

Cespedes Tenorio MAURICIO

Electrical Engineer | Signal Processing & Machine Learning

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Master of Engineering Science candidate at Western University, holding a BEng in electrical and computer engineering. Pursuing my graduate degree in biomedical engineering, with a special focus on machine learning for image and signal processing. Enrolled in a machine learning specialization as part of the master's program. Actively engaged in diverse machine learning projects during the master's program, emphasizing image processing, LLMs, and signal processing, alongside software development initiatives. With 1.5 years of industry experience in software testing and development gained at Boston Scientific.

EDUCATION

Current Sept 2022	Master of Engineering Science in Biomedical Engineering The University of Western Ontario <ul style="list-style-type: none">➤ Anticipated graduation : Sept 2024.➤ Specialization : Machine Learning.➤ Master's Thesis : An open pipeline for the analysis of recordings from intracranial electroencephalography.	📍 London, ON, Canada
March 2017 July 2021	Bachelor of Engineering in Electrical Engineering University of Costa Rica <ul style="list-style-type: none">➤ Grade Average : 9.63➤ Graduation project : Control algorithm for imaging-guided photothermal therapy : mathematical modeling, design and simulation.	📍 San Jose, Costa Rica

RELEVANT RESEARCH EXPERIENCE

Current Aug 2022	Graduate MESC Student Khan Computational Imaging Lab, The University of Western Ontario <ul style="list-style-type: none">➤ Developing tools for preprocessing of intracranial electroencephalography recordings using signal processing techniques.➤ Developing an automatic classifier for intracranial EEG signals using deep learning (CNNs and RNNs) and traditional machine learning techniques (XGBoosting and Random Forests).➤ Collaborating in projects related to medical image processing using machine learning, including the automatic segmentation of intracranial EEG electrodes.➤ Involved with SW development projects in Python, such as Ciftipy and SlicerNeuro. <div>Python Signal Processing Machine Learning Linux Pytorch Keras sklearn</div>	📍 London, ON, Canada
July 2020 Aug 2021	Research Assistant Biomedical Engineering Research Lab, UCR <ul style="list-style-type: none">➤ Simulated systems involving photoacoustic imaging and ablation systems for cancer treatment.➤ Developed simulated control systems for the optimization of ablation cancer therapies along with photoacoustic imaging. <div>MATLAB Python Mathematical Simulations</div>	📍 San Jose, Costa Rica

WORK EXPERIENCE

Current Sept 2022	Software/Hardware Technician Robarts Research Institute Relevant responsibilities : <ul style="list-style-type: none">➤ Preparing scenes in 3D Slicer for their use in Virtual Reality.➤ Setting up and troubleshooting of VR equipment and SlicerVR. <div>Python 3D Slicer 3D Slicer Development</div>	📍 London, ON, Canada
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Aug 2022
Sept 2021

R&D Software Test Engineer I

Boston Scientific

📍 Heredia, Costa Rica

Relevant responsibilities :

- Worked with a cardiac electrophysiology mapping system called Rhythmia Mapping System.
- Executed and developed manual and automated tests for software systems and tools.
- Worked closely to the Concepts team, responsible for the development of the signal processing algorithms for the Rhythmia Mapping System, to create manual and automated tests that covered relevant clinical cases.
- Developed a side project for the neuromodulation R&D team at Boston Scientific for the automatic testing of neuromodulation signals using Python and signal processing.

Python Cardiac Electrophysiology Linux Bash

Sept 2021
March 2021

R&D Software Test Engineer Intern

Boston Scientific

📍 Heredia, Costa Rica

Relevant responsibilities :

- Received training related to cardiac electrophysiology, cardiac mapping and software tools like Squish, Bitbucket and Jira.
- Executed manual, automated and sanity testing for several software tools.

SW Testing Cardiac Electrophysiology Python

PUBLICATIONS AND CONFERENCES

JOURNAL ARTICLES

Tissue damage-tracking control system for image-guided photothermal therapy of cancer

Mauricio Céspedes Tenorio, Carlos A. Wattson Sánchez, Diego S. Dumani

Frontiers in Thermal Engineering 2 (2022). 2022

CONFERENCE PROCEEDINGS

Modeling thermometry image perturbations during photoacoustic imaging-guided photothermal therapy

Mauricio Céspedes Tenorio, Diego S. Dumani

2021 IEEE UFFC Latin America Ultrasonics Symposium (LAUS), 2021

Multivariable Fuzzy Logic Controlled Photothermal Therapy

Mauricio Céspedes Tenorio, Diego S. Dumani

IFAC-PapersOnLine 54.15 (2021) p. 400-405. 2021

Multivariable fuzzy logic controlled photothermal therapy

Mauricio Céspedes Tenorio, Diego Dumani Jarquín

Ingeniería 31 (déc. 2020) p. 35+. 2020

LANGUAGES

English Professional proficiency.
Spanish Native proficiency.

TECHNICAL SKILLS

Programming Python (Pandas, Scipy, Numpy, Xarray, etc.), C/C++, MATLAB.
Signal Processing Spectral analysis, digital filters, etc.
Machine Learning Theory and coding : Scikit-learn, Pytorch, Pytorch Lightning, Keras, MONAI, Langchain.
Miscellaneous Linux, Bash, Markdown, Git/Github, Docker, Singularity, Poetry.

REFERENCES

Dr. Ali Khan

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