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Juan Vásquez

I. EDUCATION

University of Colorado Boulder . . . . . **August 2023 – Present**
Ph.D. in Computer Science, Focus: Neurosymbolic and Conversational AI

National Autonomous University of Mexico . . . . . **August 2021 – May 2023**
MS. in Computer Science, Focus: Natural Language Processing

Ibero-American University . . . . . **January 2015 – December 2019**
B.S. in Engineering Physics

II. EXPERIENCE

Conversational Agent Consultant . . . . . **December 2023 – Present**
Neurona — Mexico City, Mexico

- Collaborated with legal professionals to develop and implement a comprehensive knowledge base of victim support protocols, focusing on restorative justice and trauma-informed principles.
- Developed a chatbot powered by the Llama3.3 language model to provide 24/7 support and guidance to workplace violence survivors, offering confidential assistance and resource connections.
- Engineered and deployed a custom Retrieval-Augmented Generation (RAG) pipeline that significantly enhanced the model performance by integrating the knowledge base during inference.

Graduate Researcher . . . . . **August 2023 – Present**
University of Colorado Boulder — Boulder, USA

- Parsed a natural language *corpus* using an Abstract Meaning Representation (AMR) tool, to generate semantic representations of the documents.
- Trained various Graph Neural Networks (GNNs) with the AMRs.
- Proposed a novel neurosymbolic architecture that combines AMR features with GNNs to improve interpretability in unsupervised text classification tasks.

NLP Consultant . . . . . **March 2023 – August 2023**
University of Arizona — Mexico City, Mexico

- Wrote and deployed a suite of Python scripts for text data preprocessing.
- Performed and evaluated various text classification experiments on a *corpus* of crime-related news from Honduras, El Salvador, and Guatemala, including finetuning a BERT multilingual model.
- Authored and published a peer-reviewed research paper analyzing the results of the text classification methodologies.

Software Developer . . . . . **January 2021 – August 2021**
Abiogenesis Project

- Led the technical development of *Abiogenesis*, an AI-powered art installation that transformed a physical painting into dynamic digital experiences, implementing custom computer vision algorithms to detect and manipulate artistic elements in real-time.
- Directed the creation of a specialized training dataset through careful supervision of manual image annotation processes, resulting in a robust object detection model tailored to artistic content.
- Implemented an image processing algorithm that dynamically altered the visual properties of detected objects, creating an interactive installation that seamlessly blended traditional art with AI-driven transformations.

III. SKILLS

- Programming languages: Python, C++, Java, Bash, Julia.
- Tools: Git, GitHub, VS Code, Jupyter, HPC clusters.
- Libraries and Frameworks: HuggingFace, PyTorch, Geometric, scikit-learn, NLTK, SpaCy, Pandas, Polars, NumPy, Matplotlib, Seaborn, gradio, modal, wandb, transformers.
- Spoken languages: Spanish (native), English (advanced), French (intermediate).

IV. OTHER

- Attended various international AI and machine learning schools (2023 ESSLLI, 2023 Lisbon Machine Learning School, Caltech's 2021 summer school on neurosymbolic AI.)
- Authored three first-author papers, and collaborated on seven papers that have been published at various NLP venues.
- Collaborated on the organization of three international shared tasks aimed at improving LGBTQ+-phobia detection in texts in Mexican Spanish.
- First place in the 2021 Rest-Mex shared task co-located at the Iberian Languages Evaluation Forum (IberLef), Málaga, Spain.