cash Award $ 500**
4. G. Singh, **S. Rajan**, S. Majumdar, "An Offline Multi-stage Tracking-by-detection approach for tracking multiple pedestrians", Oral Presentation, Canadian Tracking and Fusion Workshop, 2016.

Grants

- 2020 Carleton COVID Rapid Response Research Grant: $12,000, *Co-investigator*
- 2020 Carleton University Faculty Research Award: $10,000
- 2020 NSERC Collaborative Research and Development: $498,000, (NSERC part $249,000) *Principal Investigator*
- 2020 NRC Research Contract: $24,000, *Principal Investigator*
- 2019 IDEAS Micronet Grant: $1,500,000, *Co-applicant*
- 2019 Carleton University Multidisciplinary Research Catalyst Fund, $20,000, *Co-applicant*
- 2019 Carleton University Multidisciplinary Research Catalyst Fund: $100,000 (2 grants $50,000 each) *Co-applicant*
- 2019 Field's Institute CQAM Grant: $ 60,000 *Principal Investigator*
- 2019 Carleton University Research Impact Endeavour (CURIE) fund: $750, *Principal Investigator*
- 2019 CRC Annual Research Stipend: $20,000 *Prinicipal Investigator*

- 2017 JELF CFI Grant: $150,000, *Principal Investigator*
- 2017 ORF Grant (part of CFI): $150,000, *Principal Investigator*
- 2017 NSERC Engage Grant: $25,000, *Principal Investigator* item 2017 IEEE Foundation Grant, US $25,000 *Co-applicant*
- 2016 IEEE Canada Foundation Grant: Virtual Histories of Assistive Technologies $2,500 *Lead applicant, co-applicant Prof. A. D. C. Chan*
- 2016-2017 NSERC I2I Grant: $135,533, *Co-applicant*
- 2016-2020 NSERC Discovery Grant: $175,000 *Principal Investigator*
- 2015-2020 Research Expense Grant: $50,000 *Principal Investigator*
- 2015 Start up Grant $30,000 *Principal Investigator*
- 2015-2019 Canada Research Chair (Tier II) Sensor Systems: $500,000, *Principal Investigator*
- 2012-2015 DRDC Technology Investment Fund: $500,000, *Principal Investigator*
- 2013-2015 Royal Canadian Air Force: $50,000, *Principal Investigator*
- 2014-2017 Correctional Services Canada: $98,850, *Co-applicant*
- 2014-2016 Correctional Service Canada: $49,800$, *Co-applicant*

Awards and Recognition

Awards and Recognition

- Carleton University Faculty Research Award *2020*
- Outstanding Engineering Educator Award, IEEE Ottawa Section *2019*
- 2018-2019 CUSA Teaching Excellence Award, Carleton University *2019*
- Outstanding Engineer Award, IEEE Ottawa Section *2018*
- Faculty Graduate Mentoring Award (FGMA), Carleton University *2018*
- Raving Raven for Teaching Excellence, Office of the Associate Vice-President (Teaching & Learning), Carleton University *2017*
- IEEE Wally S. Read Outstanding Service Award *2016*
- Tier 2 Canada Research Chair, NSERC, Canada *2015*
- Outstanding Contribution Award, Defence Research and Development Canada, Ottawa *2013*
- IEEE MGA Achievement Award *2012*
- Queen Elizabeth II Diamond Jubilee Medal *2012*
- Outstanding Volunteer Award, IEEE Ottawa Section *2012*
- Competent Leader, Toastmasters Inc. *2012*
- IEEE MGA Best Large Section Award *2011*
- IEEE Engineering in Medicine and Biology Society Best Chapter Award *2011*
- Competent Communicator, Toastmasters Inc. *2011*
- IEEE Canada Best Large Section Award *2011*
- IEEE Ottawa Best Chapter Award for IEEE Ottawa Engineering in Medicine and Biology Society Chapter *2010*
- IEEE Ottawa Best Chapter Award for IEEE Ottawa Engineering in Medicine and Biology Society Chapter *2008*
- Wally Reed GOLD Best Paper Award *2008*
- Recognition Award for successful DRDC Workshop in IEEE CCECE *2006*
- Best Mentor Award, Dalhousie University Co-op Program *2002*
- Tuition Scholarship, University of Colorado at Denver *1992-1995*
- Tuition Scholarship, Tulane University *1990-1992*
- Second Rank, Bharathiyar University *1987*
- Government of India Merit Scholarship *1982-1986*

PROFESSIONAL AFFILIATIONS

- 2006-Present: Senior Member, Institute of Electrical and Electronics Engineer
- 2019: IEEE Aerospace and Electronic Systems: Member
- 1990-2010,2018-Present: IEEE Signal Processing Society: Member
- 2006-Present: IEEE Engineering and Medicine Society: Member
- 2013-Present: IEEE Instrumentation and Measurement Society: Member
- 2007-2016: IEEE Communication Society: Member
- 2004-2006: Member, Institute of Electrical and Electronics Engineer
- 08/1990-2004: Institute of Electrical and Electronics Engineers (IEEE) Student Member

SERVICES

Services to Profession

- 2020 Technical Program Committee Member, 2021 IEEE Second International Conference on Control, Measurement and Instrumentation (CMI)
- 2020 Session Chair, IEEE Measurements in Medical Applications (MeMeA)
- 2019 Member, Organization Committee, Ottawa AI Alliance Workshop
- 2019 Chair, IEEE Ottawa Aerospace and Electronics Systems Chapter
- 2019 General Co-Chair, IEEE Global Conference on Signal and Information Processing
- 2019 Academic Co-Chair, Canadian Medical and Biological Engineering Conference
- 2019 Workshop Chair, IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE 2019)
- 2019 Session Co-chair, IEEE Sensors Application Symposium
- 2018 Session Co-Chair, IEEE International Symposium on Medical Measurements and Applications
- 2017-8/2018 External Relations Group Chair, IEEE Canada
- 2017-2018 Section Vitality Chair, IEEE Canada
- 2016 Member, Steering Committee, First International Workshop on Research Advancements in Future Networking Technologies (RAFNET 2016)
- 2016 Co-Chair, Technical Program Committee, Electrical Power and Energy Conference (EPEC)
- 2015 Member, Technical Program Committee, IEEE International Symposium on Innovations in Intelligent Systems and Applications (INISTA)
- 2015 Member, Technical Program Committee, Second International Symposium on Signal Processing and Intelligent Recognition Systems (SIRS2015)
- 2015 Member, IEEE MGA Strategic Development and Environmental Assessment Committee
- 2015-2017 Member, IEEE MGA Admissions and Advancement Committee
- 2015 Co-Chair, Patronage Committee, IEEE Integrated Management (IM 2015)
- 2015 Co-Chair, Student Travel Grants, IEEE Integrated Management (IM 2015)
- 2015 Co-Chair, Sponsorship and Industry Liaison, Canadian Workshop on Information Theory

- 2015 Member, Advisory Board, IEEE International Humanitarian Technology Conference (IHTC 2015)
- 2015 Member, Finance Committee, IEEE International Humanitarian Technology Conference (IHTC 2015)
- 2014-2015, Organizing Committee Member, Canadian Tracking and Fusion Workshop
- 2015 Co-Chair, Industry/Government Liaison and Sponsorships, IEEE Canadian Workshop on Information Theory
- 2013-2015 Chair, IEEE Canada Eastern Area
- 2013-2014 Member, IEEE Canada Nomination Committee
- 2013-2014 Chair, IEEE Ottawa Section Nomination Committee
- 2015 Member, IEEE Ottawa Section Nomination Committee
- 2012, Member, Technical Program Committee, IEEE Vehicular Technology Conference
- 2017-8/2018 Member, IEEE Canada Executive Committee
- 2011-8/2018 Member, IEEE Canada Board
- 2011-2012 Chair, IEEE Ottawa Section
- 2009-2010 Chair, IEEE Ottawa Section AGM
- 2009-2010 Vice Chair, IEEE Ottawa Section
- 2007-2008 Treasurer, IEEE Ottawa Section
- 2007-2016 Member, IEEE Ottawa Section Awards Committee
- 2007-present Chair, IEEE Ottawa Chapter of Engineering in Medicine and Biology Society
- 2009-present Chair, IEEE Ottawa Section Senior Member Committee
- 2009-present Steering Committee Member, IEEE Midwest Symposium on Circuits and Systems
- 2005-2006 Vice Chair, IEEE Ottawa Chapter of Engineering in Medicine and Biology Society
- 2014, Industry and Sponsorship Liaison Chair, IEEE Queen's Biennial Symposium
- 2013 Associate General Chair, IEEE Radar Conference
- 2013 Member, Technical Program Committee, Canadian Engineering in Medicine and Biology Society Conference
- 2013 Co-Chair, Partnership Program, IEEE Radar Conference
- 2013 Technical Program Committee Member, International Conference on Computational Intelligence and Virtual Environment for Measurement Systems and Applications
- 2012 Track Chair, IEEE International Workshop on High-Performance Chips, Package and Systems

- 2012 Co-Chair, Local Arrangements, IEEE International Conference on Communications
- 2012 Member, Executive Committee, IEEE International Conference on Communications
- 2012 Co-Chair, Bioengineering circuits and systems, IEEE Midwest Symposium on Circuits and Systems
- 2011 Member, Technical Program Committee, IEEE International Conference on Communications
- 2010 Member, Steering Committee, IEEE Symposium on Medical Measurements and Applications
- 2010 Co-ordinator, Biomed/Optoelectronics Technical Streams of IEEE NewFoundland Electrical and Computer Engineering Conference
- 2010 Member, Technical Program Committee, IEEE Global Communications Conference
- 2010 Co-Chair, Local Arrangements, IEEE Vehicular Technology Conference-Fall
- 2010 Member, Technical Program Committee, IEEE Vehicular Technology Conference-Spring
- 2009 Co-Chair, Signal and Multi-media Processing Symposium, IEEE Canadian Conference on Electrical and Computer Engineering
- 2009 Member, Program Committee, IEEE Conference on Computational Intelligence for Security and Defense Applications
- 2008-2010 Member, Steering Committee, Technical Organizing Committee, IEEE Workshop on Adverse Response to Monitoring
- 2008, 2007 Judge, IEEE Eastern Ontario Student Oral Paper Competition
- 2008 Session Chair, 24th IEEE Biennial Queen's Symposium on Communications
- 2008 Session Chair for Standards and Medical Applications II, IEEE Symposium on Medical Measurements and Applications
- 2008 Member, Steering Committee, IEEE Symposium on Medical Measurements and Applications
- 2008 Co-Chair, Signal and Multi-media Processing Symposium, IEEE Canadian Conference on Electrical and Computer Engineering
- 2007 Co-Chair, DSP Track-III, IEEE MidWest Symposium on Circuits and Systems
- 2007 Member, Organizing Committee, IEEE Workshop on Blood Pressure Measurements and Standardization Seminar
- 2007 Member, Organizing Committee, IEEE FPGA Workshop, Ottawa
- 2007 Member, Review Panel Committee for DSP track, IEEE MidWest Symposium on Circuits and Systems
- 2006 Member, Organizing Committee, IEEE Canadian Conference on Electrical and Computer Engineering

- 2006 Track Chair and Organizer, DRDC Workshop, IEEE Canadian Conference on Electrical and Computer Engineering
- 2006 Sessions Chair, DSP Track-III, IEEE Canadian Conference on Electrical and Computer Engineering

Journal Reviewer

- Reviewer for Annals of Biomedical Engineering, IEEE Transactions on Circuits and Systems-II, IEEE Transactions on Aerospace and Electronics, IEEE Transactions on Instrumentation and Measurements, IEEE Transactions on Wireless Communication, IEEE Transactions on Biomedical Engineering, IEEE Reviews on Biomedical Engineering, IEEE Signal Processing Magazine, EURASIP Journal on Wireless Communications, Digital Signal Processing, Canadian Journal of Electrical and Computer Engineering, Journal of System Architecture, IET Signal Processing, IET Microwave, Antennas and Propagation.
- Associate Editor, *Canadian Journal of Electrical and Computer Engineering 2013-present*

Conference Reviewer

- Regular Reviewer for IEEE GlobeCom, IEEE ICC, IEEE VTC (Fall and Spring), IEEE WCNC, IEEE LISA, IEEE CCECE, IEEE ISCAS, IEEE MWSCAS, International Conf on Sig. Processing and Communications, IEEE MeMeA, Itherm Conference, IEEE NECEC and WCSP

Grants and Proposals Assessor

- Reviewer for NSERC: Industrial Research Chair for Colleges, Strategic Projects Proposals, CREATE Proposals and DISCOVERY grants
- Strategic Review Panel Member of Ontario Research Funds for Large Infrastructure Grants
- Reviewer for MITACS Proposals
- Reviewer for Reviewer for Applied Research Proposals for Royal Military College, Kingston, Ontario, Canada
- Reviewer for Internal University Grant proposals of University of Western Ontario, London, Ontario, Canada
- Reviewer for Atlantic Canada Opportunities Agencies

Services to the University

External University Examiner for PhD

- Mr. Yousef Ali *Dec 2019*
  Dissertation title: *Objective Estimation of Tracheoesophageal Speech Quality*, Department of Electrical and Computer University, Western University, Canada
- Mr. Hershel Caytak *Nov 2018*
  Proposal Title: *Bioimpedance spectroscopy methods for analysis and control of neurostimulation dose*, School of Electrical Engineering and Computer Science, University of Ottawa (within the Ottawa Carleton Institute for Electrical and Computer Engineering).

External University Examiner for M.A.Sc

- Mr. S. He *Dec 2018*
  Thesis title: *Time-interval based Blood Pressure Measurement Technique and System*
  Thesis Supervisor: Prof. M. Bolic, School of Electrical Engineering and Computer Science, University of Ottawa (within the Ottawa Carleton Institute for Electrical and Computer Engineering).

- Mr. F. F. T. Kemdjo *Aug. 2018*
  Thesis title: *Recognition and Classification of Aggressive Motion using Smartwatches*
  Thesis Supervisors: Prof. N. Baddour and Prof. E. Lemaire, Department of Mechanical Engineering, University of Ottawa (within the Ottawa Carleton Institute for Biomedical Engineering).

- Mr. N. Primeau *Oct. 2017*
  Thesis title: *Risk-Aware Decision Support for Critical Infrastructure Protection using Multi-Objective Optimization*
  Thesis Supervisors: Prof. E Peitru and Prof. R. Abeilmona, School of Electrical Engineering and Computer Science, University of Ottawa (within the Ottawa Carleton Institute for Electrical and Computer Engineering).

- Mr. A. Plachkov *Oct. 2016*
  Thesis title: *Soft Data-Augmented Risk Assessment and Automated Course of Action Generation for Maritime Situational Awareness*
  Thesis Supervisors: Profs. V. Groza, R. Abielmona, Emil Peitru and Diana Inkpen, School of Electrical Engineering and Computer Science, University of Ottawa (within the Ottawa Carleton Institute for Electrical and Computer Engineering).

- Mr. G. W Somers *July 2016*
  Thesis title: *Acceleration of Block-Aware Matrix Factorization on Heterogeneous Platforms*
  Thesis Supervisors: Prof. E. Gad and Prof. M. Bolic, School of Electrical Engineering and Computer Science, University of Ottawa (within the Ottawa Carleton Institute for Electrical and Computer Engineering).

- Mr. E. Poliakov *Apr. 2012*
  Thesis title: *Virtual Receiving Array Method for Direction of Arrival Estimation Using Direct Data Domain Techniques and Signal Cyclostationarity*
  Thesis Supervisors: Prof. Y. M. Antar and Dr. Chen Wu, Department of Electrical Engineering, Royal Military College, Kingston, Ontario, Canada.

External Departmental Examiner for M.A.Sc

- Ms. A. Mazurkiewicz *May 2020*
  Thesis title: *Effects of brain gyrification on impact-induced strain measurements with a preliminary study on viable ex-vivo porcine brain*
  Thesis Supervisor: Prof. O. E. Petel, Prof. H. Frei, Department of Mechanical and Aerospace Engineering, Carleton University (within the Ottawa Carleton Institute for Electrical and Computer Engineering)

- Mr. E. F. A. Calzadillas *Oct 2019*
  Thesis title: *Sparse Video Visual Odometry With Local Non-Linear Least Squares Optimization for Navigation of Autonomous Vehicles*
  Thesis Supervisor: Prof. J. Sasiadek, Department of Mechanical and Aerospace Engineering, Carleton University (within the Ottawa-Carleton Institute for Electrical and Computer Engineering

- Mr. S. Abujoub *Sept 2019*
  Thesis title: *Development of a Landing Period Indicator and the use of Signal Prediction to Improve Landing Methodologies of Autonomous Unmanned Aerial Vehicles*

on Maritime Vessels
Thesis Supervisor: Prof. R. Irani, Department of Mechanical and Aerospace Engieering, Carleton University (within the Ottawa-Carleton Institute for Electrical and Computer Engineering

- Mr. M. K. Emara *April 2018*
Thesis title: *Dispersion Engineered Radiative and Guided Wave Electromagnetic Structure for Efficient Wave Control*
Thesis Supervisors: Prof. S. Gupta and Prof. J Wight, Department of Electronics, Carleton University (within the Ottawa Carleton Institute for Electrical and Computer Engineering).

- Capt. G. Dufour *Sept. 2017*
Thesis title: *Self Stabilizing Switched Beam Offset Reflector (3SBOR) Antenna*
Thesis Supervisor: Prof. J. Wight, Department of Electronics, Carleton University (within the Ottawa Carleton Institute for Electrical and Computer Engineering).

- Mr. A. Nagy *Jan. 2017*
Thesis title: *Multilateration and Kalman Filtering Techniques for Stealth Intelligence Surveillance and Reconnaissance using Multistatic Radar*
Thesis Supervisor: Prof. J Wight, Department of Electronics, Carleton University (within the Ottawa-Carleton Institute for Electrical and Computer Engineering).

- Mr. O. Marsh *Sept. 2016*
Thesis title: *Silicon-on-Insulator Biosensor using microring resonators and ring-assisted mach-zhender interferometers*
Thesis Supervisor: Prof. W. Yee, Department of Electronics, Carleton University (within the Ottawa-Carleton Institute for Electrical and Computer Engineering).

- Mr. A. R. M. Haidari *Sept. 2016*
Thesis title: *Retrospective Dosimetric Monte Carlo Study for Permanent Implant Prostate Brachytherapy at the Ottawa Hospital Cancer Centre*
Thesis Supervisors: Prof. R. Thomson and Prof. J Cygler, Department of Physics, Carleton University (within the Ottawa-Carleton Institute for Biomedical Engineering).

External Departmental Examiner for PhD Proposal

- Mr. Hershel Caytak *May 2017*
Proposal Title *Optimization of Transcranial Direct Current Stimulation: Investigation of the Relationships Between Relative Head Tissue Sensitivity Distribution and Multi-frequency Impedance Signal Characteristics* , School of Electrical Engineering and Computer Science, University of Ottawa (within the Ottawa-Carleton Institute for Electrical and Computer Engineering).

External Examiner for PhD Written/Oral Comprehensive Exam

- Mr. M. Sadhegi, *May 2019*
- Ms. S. S. Gilakjani *April 2019*
- Mr. S. Alfattani, *April 2018*
- Mr. M. Mabrouk, *Sept 2013*

Service to the Department: Examination Committee Member

Member of Dissertation Examination Committee

- Ms. F. Zabihollahy *April 2020*
  Dissertation title: *Deep Learning Methods For Abnormality Detection and Segmentation in Computer Tomography and Magnetic Resonance Images*
  Thesis Supervisors: Profs. E. Ukwatta, J. R. Green

- Mr. H. Harvey *May 2019*
  Dissertation title: *Biometric Quality and its Impact on Template Ageing in Longitudinal Fingerprint Study*
  Thesis Supervisors: Prof. A. Adler, Dr. J. Campbell

- Mr. A. M. Assem *Aug. 2017*
  Thesis title: *Low Latency Compressive Sensing using Multi-resolution Analysis in Radar Signal Processing*
  Thesis Supervisor: Prof. R. Dansereau

- Ms. H. Dehghan *May 2016*
  Thesis title: *Convolutive Blind Sparse Source Separation with Application to EMG Decomposition*
  Thesis Supervisors: Prof. R. Dansereau and Prof. A. D. C. Chan

- Ms. Z. Zeinelkhani *Sept. 2015*
  Thesis title: *Compressive Sensing of Block Sparse Signals with Applications to Wideband Sensing*
  Thesis Supervisor: Prof. A. Banihashemi

Member of Proposal Defence Examination Committee

- Ms. T. L. Mahyari *Apr 2020*
  Proposal title: *Image Separation using Multi-layer Image Segmentation for Translucent Partially Overlapped Objects*

- Ms. R. Gbadeyan *Feb 2020*
  Proposal title: *Object Layer Based Hybrid Video Compression*

- Mr. C. C. Lu *Sep 2019*
  Proposal title: *Real time Identification of Sub-cortical Structures During Deep Brain Stimulation Surgery*

- Mr. I. AlMohimeed *Aug 2019*
  Proposal title: *Design and Construction of Wearable and Flexible Ultrasonic Sensor Using Double-Layer PVDF Films for Continuous Monitoring and Quantitative Analysis of Muscle Contraction*

- R. Miner III *June 2018*
  Proposal title: *Quantitative PET imaging of the Left Atrium for the Investigation of Physiological Processes in Atrial Fibrillation*

- Mr. A. M. Assem *Aug. 2017*
  Proposal title: *Compressive Sensing in Radar Signal Processing*

- Ms. H. Dehghan *May 2016*
  Proposal title: *Convolutive Blind Sparse Source Separation with Application to EMG Decomposition*

Chairman of Proposal Defence Examinations

- Mr. B. Karimi *May 2020*
  Proposal title: *Construction of QC-LDPC Codes with Low Error Floor by Ecient Systematic Search and Elimination of Trapping Sets*

- Mr. H. Sokun *Apr. 2017*
  Proposal title: *Enhancing Energy and Spectral Efficiencies in Cellular and Heterogeneous Networks*

- Mr. J. Harvey *Nov. 2016*
  Proposal title: *Evaluation of quality metrics in a large-scale longitudinal fingerprint study*

- Mr. A. Biswas *Apr. 2016*
  Proposal title: *Auto-scaling Techniques for Cloud Environments with Service Level Agreements*

- Mr. T. Beitelmal *Apr. 2016*
  Proposal title: *Cell Switch off Approach for Energy Saving in Cellular Networks*

Chairman of PhD Written Comprehensive Examination

- Ms. K. Beange *May 2020*
- Ms. A. Gal *May 2019*
- Ms. M. C. McFarlane *Nov 2018*
- Mr. S Stowe *Sept 2018*

Chairman of PhD Oral Comprehensive Examination

- Mr. R. Mohamed *June 2020*
- Mr. M. Abdelazez *May 2017*
- Mr. B. Karimi *May 2017*
- Ms. S. Naseri *May 2016*
- Mr. M. Haggag *June 2016*

Member of Oral Comprehensive Examination

- Ms. E Farago *May 2019*
- Mr. I. Showalter *June 2018*
- Ms. F. F. Firouzeh *June 2017*
- Ms. O. Mohammed *June 2017*
- Mr. S. Salsabili *June 2017*
- Ms. M. A. Bahramabadi *May 2016*
- Mr. A. N. Aghdam *May 2016*

Chairman of M.A.Sc Defence Committee

- Mr. E. Reveron *Aug 2019*
  Thesis title: *A Framework for Traffic Collision Prediction Using Historical Accident Information and Real-Time Sensor Data: A Case Study for the City of Ottawa*
  Thesis Supervisor: Prof. A-M. Cretu, Department of Systems and Computer Engineering, Carleton University

- Mr. N. Echegini *Sept 2018* Thesis title: *A DHT-based Routing Solution for Hierarchical MANETS*
  Thesis Supervisor: Prof. T. Kunz, Departemnt of Systems and Computer Engineering, Carleton University

- Mr. J. Singh *July 2018*
  Thesis title: *An Adaptive System to Allocate VM in Cloud for Secure Remote Access using AutoRegression*
  Thesis Supervisors: Prof. M. St. Hilaire and Prof. S. Majumdar, Department of Systems and Computert Engineering, Carleton University.

- Mr. P. Balogun *Jan 2016*
  Thesis title: *Multilevel Polar Codes for Grassmanian Signalling*
  Thesis Supervisors: Prof. I. Marsland and Prof. H. Yanikomeroglu, Department of Systems and Computer Engineering, Carleton University

Member of M.A.Sc Defence Committee

- Ms. J. Lee *Sept. 2018*
  Thesis title: *Development of a Method for Registering Surface of Left Atrium Determined by LGE-MRI to ElectroAnatomical Maps*
  Thesis Supervisors: Prof. E. Ukwatta and Dr. R. Thornhill, Department of Systems and Computer Engineering, Carleton University

- Ms. F. Zabihollahy *Aug. 2016*
  Thesis title: *Continuous Monitoring of Mechanical Properties of Plantar Soft Tissue Using Wearable Ultrasonic and Force Sensors for Diabetic Patients*
  Thesis Supervisor: Prof. Y. Ono, Department of Systems and Computer Engineering, Carleton University.

- Mr. J. Wong *Jan. 2016*
  Thesis title: *Evaluation of an Interactive Video Tracking System using Face Recognition*
  Thesis Supervisor: Prof. A. Adler, Department of Systems and Computer Engineering, Carleton University.

- Mr. P. Tworzydlo *Jan. 2016*
  Thesis title: *Monitoring Breathing using a Doppler Radar*
  Thesis Supervisor: Prof. A. D. C. Chan, Department of Systems and Computer Engineering, Carleton University.

- Mr. M. Rashid *Dec. 2015*
  Thesis title: *Cramer-Rao Lower Bound Derivation and Performance Analysis for Space-based SAR*
  Thesis Supervisor: Prof. R. Dansereau, Department of Systems and Computer Engineering, Carleton University.

- Mr. J. Wagenaar *Sept. 2015*
  Thesis title: *Electrical Impedance Tomography in 3D: Characterization and Evaluation*
  Thesis Supervisor: Prof. A. Adler, Department of Systems and Computer Engineering, Carleton University.

ADMINISTRATIVE DUTIES

Director, Ottawa-Carleton Institute for Biomedical Engineering (OCIBME)
July 2020 – present

- Chair the bi-annual Board of Management meetings of the Institute

- Approve and maintain the membership intake of the Institute
- Manage the graduate course offering across both the Universities
- Manage the graduate student intake into the graduate programs including Clinical Engineering
- Lead the Cyclical review process whenever needed

Associate Director, Ottawa-Carleton Institute for Biomedical Engineering (OCIBME) *July 2016 – June 2020*

- Co-ordinate bi-annual Board of Management meetings of the Institute
- Co-ordinate the graduate courses offering across the Universities with the Director of the Institute
- Manage and approve the membership intake of the Institute
- Manage the intake of M.Eng and M. Clinical Eng. students of the Biomedical Engineering Graduate Program

Program Co-ordinator, Communication Engineering Program July 2020 – June 2021

- **Attend DAPC meetings and manage the Communication Engineering curriculum**

Member, Autonomous Systems Institute Initiative ***2018 – Present***

- **Develop strategy and provide directions for Carleton's Autonomous Systems Institute Initiative**

Member, University NSERC Scholarship Selection Committee ***2019 – Present***

- **Review and rank applications across the University for NSERC Scholarships**

Member (Non-Voting), Graduate Faculty Board ***2018 – Present***

- **Represent OCIBME in Graduate Faculty Board**

Member, Adhoc Committee for Graduate Recruitment ***2018 – Present***

- **Develop strategies to attract domestic undergraduate and graduate students students to the Department**

Chairman, Hiring Committee for Biomedical Faculty Position ***2019***

- Co-ordinate the hiring process

Member, Hiring Committee for Mechanical/Systems shared Canada Research Chair Position *2019*

- Actively participate in the hiring process

Mentor, Internal Departmental Student Clubs *2018-2019*

- Guide the student clubs within the department