Cespedes Tenorio **MAURICIO**

Electrical Engineer | Signal Processing & Machine Learning

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Biomedical engineering MESc candidate at Western University, with a BEng in electrical engineering. Fascinated by the fields of signal processing, image processing and machine learning, especially their application to biomedical sciences. With experience in the medical industry thanks to my previous job at Boston Scientific. Currently pursuing a specialization in machine learning as part of my master's program.

Education

Current – Sept 2022 | London, ON, Canada

Master of Engineering Science in Biomedical Engineering

The University of Western Ontario

- **Anticipated graduation :** Sept 2023.
- **Master's Thesis :** An open pipeline for the analysis of recordings from intracranial electroencephalography.

March 2017 – July 2021 | San Jose, Costa Rica

Bachelor of Engineering in Electrical Engineering

University of Costa Rica

- **Grade Average :** 9.63
- **Graduation project :** Control algorithm for imaging-guided photothermal therapy : mathematical modeling, design and simulation.

Relevant Research Experience

Current – Aug 2022 | London, ON, Canada

Graduate MESc Student

Khan Computational Imaging Lab, The University of Western Ontario

- Developing projects related to preprocessing and analysis of intracranial electroencephalography recordings using signal processing and machine learning.
- Collaborating in projects related to medical image processing using machine learning.

Python | Signal Processing | Machine Learning | Linux

July 2020 – Aug 2021 | San Jose, Costa Rica

Research Assistant

Biomedical Engineering Research Lab, UCR

- Simulated systems involving photoacustic imaging and ablation systems for cancer treatment.
- Developed simulated control systems for the optimization of ablation cancer therapies along with photoacustic imaging.

MATLAB | Python | Mathematical Simulations

Work Experience

Current – Sept 2022 | London, ON, Canada

Software/Hardware Technician

Robarts Research Institute

Relevant responsibilities :

- Preparing scenes in 3D Slicer for their use in Virtual Reality.
- Setting up and troubleshooting of VR equipment and SlicerVR.

Python | 3D Slicer | 3D Slicer Development

Aug 2022
Sept 2021

R&D Software Test Engineer I

Heredia, Costa Rica

Boston Scientific

Relevant responsibilities :

- Worked with a cardiac electrophysiology mapping system called Rhythmia Mapping System.
- Studied important concepts related to cardiac electrophysiology.
- 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

Heredia, Costa Rica

Boston Scientific

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, NumPy, Scipy, Scikit-learn, PyTorch, etc.), C/C++, MATLAB.
Signal Processing	Spectral analysis, digital filters, machine learning, connectivity, etc.
Miscellaneous	Linux, Bash, LaTeX(Overleaf), Markdown, Microsoft Office, Git/Github, Docker.

References

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Eng. Diego Dumani Jarquin, PhD.
Professor and Researcher, University of Costa Rica
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