Roxana Peña Mendieta, CS

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Education

MsC **Université de Montréal**, Master Student in Software Engineering — Sept 2025 – Aug 2027

BC **University of Havana**, Computer Science — Sept 2019 – Jan 2024

Research Experience

Master Research Student at UdeM — Sept, 2025

- I started my research topic in Preservation of Digital art in software-based code.
- Presenting "AI for analyzing the evolution of code for digital arts" for the IVADO Digital Futures event on Oct 22.

Using Freeman's curve encoding for the entropic analysis of trajectories — July 29 - August 2, 2024

- Presented at the XLIV Dynamics Days Europe 2024 event in Bremen, Germany.
- Poster presentation of thesis results, represented by M.Sc. Ania Mesa.

Thesis: "Entropic analysis of two- and three-dimensional shapes and trajectories". — Feb 2023 - Dec 2023

- Computational Mathematics, related to Information Theory (Probabilities and Statistics).
- It proposes an entropic meter analysis methodology applied to different real data sets with the objective of achieving segmentation and interpreting the results obtained.
- It relies on concepts such as string code, Freeman code, Shannon entropy, entropy density, excess entropy, Lempel-Ziv distance and fractal dimension.
- Discretization and encoding of 2D and 3D motion data.
- Parameter optimization (optimal grid size).
- Training of a neural network with input quantities.
- **Technologies used:** Python, Latex

Study of the projection of visual stimuli in the visual cortex: retinotopic mapping. — Mar 2023

- Presentation of work at the Scientific Event of the Faculty of Mathematics and Computer Science.
- A review was conducted through the monopole, dipole, and wedge-dipole maps.

Professional Experience

Full Stack Developer: FI Group, Spain (Remote) Feb 2024– Aug 2025

- Attended daily meetings, weekly scrum meetings and sprint review meetings.
- Experienced in developing web projects, with hands-on expertise in both frontend and backend functionalities.
- Resolved client-reported production bugs effectively, even in high-pressure situations.
- **Technologies and environment used:** C#, .Net Core, React.js + TypeScript, Microsoft SQL Server, MySQL, HTML, CSS, Visual Studio, SQL Server Management Studio, Microsoft Azure Storage Emulator, Azure DevOps.

Teacher Assistant for the Computer Architecture course in the third year (2022)

- **Technologies used:** Logisim

Courses Projects

Distributed Search Engine (Jun 2023 - Jul 2023)

- Design and implementation of a distributed Python search engine with a CHORD-based peer-to-peer network, utilizing a Publisher/Subscriber architecture. Deployed with Docker for efficient fault handling and node organization in a ring topology. distributed-search-engine
- **Technologies used:** Python, Docker, Vue, JavaScript, nltk, fastApi,

Medical Knowledge Discoverer (May 2023 - Jun 2023)

- Design and implementation of a machine learning pipeline for knowledge discovery in medical documents using transformer-based models (BERT, T5, GPT-3) on the e-health-kd dataset (English and Spanish). Tackled NER and RE tasks, evaluating performance with precision, recall, and F1 metrics. Included ontology implementation to enhance data interpretation. medical-knowledge-discoverer
- **Technologies used:** Jupyter Notebook, Python, Neural Networks, TensorFlow, PyTorch, Spacy, Neo4j

VRP with Rmayor (Nov 2022 - Jan 2023)

- Design and implementation of a simulation system for vehicle routing in urban environments, including heuristic and metaheuristic algorithms. Developed a DSL with LALR grammar for vehicle routing problem-solving, incorporating A*, AI planning and ant colony methods (A.C.O.) to optimize routes and meet customer demands efficiently. VRP-with-Rmayor
- **Technologies used:** Python, ply, nltk

Information Retrieval Model (Nov 2022 - Dec 2022)

- Design, implementation and analysis of three information retrieval models: Boolean, Vector and Latent Semantic Indexing (L.S.I.). ir-system
- **Technologies used:** Python, Django, HTML, nltk, sympy

University Services

- Participation in the 'Caribbean Games', annual university sports games, competing in: athletics (100 meters, 200 meters, 4x100m, 4x400m), swimming, water polo, baseball 5, frontenis, volleyball, futsal, softball, rhythmic gymnastics; winning a gold medal in baseball 5, and a bronze medal in water polo and swimming 4x100m and 4x50m. — 2019 - 2024
- Participation in Cultural Festivals, performing comedy monologues. — 2022 - 2023
- Position in the FEU (University Student Federation) as Head of Sports for two consecutive years. — 2021 - 2023
- Participation in university activities, including assisting in the organization of a science fair for prospective students and engaging in volunteer efforts such as street clean-up after Hurricane Ian and campus cleanup initiatives. — 2019 and 2022

Languages

Spanish: Native Proficiency

English: Professional Working Proficiency. **Certifications:** IELTS Overall Band Score: 6.5, CEFR Level: B2 (2024)

French: Currently in the French Twinning Program at UdeM (A2)