

# JINANI SOORIYAARACHCHI

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## OBJECTIVE

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Final-year PhD candidate (graduating in December 2024) with extensive training and experience in computational neuroscience and machine learning. Proficient in communicating effectively with technical and non-technical audiences. Passionate and well-experienced in neural data analysis and developing brain-computer interface (BCI) applications.

## EDUCATION

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**PhD - Computational Neuroscience and Machine Learning** 2021/09 - 2024/12

Department of Physiology-McGill University, Canada - GPA: 4.0/4.0

- Thesis: A machine learning approach to model cortical state effects on early visual cortex neurons.
- Scientific presentations: 6 oral presentations, 5 international presentations, 11 national presentations
- Awards: 5 fellowships and 3 best presentation awards, 1 hackathon

**Deep Learning Interactive Training - Neuromatch Academy** 2022/07 - 2022/08

- Project: A model-to-brain mapping : DNNs in modeling the ventral visual pathway

**MSc in Physiology (Thesis)- Fast-tracked to PhD** 2020/09 - 2021/08

Department of Physiology-McGill University, Canada - GPA: 4.0/4.0

**BSc. Engineering (Hons)- Biomedical Engineering** 2014/12 - 2018/12

University of Moratuwa, Sri Lanka - GPA: 3.94/4.2 (First Class and Dean's List 8/8 semesters)

- Final year project: A machine learning model to predict non-invasive blood glucose levels.

## SKILLS

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**Programming:** Advanced level in Python and Matlab (data analysis and visualization), conda, git

**Machine Learning:** Advanced level in regression, clustering, dimensionality reduction, neural nets, deep learning and transfer learning using Tensorflow, Keras, Scikit-Learn, PyTorch libraries

**Bio-signal processing:** Electrophysiology, EEG, EMG and ECG data acquisition and processing

**Research Skills:** Data acquisition, Data analysis and visualization, Statistical analysis, Neurophysiology techniques, Participant recruitment and screening, Ethics applications, Scientific communications

**Operating Systems:** Linux, Windows, Mac

**Project Management and Leadership Skills:** Leading and mentoring multidisciplinary teams of biomedical engineers and computer scientists.

## PUBLICATIONS

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[1]. **J. Sooriyaarachchi**, S. Seneviratne, K. Thilakarathna and A. Y. Zomaya, "MusicID: A Brainwave-based User Authentication System for Internet of Things," in IEEE Internet of Things Journal [Link]

[2]. **Jinani Sooriyaarachchi**, Changan Zhan, Curtis L. Baker Jr., "Cortical state contributions to response variability in the early visual cortex: A system identification approach", doi: <https://doi.org/10.1101/2024.09.17.613530> [Link]

[3]. Nguyen P, **Sooriyaarachchi J**, Huang Q, Baker CL Jr (2024) "Estimating receptive fields of simple and complex cells in early visual cortex: A convolutional neural network model with parameterized rectification". PLOS Computational Biology 20(5): e1012127 (\*shared first author) [Link]

[4]. K. D. Pathirage, P. Roopasinghe, **J.J. Sooriyaarachchi**, R. Weththasinghe and N. D. Nanayakkara, "Removing subject dependencies on Non-Invasive Blood Glucose Measurement using Hybrid Techniques," 2019 41st Annual International Conference of the IEEE EMBC [Link]

## WORK EXPERIENCE

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**Consultant - Neuro-AI: AAVAA, Montreal, Canada** 2022/12 - 2023/03

- Developed an approach to denoise EEG with a higher accuracy in a commercial-grade BCI device.
- Implemented an UMAP and Louvain clustering algorithm to cluster eye blinks in a BCI application.
- Implemented an algorithm to calibrate and standardize eye blink signals extracted from EEG.

**Research Assistant: Center for Biomedical Innovation, Sri Lanka** 2020/01 - 2020/09

- Developed an IMU Based gait analysis system (Matlab and ShimmerIMU-based).
- Conducted experiments and gait analysis with scoliosis patients and the national cricket team.
- Managed a multidisciplinary project team, recruited and trained research employees.

**Senior Executive - Software Engineer: Axiata Digital Labs, Sri Lanka** 2019/01 - 2019/10

- Developed and installed a server monitoring/alarming system at CAT telecom-Thailand.
- Developed a system to authenticate users purchasing SIM cards at Dialog telecom-Sri Lanka.
- Collaborated with CAT telecom-Thailand and Huawei-China.

**Research Trainee: DATA61-CSIRO, Australia** 2017/08 - 2018/01

- Developed a machine learning-based biometric authentication system using music-induced EEG.
- Wrote and managed the ethics approval for collecting EEG from human subjects.
- Managed time to deliver a successful authentication system in less than six months and presented and published the research in IEEE-Internet of Things journal.

## HONOURS AND AWARDS

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[1]. **2024 NeuroSphere Neurotech Hackathon Challenge Award** 2024/11

Awarding organization: NeuroSphere-HBHL [3000CAD]

[2]. **Fonds de recherche du Québec – Santé (FRQS) doctoral fellowship** 2022/06 - 2026/06

Awarding organization: Fonds de recherche du Québec, Canada [84000CAD]

[3]. **Best poster presentation - Physiology graduate research day** 2024 and 2021

Awarding organization: Department of Physiology, McGill University [50CAD]

[4]. **The Applied AI Institute Award for best presentation-MAIN22** 2022/12

Awarding organization: The Applied AI Institute, Canada [400CAD]

[5]. **Faculty of Medicine and Health Sciences Internal Fellowship** 2022/09 - 2023/09

Awarding organization: Faculty of Medicine, McGill University [12000CAD] -Declined

[6]. **Max E. and Jane K. Childress Entrance Fellowships in Physiology** 2021/09 - 2022/09

Awarding organization: Department of Physiology, McGill University [38000CAD]

[7]. **Max Stern Recruitment Fellowship in Physiology** 2020/09 - 2021/09

Awarding organization: Department of Physiology, McGill University [27000CAD]

[8]. **Runners up in IEEE-WIE-Robotics Competition** 2016/09

Awarding organization: University of Moratuwa, Sri Lanka

## LEADERSHIP

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**McGill University, Canada**

- Mentor - Scientista Program 2024

**University of Moratuwa, Sri Lanka**

- Control Board External Relations Manager, AIESEC Colombo-South 2016

- Department Representative, Biomedical Engineering 2015

## VOLUNTEERING

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**Project CEAD-Malaysia** 2015

- Volunteer at University Science Malaysia under AIESEC exchange program

**Project HODIYA-Sri Lanka** 2016

- Project manager: Recruit, train and lead international AIESEC volunteers.