Vinicius Prado da Fonseca, Ph.D.

Contact Information

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Memorial University of Newfoundland
Department of Computer Science
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Areas of Interest

Robotics, Artificial Intelligence, Tactile Sensors, Human-computer interaction, Human-robot interaction, Smart prosthesis.

Work Experience

Memorial University of Newfoundland, St. John's, NL CAN

Assistant Professor 2020F -

- Joined the Department of Computer Science of the Memorial University of Newfoundland in July, 2020.
- Instructor: **Introduction to Robotic Manipulation** (W25) **Topics in AI** (W22, W24, W25) **Computer Archtecture** (F20, W21, F21, W22, F22, F23, W23) **Operating Systems** (F21, W22, F22, W23)

University of Ottawa, Ottawa, ON CAN

Teaching Assistant 2015F - 2019F

- Courses: Digital Systems I, Computer Architecture I, Electrical Engineering Design Project: Part I&II, Analysis and Design of User Interfaces, Software Engineering Capstone Project, Operating Systems, Robotics: Control, Sensing and Intelligence

Research Assistant 2015W - 2019F

- BioIn Robotics Laboratory
- Provide operational and administrative support to Research Manager, with several tasks among others, update records, oversee experiments and handle samples.
- Supervisor: Prof Emil M. Petriu PhD

National Laboratory of Scientific Computing, Petrópolis, RJ BRA

Researcher 2014-02 - 2014-08

- Research in Massively Parallel Processors.
- Programming and assistance pf PhD and master students with implementation of algorithms using C++ and Python.

Laboratory of Applied Computational Intelligence, Rio de Janeiro, RJ BRA

Web Developer 2013-09 - 2014-08
We development with C# and .Net environments for hydro reservoir used in energy generation.

- Software Developer, Scheme: full time
- Programming, Web development
- week working hours: 40

Academic Background

University of Ottawa, Ottawa, ON CAN

PhD, Electrical and Computer Engineering, Feb 2020

- Thesis: *Object Identification and Pose Estimation Using Bio-Inspired Tactile-Enabled Multi-Joint Fingers for In-Hand Manipulation*

- Supervisor: Emil M. Petriu, Ph.D.
- Field: Robotics, In-hand manipulation, Tactile Sensors.

IME - Military Institute of Engineering, Rio de Janeiro, RJ BRA

Master of Science, Systems and Computing, Jun 2013

- Master thesis: *Location system to support a domestic assistant robot using RSS and ZigBee.*
- Supervisor: Professor Paulo Fernando Ferreira Rosa, Ph.D.
- Field: Smart Environments, Wireless Sensor Networks.

UFT - Federal University of Tocantins, Palmas, TO BRA

Bachelor of Science, Computer Science, December 2010

- Final Project: *People Recognition by the Step Sounds Using ART Type Self-Organizing Neural Networks.*
- Supervisor: Rafael Lima de Carvalho, D.Sc.
- Field: Artificial Intelligence, Smart Environments, Neural Networks.

Funded Research

Tactile sensing for the next generation of robotic and prosthetic manipulation ($160,000.00)

Principal Investigator
Natural Sciences and Engineering Research Council of Canada (NSERC) - Discovery grant. 05-2024 04-2029.
This research program focuses on enhancing robotic manipulation using tactile sensing and AI, specifically improving after-grasp object pose estimation, object recognition, and physical properties extraction.

NSERC DG Supplements ($12,500.00)

Principal Investigator
Natural Sciences and Engineering Research Council of Canada (NSERC) - Discovery grant Suplement. 05-2024 04-2029.
Supplements to the NDG.

Next-generation Intelligent Interface for Natural Prosthetic Hand Control ($237,750)

Co-applicant
Social Sciences and Humanities Research Council of Canada (SSHRC) - NFRF-Exploration. 2023-03 2025-03.
This project aims to enable prosthetic hands with vision and haptic functions utilizing computer vision and tactile sensing techniques.

Multi-sensor data streams from PLC to cloud computing platform ($15,000.00)

Principal Investigator
Mitacs BSI, Industry Sponsor: Instrumar Ltd.
This study explores the integration of multi-sensor data streams from Programmable Logic Controllers (PLCs) into cloud computing platforms, enabling real-time monitoring and analysis of industrial processes.

Quorum DMS Core On-Premise Transition / QCloud Migration Project($60,000.00)

Principal Investigator
Mitacs BDS, Industry Sponsor: Quorum Information Technologies Inc.
This project focuses on transitioning the Quorum DMS Core system from an on-premise setup to the QCloud platform, enabling enhanced scalability, accessibility, and performance.

Improved Machine Learning for Uncrewed Ground Vehicle ($30,000.00)

Co-Principal Investigator
Mitacs BSI, Industry Sponsor: Compusult Ltd.
This work enhances machine learning algorithms for Uncrewed Ground Vehicles (UGVs), improving autonomy, decision-making, and adaptability in dynamic environments.

Product development and research for applications of genetic data in nutritional advice through machine learning ($90,000.00)

Co-Principal Investigator
Mitacs BSI, Industry Sponsor: NutraForge Technologies Inc.
This project leverages machine learning to develop products and conduct research on using genetic data for personalized nutritional advice.

Intelligent Interface for Natural Prosthetic Hand Control ($15,000.00)

Co-Principal Investigator
Mitacs L2M BSI, I-INC Foundation for Business Development L2M
This initiative aims to secure funding opportunities for students, supporting their academic and professional growth through scholarships, grants, and research assistantships.

NSERC I2I: Intelligent Interface for Natural Prosthetic Hand Control (Market Assessment, $15,000.00)

Co-Principal Investigator
NSERC Idea to Innovation (I2IPJ)
The NSERC Idea to Innovation (I2I) grant supported a market assessment for the Intelligent Interface for Natural Prosthetic Hand Control.

Data fusion and feature extraction for the classification of godet temperatures and broken filaments events using multisensor data from fiber industry ($60,000)

Co-Principal investigator
Instrumar - Mitacs Accelerate grant.
Develop approaches to fuse and extract features from multiple sensors for detecting godet temperature and broken filaments indicating the root cause.

Active Learning Strategies for Time-series Data in Fiber Industries ($60,000)

Co-Principal investigator
Instrumar - Mitacs Accelerate grant.
Develop new computational approaches to reduce the labelling efforts in time-series for fiber industries.

Developing a Low-Cost Tactile-Enabled Human-Like Robotic Hand ($10,000)

Principal investigator
Memorial University of Newfoundland Seed, Bridge and Multidisciplinary Fund.
Adapting tactile sensing to open-source designs and recent developments in machine learning can make intelligent prostheses more affordable and reliable.

Start-up Grant ($40,000)

Principal investigator.
Faculty of Science Start-up Grant, Memorial University.
Faculty of Science start-up grant to assist new faculty setup initial research in the Department of Computer Science.

Honors & Awards

Scholarship ($12,000)

University of Ottawa
International Doctoral Scholarship provided by the University of Ottawa.

Scholarship ($130,000)

Coordination for the Improvement of Higher Level Personnel (CAPES - Brazilian Ministry of Education Agency)
Selected by CAPES to receive a scholarship during to pursue the PhD degree at the University of Ottawa, Canada.

Scholarship ($45,000 BRL)

Coordination for the Improvement of Higher Level Personnel (CAPES - Brazilian Ministry of Education Agency)
Selected by IME (the Military Institute of Engineering) to receive a scholarship from CAPES during two years to pursue the MSc degree in Systems and Computing

Publications and contributions (Total 43)

Under Review

[1] Maliheh Marzani et al. «Texture Recognition on Uneven Surfaces Using Deep Learning and Tactile Sensing Techniques». In: *IEEE ICRA 2025* (2025).

[2] Elaheh Mohammadreza, Vinicius Prado da Fonseca, and Xianta Jiang. «Investigating the Impact of Training Protocols on Myoelectric Pattern Recognition Control in Upper-Limb Amputees». In: *IEEE Transactions on Neural Systems & Rehabilitation Engineering* (2024).

[3] Laurent Yves Emile Ramos Cheret, Vinicius Prado da Fonseca, and Thiago E. Alves de Oliveira. «Enhancing tactile texture recognition from haptic surface reconstruction using reinforcement learning». In: *IEEE ICRA 2025* (2025).

Accepted

[4] Viral Galaiya et al. «Object Manipulation using Multimodal, Tactile-based Sensing and Reinforcement Learning». In: *IEEE SYSCON 2025* (2025).

[5] Viral Galayia et al. «A Multimodal Dataset for Robotic Peg Extraction Based on Bioin-Tacto Sensor Modules». In: *Data in Brief* (2024).

[6] Alexandre dos Santos Boente et al. «Comparing IMU-equipped Parallel and Flexible Grippers for Tactile Object Classification». In: *IEEE IECON 2024* (2024).

Journal Papers

[7] Thiago Eustaquio Alves de Oliveira and Vinicius Prado da Fonseca. «BioIn-Tacto: A compliant multi-modal tactile sensing module for robotic tasks». In: *HardwareX* 16 (Dec. 2023), e00478. ISSN: 2468-0672. DOI: 10.1016/j.ohx.2023.e00478. URL: http://dx.doi.org/10.1016/j.ohx.2023.e00478.

[8] Shemonto Das, Vinicius Prado da Fonseca, and Amilcar Soares. «Active learning strategies for robotic tactile texture recognition tasks». In: *Frontiers in Robotics and AI* 11 (Feb. 2024). ISSN: 2296-9144. DOI: 10.3389/frobt.2024.1281060. URL: http://dx.doi.org/10.3389/frobt.2024.1281060.

[9] Thiago Eustaquio Alves De Oliveira et al. «Touch sensing for humanoid robots». In: *IEEE Instrumentation & Measurement Magazine* 18.5 (2015), pp. 13–19.

[10] Vinicius Prado da Fonseca et al. «Tactile object recognition in early phases of grasping using underactuated robotic hands». In: *Intelligent Service Robotics* 15.4 (July 2022), pp. 513–525. ISSN: 1861-2784. DOI: 10.1007/s11370-022-00433-7. URL: http://dx.doi.org/10.1007/s11370-022-00433-7.

[11] Viral Rasik Galaiya et al. ≪Exploring tactile temporal features for object pose estimation during robotic manipulation≫. In: *Sensors* 23.9 (2023), p. 4535.

[12] Salman Haidri et al. ≪PTRAIL — A python package for parallel trajectory data preprocessing≫. In: *SoftwareX* 19 (July 2022), p. 101176. ISSN: 2352-7110. DOI: 10.1016/j.softx.2022.101176. URL: http://dx.doi.org/10.1016/j.softx.2022.101176.

[13] Maliheh Marzani et al. ≪A dataset for tactile textures on uneven surfaces collected using a BioIn-Tacto sensing module≫. In: *Data in Brief* 59 (2025), p. 111312. ISSN: 2352-3409. DOI: https://doi.org/10.1016/j.dib.2025.111312. URL: https://www.sciencedirect.com/science/article/pii/S2352340925000447.

[14] Bruno Monteiro Rocha Lima et al. ≪A multimodal tactile dataset for dynamic texture classification≫. In: *Data in Brief* 50 (Oct. 2023), p. 109590. ISSN: 2352-3409. DOI: 10.1016/j.dib.2023.109590. URL: http://dx.doi.org/10.1016/j.dib.2023.109590.

[15] Jordan T.P. Noel, Vinicius Prado da Fonseca, and Amilcar Soares. ≪The Use of Momentum-Inspired Features in Pre-Game Prediction Models for the Sport of Ice Hockey≫. In: *International Journal of Computer Science in Sport* 23.1 (Feb. 2024), pp. 1–21. ISSN: 1684-4769. DOI: 10.2478/ijcss-2024-0001. URL: http://dx.doi.org/10.2478/ijcss-2024-0001.

[16] Jordan Truman Paul Noel, Vinicius Prado da Fonseca, and Amilcar Soares. ≪A Comprehensive Data Pipeline for Comparing the Effects of Momentum on Sports Leagues≫. In: *Data* 9.2 (Feb. 2024), p. 29. ISSN: 2306-5729. DOI: 10.3390/data9020029. URL: http://dx.doi.org/10.3390/data9020029.

[17] Vinicius Prado da Fonseca, Thiago Eustaquio Alves de Oliveira, and Emil M. Petriu. ≪Estimating the Orientation of Objects from Tactile Sensing Data Using Machine Learning Methods and Visual Frames of Reference≫. In: *Sensors* 19.10 (May 2019), p. 2285. ISSN: 1424-8220. DOI: 10.3390/s19102285. URL: http://dx.doi.org/10.3390/s19102285.

[18] Shuo Wang et al. ≪Integrating computer vision to prosthetic hand control with sEMG: Preliminary results in grasp classification≫. In: *Frontiers in Robotics and AI* 9 (Sept. 2022). ISSN: 2296-9144. DOI: 10.3389/frobt.2022.948238. URL: http://dx.doi.org/10.3389/frobt.2022.948238.

Conferences Papers

[19] Thiago Eustaquio Alves de Oliveira et al. ≪End-Effector Approach Flexibilization in a Surface Approximation Task Using a Bioinspired Tactile Sensing Module≫. In: *2019 IEEE International Symposium on Robotic and Sensors Environments (ROSE)*. IEEE, June 2019, pp. 1–6. DOI: 10.1109/rose.2019.8790433. URL: http://dx.doi.org/10.1109/rose.2019.8790433.

[20] Igor Cardoso et al. ≪Comparing Pre-Trained Object Detection Models for Autonomous Grasp on Affordable Prosthetic Hands≫. In: *2024 IEEE International Symposium on Medical Measurements and Applications (MeMeA)*. IEEE, June 2024, pp. 1–6. DOI: 10.1109/memea60663.2024.10596873. URL: http://dx.doi.org/10.1109/memea60663.2024.10596873.

[21] Humberto Navarro de Carvalho et al. ≪Evaluating Data Representations for Object Recognition During Pick-and-Place Manipulation Tasks≫. In: *2022 IEEE International Systems Conference (SysCon)*. IEEE, Apr. 2022, pp. 1–6. DOI: 10.1109/syscon53536.2022.9773911. URL: http://dx.doi.org/10.1109/syscon53536.2022.9773911.

[22] Laurent Y. E. Ramos Cheret, Vinicius Prado Da Fonseca, and Thiago E. Alves de Oliveira. «Leveraging Compliant Tactile Perception for Haptic Blind Surface Reconstruction». In: *2024 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE, May 2024, pp. 17139–17145. DOI: 10.1109/icra57147.2024.10610162. URL: http://dx.doi.org/10.1109/icra57147.2024.10610162.

[23] Ana-Maria Cretu et al. «Computational intelligence and mechatronics solutions for robotic tactile object recognition». In: *2015 IEEE 9th International Symposium on Intelligent Signal Processing (WISP) Proceedings*. IEEE, May 2015. DOI: 10.1109/wisp.2015.7139165. URL: http://dx.doi.org/10.1109/wisp.2015.7139165.

[24] Shemonto Das et al. «Unbalanced Fault Classification Using Active Learning in Synthetic Fiber Manufacturing Process». In: *2024 IEEE International Systems Conference (SysCon)*. IEEE, Apr. 2024, pp. 1–8. DOI: 10.1109/syscon61195.2024.10553615. URL: http://dx.doi.org/10.1109/syscon61195.2024.10553615.

[25] Thiago Eustaquio Alves de Oliveira et al. «Data-driven analysis of kinaesthetic and tactile information for shape classification». In: *2015 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA)*. IEEE, June 2015, pp. 1–5. DOI: 10.1109/civemsa.2015.7158615. URL: http://dx.doi.org/10.1109/civemsa.2015.7158615.

[26] Vinicius Prado da Fonseca et al. «Fuzzy controlled object manipulation using a three-fingered robotic hand». In: *2017 Annual IEEE International Systems Conference (SysCon)*. IEEE, Apr. 2017, pp. 1–6. DOI: 10.1109/syscon.2017.7934753. URL: http://dx.doi.org/10.1109/syscon.2017.7934753.

[27] Vinicius Prado da Fonseca et al. «In-Hand Telemanipulation Using a Robotic Hand and Biology-Inspired Haptic Sensing». In: *2019 IEEE International Symposium on Medical Measurements and Applications (MeMeA)*. IEEE, June 2019, pp. 1–6. DOI: 10.1109/memea.2019.8802139. URL: http://dx.doi.org/10.1109/memea.2019.8802139.

[28] Viral Rasik Galaiya et al. «Grasp Approach Under Positional Uncertainty Using Compliant Tactile Sensing Modules and Reinforcement Learning». In: *2024 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)*. IEEE. 2024, pp. 424–428.

[29] Yaksh J. Haranwala et al. «A Dashboard Tool for Mobility Data Mining Preprocessing Tasks». In: *2022 23rd IEEE International Conference on Mobile Data Management (MDM)*. IEEE, June 2022, pp. 278–281. DOI: 10.1109/mdm55031.2022.00059. URL: http://dx.doi.org/10.1109/mdm55031.2022.00059.

[30] Daniel J. Kucherhan et al. «Object Recognition Through Manipulation Using Tactile Enabled Prosthetic Fingers and Feedback Glove - Experimental Study». In: *2018 IEEE International Symposium on Medical Measurements and Applications (MeMeA)*. IEEE, June 2018, pp. 1–6. DOI: 10.1109/memea.2018.8438757. URL: http://dx.doi.org/10.1109/memea.2018.8438757.

[31] Bruno Monteiro Rocha Lima et al. «Dynamic Tactile Exploration for Texture Classification using a Miniaturized Multi-modal Tactile Sensor and Machine Learning». In: *2020 IEEE International Systems Conference (SysCon)*. IEEE, Aug. 2020. DOI: 10.1109/syscon47679.2020.9275871. URL: http://dx.doi.org/10.1109/syscon47679.2020.9275871.

[32] Vinicius Prado da Fonseca. «Tactile Sensor Analysis during Early Stages of Manipulation for Single Grasp Identification of Daily Objects». In: *The 8th International Symposium on Sensor Science*. I3S 2021. MDPI, May 2021, p. 56. DOI: 10.3390/i3s2021dresden-10091. URL: http://dx.doi.org/10.3390/i3s2021dresden-10091.

[33] Vinicius Prado da Fonseca et al. «Stable grasping and object reorientation with a three-fingered robotic hand». In: *2017 IEEE International Symposium on Robotics and Intelligent Sensors (IRIS)*. IEEE, Oct. 2017, pp. 311–317. DOI: 10.1109/iris.2017.8250140. URL: http://dx.doi.org/10.1109/iris.2017.8250140.

[34] Bruno Monteiro Rocha Lima, Thiago Eustaquio Alves de Oliveira, and Vinicius Prado da Fonseca. «Classification of Textures using a Tactile-Enabled Finger in Dynamic Exploration Tasks». In: *2021 IEEE Sensors*. IEEE, Oct. 2021, pp. 1–4. DOI: 10.1109/sensors47087.2021.9639755. URL: http://dx.doi.org/10.1109/sensors47087.2021.9639755.

[35] Bruno Monteiro Rocha Lima et al. «Heart Rate Detection Using a Miniaturized Multimodal Tactile Sensor». In: *2019 IEEE International Symposium on Medical Measurements and Applications (MeMeA)*. IEEE, June 2019. DOI: 10.1109/memea.2019.8802209. URL: http://dx.doi.org/10.1109/memea.2019.8802209.

[36] V Naga Sai Siddhartha Danyamraju et al. «Comparing Data Representation Techniques for Tactile Sensing in Classification Tasks». In: *2023 IEEE SENSORS*. IEEE, Oct. 2023, pp. 1–4. DOI: 10.1109/sensors56945.2023.10325260. URL: http://dx.doi.org/10.1109/sensors56945.2023.10325260.

[37] Alexandre dos Santos Boente et al. «Small Scale Unmanned Aircraft System and Photogrammetry Applied for 3D Modeling of Historical Buildings». In: *Proceedings of the Twelfth International Conference on Sensor Device Technologies and Applications SENSORDEVICES, Athens, Greece*. 2021, pp. 14–18.

[38] Maxwell Welyhorsky et al. «Neuro-Fuzzy Grasp Control for a Teleoperated Five Finger Anthropomorphic Robotic Hand». In: *2022 IEEE International Systems Conference (SysCon)*. IEEE, Apr. 2022, pp. 1–5. DOI: 10.1109/syscon53536.2022.9773821. URL: http://dx.doi.org/10.1109/syscon53536.2022.9773821.

[39] Da Zhi et al. «Teaching a Robot Sign Language using Vision-Based Hand Gesture Recognition». In: *2018 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA)*. IEEE, June 2018, pp. 1–6. DOI: 10.1109/civemsa.2018.8439952. URL: http://dx.doi.org/10.1109/civemsa.2018.8439952.

[40] Qi Zhu et al. «Teleoperated Grasping Using a Robotic Hand and a Haptic-Feedback Data Glove». In: *2020 IEEE International Systems Conference (SysCon)*. IEEE, Aug. 2020, pp. 1–7. DOI: 10.1109/syscon47679.2020.9275927. URL: http://dx.doi.org/10.1109/syscon47679.2020.9275927.

Other

[41] Viral Galaiya et al. *Tactile-Based Robotic Peg Extraction Dataset*. Ed. by "Mendeley Data". 2024. DOI: 10.17632/94ztxrz6vy.1. URL: https://data.mendeley.com/datasets/94ztxrz6vy/1.

[42] Salman Haidri et al. *PTRAIL - A python package for parallel trajectory data preprocessing*. Apr. 2022. URL: https://pypi.org/project/ptrail/.

[43] Maliheh Marzani et al. *Dynamic Tactile Data of Textures On Uneven Surfaces*. Ed. by "Mendeley Data". 2024. DOI: 10.17632/khpwng8thh.1. URL: https://data.mendeley.com/datasets/khpwng8thh/1.

[44] Bruno Monteiro Rocha Lima, Thiago Eustaquio Alves de Oliveira, and Vinicius Prado da Fonseca. *Multimodal Tactile Texture Dataset*. Ed. by "Mendeley Data". 2023. DOI: 10.17632/N666TK4MW9.1. URL: https://data.mendeley.com/datasets/n666tk4mw9/1.

[45] Thiago Eustaquio Alves de Oliveira and Vinicius Prado da Fonseca. *BioInTacto: tactile sensing module design files and source code*. Version v1.0.0. Aug. 2022. DOI: 10.5281/zenodo.7011242. URL: https://doi.org/10.5281/zenodo.7011242.

SUPERVISIONS

Since joining MUN in July 2020, I have supervised around 17 students at different levels. Currently, I have one Ph.D. and four Masters ongoing supervisions. My past and current supervision activities are listed below.

Official Supervision Activities

- PhD students
    1. **Masinjila, Ruslan**. Thesis title: "TBD." Sep-2024. Co-supervisor: Thiago E. A de Oliveira.
    2. **Elahe Mohammadreza**. Thesis title: "TBD." Sep-2022. Co-supervisor: Xianta Jiang.
- Masters students
    1. **Soroush Baghernezhad**. Thesis title: "TBD." May-2024. Co-supervisor: Xianta Jiang.
    2. **Sara Ghavvampours**. Thesis title: "TBD." Sep-2024. Co-supervisor: Xianta Jiang.
    3. **Aref Sayareh**. Thesis title: "Data fusion and feature extraction from multisensor data." Jan-2023 to Dec-2024.
    4. **Viral Galaiya**. (Concluded) Thesis title: "Tactile pose estimation in human-like hands." May-2022 to Aug-2024. Co-supervisor: Xianta Jiang.
    5. **Shemonto Das**. (Concluded) Thesis title: "Active Learning Strategies for Event Detection on Time-series Data." Jan-2022 to Apr-2024. Co-supervisor: Amilcar Soares.
    6. **Jordan Noel**. (Concluded) Thesis title: "An Analysis of Teams' Momentum Using Machine Learning." Jan-2022 to Dec 2023. Co-supervisor: Amilcar Soares.
- Honours Thesis
    1. **Devender Singh**. Thesis title: "TBD." Sep-2024. Co-supervisor: Matt Hamilton.
    2. **Sohayib Sazid Fahim**. Thesis title: "TBD." Sep-2024.
    3. **Kristmundur James-Steinsson Hann**. (Concluded) Thesis title: "Designing a GUI for Clinician-Friendly Prosthetic Control and Data Recording." May-2024 to Dec-2024.
    4. **Tahsin Ahmed Prottoy**. (Concluded) Thesis title: "Evaluating Frequency-based Features and Machine Learning Models for Robotic Texture Classification." 1-Jan-2023 to 20-Apr-2023.
    5. **S M Shahriar Jobayer**. (Concluded) Thesis title: "Tactile-based Classification of Textures using Statistical Features and Machine Learning Models." 1-Jan-2023 to 20-Apr-2023.
- Masters students (Course-based project)
    1. **Murad Yousuf**(Concluded) Project title: "VR and EMG for data collection and model training." Sep-2024 to Dec-2024.
    2. **Venkata Naga Sai Siddhartha Danyamraju**. (Concluded) Project title: "Comparing Data Representation Techniques for Tactile Sensing in Texture Classification Tasks." 8-May-2023 to 11-August-2023.
    3. **Iftekhar Hossain Masud**. (Concluded) Project title: "Tunning and feature selection for tactile sensing dataset of single grasp manipulation experiments." 1-May-2021 to 6-Aug-2021.
    4. **SM Arifuzzaman**. (Concluded) Project title: "Developing a Reinforcement Learning Environment to the MyCobot Robot using PyBullet and OpanAI." 1-May-2021 to 6-Aug-2021.

- Undergraduate students

    1. **Dante Eleutério Santos** (MITACS Globalink program 2024) (Concluded) Project title: "Control and sensing for OMX robot." 1-May-2024 to 24-July-2024.
    2. **Nakul Nibe** (MITACS Globalink program 2023) (Concluded) Project title: "3D Printed Tactile-Enabled Prosthetic Hand Prototype." 15-May-2023 to 9-Aug-2023.
    3. **Kadambari Bhujbal** (MITACS Globalink program 2022) (Concluded) Project title: "Tactile sensing for swarm robots." 15-Jun-2022 to 31-Aug-2022.
    4. **Apurva Acharya** (SURA program) (Concluded) Project title: "Validating tactile surface estimation using Cloud Compare." 2-May-2022 to 31-Aug-2022.
    5. **Yudish Juwaheer** (SURA program) (Concluded) Project title: "PCA Analysis of Tactile Data From the Object Grasp Dataset." 1-May-2021 to 20-Aug-2021.

Mentoring Activities

- MUN

    1. **Issah Nazif Suleiman** (Concluded) Mitacs supervision.
    2. **Igor Cardoso** (Concluded) Exchange research.
    3. **Carlos Gomes** (Concluded) Exchange research.
    4. **Yaksh J. Haranwala**. (Concluded) Development of PTRAIL library. 1-May-2021 to 20-Aug-2021. Co-supervisor: Amilcar Soares.
    5. **Salman Haidri**. (Concluded) Development of PTRAIL library. 1-May-2021 to 20-Aug-2021. Co-supervisor: Amilcar Soares.

- Woman in Science and Engineering - Newfoundland Student Summer Employment Program (WISE SSEP).

    1. **Kennedy Blanchard**. (Concluded) The WISE SSEP promotes high school graduates' insertion into work and academic environments with a paid internship. She received instruction in basic Python programming and data processing techniques used in research. 1-May-2021 to 31-Jul-2021.

My external collaborations also include mentoring students at other institutions.

- University of Ottawa (uOttawa).

    1. **Bruno Monteiro Rocha Lima**. Completed his Master's with works in biomedical engineering and textile classification using tactile sensors.
    2. **Qi Zhu**. Completed his Master's working with anthropomorphic hands.
    3. **Maxwell Welyhorsky**. Finished his Master's working in a neuro-fuzzy controller for underactuated hands.

- Military Institute of Engineering (IME) - Brazil.

    1. **Alexandre dos Santos Boente**. Master student developing methods for sensing and manipulation with previous collaborations in small-scale UAVS and currently working on robotic manipulation tasks.

- Federal University of Paraiba (UFPB) - Brazil.

    1. **Humberto Navarro**. Undergraduate student worked on machine learning and visuotactile data.
    2. **Lucas Pontes Castro**. Undergraduate student worked on machine learning and visuotactile data.

Professional Societies and Memberships

IEEE (Institute of Electrical and Electronics Engineers)

Vice-chair IEEE NL Section 2025-2027.
Secretary IEEE NL Section 2024-2025.
Member 2020-Present.
Student Member 2015-2020.

Conference Organization

IEEE NECEC 2024 Fall 2023.

The IEEE Newfoundland and Labrador Electrical and Computer Engineering Conference (NECEC) is an annual event showcasing advancements in electrical, electronic, and computer engineering.

Computer Science Forum Winter 2023.

The CS forum is hosted by the CS graduate students twice a year. It is an opportunity for graduate and honors thesis students to present their research work.

IEEE Xtreme 2022.

I assisted in the 24-hour competition held by the IEEE St. John's branch of the IEEE Xtreme competition.

Scientific Endeavours in Academia Conference - SEA 2022.

Poster competition judge
Judge the poster competition in the Faculty of Science first annual Scientific Endeavours in Academia interdisciplinary research conference - SEA.

Invited Talks

I have recently been invited to give lectures and discussions in the following opportunities:

1. Keynote: "Leveraging Time-Series Data Analysis for Classification, Fault Detection, and Sensor Fusion in Smart Industries." Big Data Conference, Linnaeus University September 2024. Växjö, Sweden.
2. "Using ML/RL to develop visual and tactile sensing for the next generation of assistant devices and smart prosthesis." Linnaeus University February 2024. Växjö, Sweden.
3. "Sensores Táteis e Manipulação Robótica." Federal Institute of Pará (IFPA). June 2023. Parauapebas, Brazil.
4. Round table discussions about research opportunities in the Estate University of the Tocantins Region (UEMASUL). August 2023. Imperatriz, Brazil.
5. "Organization, planning and work-life balance." Summer Program for Undergraduate Research in Computer Science (SPURCS). June 2023. St John's, Canada.
6. "Using machine learning models to extract object information from visual and tactile data during robotic manipulation." AutonoMUN 2022. August 2022. St John's, Canada.
7. "Neuro-Fuzzy Grasp Control for a Teleoperated Five Finger Anthropomorphic Robotic Hand." 16th Annual IEEE International Systems Conference (IEEE Syscon). April 2022. Montreal, Canada.
8. "Evaluating Data Representations for Object Recognition During Pick-and-Place Manipulation Tasks." 16th Annual IEEE International Systems Conference (IEEE Syscon). April 2022. Montreal, Canada.

9. "Classification of Textures Using a Tactile-Enabled Finger in Dynamic Exploration Tasks." IEEE SENSORS. October 2021. Sydney, Australia.

10. "Aprendizado de Máquina e Manipulação Robótica." XIV Academic Week Computer Science. November 2021. Palmas, Brazil.

11. "Machine Learning for Robotic Dexterous Manipulation." AI eSymposium. October 2020. St John's, Canada.

Review Service

NFRF Exploration Competition
Mitacs Accelerate
IEEE Sensors Journal
Elsevier Expert Systems With Applications
MDPI Applied Sciences
MDPI Biomimetics

Department of Computer Science Committees

Promotion & Tenure Committee (Sep23 - Apr24)

As a member, I contributed to reviewing and evaluating tenure and promotion applications, ensuring a thorough and fair assessment process.

Search Committee - Tenure-track Positions (Dec22 - Mar23)

In this search committee, we were responsible for selecting one candidate for a tenure-track position. We evaluated 12 candidates and interviewed a short list of 3.

Search Committee - Teaching Term Positions (Mar23 - Jun23)

In this search committee, we were responsible for selecting three candidates for a 3-year contract teaching position. We evaluated 11 candidates and interviewed a short list of 6.

Graduate Studies Committee (Sep20 -)

Computer Science department committee for graduate programs. Evaluate new courses applications, two new graduate programs, changes in the course-based/co-op Masters programs.

Graduate Studies Admissions Committee (Sep21 - Apr22)

Evaluating a large number of candidates applying for the PhD and Masters programs.

Ph.D. Thesis Examiner

1. **Dalia Ibrahim** (Comprehensive exam) "Scalar Field Guidance in Swarms of Simple Robots." April 2023. Dr. Andrew Vardy (Supervisor).

2. **Majid Afshar Noghondari** "Large-Scale Dimensionality Reduction Using Perturbation Theory and Singular Vectors." July 2021. Dr. Saeed Samet (CoSupervisor) and Dr. Hamid Usefi (Co-Supervisor).

3. **Ryan Zier-Vogel** "TopAffy: Predicting transcription factors DNA-binding specificities using a general topological method." August 2021. Dr. Lourdes Pena-Castillo (Supervisor).

M.Sc. Thesis Examiner

1. **Mohammad Asfour** "Machine Learning and Processing Techniques for the Enhancement of Hand Gesture Recognition of Forcemyography and Electromyography Signals." November 2023. Dr. Xianta Jiang (Supervisor).
2. **Robert Bishop** "Human Achievable Path Generation in Video Games Through Modified Heuristic Search." January 2023. Dr. David Churchill (Supervisor)
3. **Arnab Barua** "Investigating Effects of Window Length on 1D-CNN-LSTM and Effectiveness of Heuristic Features in Solving Sensor Orientation and Placement Problems in Human Activity Recognition Using a Single Smartphone Accelerometer." May 2023. Dr. Xianta Jiang (Supervisor) and Dr. Daniel Fuller (Co-Supervisor).

Ph.D. Thesis Chair

1. **Uyen Dao** "Operational Risk Assessment of Oil and Gas Pipelines Subjected to Internal Corrosion." May 2023. Dr. Faisal Khan (Supervisor), Dr. Yahui Zhang (Co-Supervisor), and Dr. Zaman Sajid (Co-Supervisor).
2. **Hondanaidelage Fernando** "Range Assisted Inertial Navigation System for Multi-Rotor Micro Aerial Vehicles." August 2022. Dr. George Mann (Co-Supervisor), Dr. Oscar De Silva (Co-Supervisor), and Dr. Raymond Gosine (Co-Supervisor).

External Thesis Committees

1. **Isura Thrikawala** "Surface Estimation from Multi-modal Tactile Data." October 2021. Dr. Thiago Eustaquio Alves de Oliveira (Supervisor).
2. **Gabriel Teixeira Patrício** "Engenharia de Atributos para Reconhecimento de Padrões em Times de Futebol." December 2021. Dr. Leonardo Vidal Batista (Supervisor).
3. **Alexandre dos Santos Boente** (Proposal) "Robô de resgate articulado com sensor háptico em uma plataforma móvel." July 2021. Dr. Paulo Fernando Ferreira Rosa (Supervisor).

Complementary Formation

Parallel Programming with OpenCL e OpenACC. 2013.
- Hours: 12h
- Local: National Laboratory of Scientific Computing, 2013

Languages

- English - Understands Well, Speaks Well, Reads Well, Writes Well.
- Portuguese - Native.

Softwares and Hardware Skills

Programming Languages:
- C, C++, Python, Java, C#, UNIX shell scripting, JavaScript, SQL, Matlab, Octave, R.
- ROS (Robot Operating System)
- Arduino Platform, Raspberry Pi platform.
- Git version control system.

CAD and Design:
- Solidworks, FreeCAD, Eagle (PCB design).

Computer Networking:
- Networks (UDP, TCP, ARP, DNS, Dynamic routing), Linux Servers (Apache, SQL, POP, IMAP, SMTP), i2c, USB-serial.
- Wireless Networks (XBee, ZigBee radio modules).

Productivity:

- TEX (LATEX, BIBTEX).
- Libre/MS Office Suites.
- GIMP, Inkscape.

Operating Systems:

- Linux, Microsoft Windows, BSD, e other Unix variants.

References Available to Contact

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  - ⋆ *Professor Petriu was my PhD advisor.*

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