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Awards

Industrial University of Santander, Colombia – *Meritorious Undergraduate Thesis*

Awarded for a distinguished undergraduate thesis on *A Self-Supervised Deep Riemannian Representation to Classify Parkinsonian Fixational Patterns*, which led to a [published paper](#) in a Q1 journal. This research introduced a novel self-supervised architecture that uses SPD matrices to classify eye fixation patterns associated with Parkinson's Disease, achieving an accuracy of 92.3% and an AUC of 95% in binary classification tasks. This work highlighted innovation in self-supervised learning and Riemannian geometry, contributing significantly to digital biomarkers for Parkinson's without relying on expert-labeled data

Industrial University of Santander, Colombia – *Best speaker on science event*

Awarded for an outstanding presentation on behalf of a fellow mathematician's undergraduate thesis, which explored the application of Symmetric Positive Definite (SPD) matrices within Riemannian manifolds to classify Parkinsonian patterns from gait analysis videos. The award recognized both the innovative nature of the method—leveraging Riemannian geometry for non-linear data in medical diagnostics—and the speaker's ability to clearly communicate complex mathematical concepts to a panel of field experts. This achievement underscored a commitment to advancing digital biomarkers for Parkinson's Disease through interdisciplinary approaches.

Education

2024 January - TODAY

Industrial University of Santander, Colombia – *Master's in Systems and Computer Engineering*

- Lead the implementation of advanced techniques for the classification and malignancy stratification of prostate lesions using MRI sequences.
- Studied and adapted state-of-the-art methods in the field of artificial intelligence applied to oncology, integrating my own innovations to improve model performance.
- Documented each stage of the process to facilitate the writing of scientific articles, contributing to the knowledge and advancements in prostate cancer classification.
- Used Matlab or Python with libraries such as PyTorch, TensorFlow, scikit-learn, Plotly, and NumPy; manage dependencies and deployments with Docker; utilize Git for version control and Zotero for reference management, all in a Linux environment.

- The most significant advancement so far is the development of unsupervised representations for binary classification of malignancy in prostate lesions.

2018 January - 2023 September

Industrial University of Santander, Colombia – *Bachelor of Science in Computer Science*
(GPA: 4.45/5)

- Developed strong problem-solving skills through various programming courses, focusing on solving coding problems efficiently and writing functional, optimized code in languages such as MATLAB, R, Python, C#, Java, and C++.
- Managed a team of four students in multiple group projects, coordinating tasks, setting deadlines, and maintaining project quality. Regularly led feedback sessions to discuss performance and identify areas for improvement, fostering a collaborative environment and honing skills in constructive communication and team development.

Work Experience

2023 June - 2024 June

Tecnologica FITEC, Colombia – *Artificial Intelligence Consultant*

- Guided teaching professors and administrative staff in the effective use of AI tools to enhance teaching and administrative tasks.
- Conducted workshops and training sessions to improve AI literacy and integration across the university.
- Collaborated with a multidisciplinary team to develop a subject-specific chatbot, using common OpenAI APIs to assist students with frequently asked questions and subject resources.
- Ensured high accuracy by fine-tuning the chatbot model with quality data, revising datasets to improve intent recognition and response relevance across different subjects.
- Enhanced cross-functional teamwork and practical application of NLP in an educational context.

2022 June - 2024 June

Industrial University of Santander, Colombia – *Machine Learning Engineer*

- Collaboration with researchers to understand and adapt state-of-the-art methods (on hugging face), ensuring their proper functioning in isolated environments and their integration into the project.
- Interacted with lead developers to coordinate the integration of isolated models within the project's infrastructure in JavaScript/TypeScript..
- Developed and managed Docker containers to ensure that AI models communicate appropriately with the project's infrastructure.
- Used Python and relevant libraries (PyTorch, TensorFlow, scikit-learn, Plotly, NumPy, FastAPI) for model development and tuning.
- Employed Docker for containerization and Git for version control, all within a Linux environment.

2022 February - 2023 September

Industrial University of Santander, Colombia – *Research Scientist*

- Led the implementation of advanced techniques for Parkinson's classification using eye-tracking video sequences.
- Studied and adapted state-of-the-art methods in the field of artificial intelligence applied to image processing, integrating my own innovations to circumvent challenges inherent in the medical environment.
- Python and MATLAB was employed with libraries such as PyTorch, TensorFlow, scikit-learn, matplotlib, Plotly, and NumPy; I managed dependencies and deployments with Docker; utilized Git for version control and Zotero for reference management, all within a Linux environment.
- The potential impact of the project lies in the study of oculomotor patterns as a potential biomarker for Parkinson's and the possibility of learning discriminative representations without the need for medical labels.

2021 February - 2022 September

Industrial University of Santander, Colombia – *Research Scientist*

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Skills

Programming Languages: Python, R, MATLAB, SQL, C#, JavaScript, Java, TypeScript, C++.

Machine Learning Frameworks: PyTorch, TensorFlow, scikit-learn, hugging face.

Development Tools: Docker, Git, Linux, FastAPI, Flask, Django.

Others: Plotly, machine learning models validation, NLP, computer vision.

Languages

Spanish – *Native*

English – *Advanced*