JOSEPH MARTINEZ

 josephmars | jmart130@odu.edu | (757) 987-4351 | josephmars.github.io

PROFESSIONAL SUMMARY

Research Assistant with **4 years of experience** in Machine Learning, and Natural Language Processing. Proficient in training **LLMs,** Machine Learning algorithms, and building Simulation models. Strong communication skills through professional engagements. Proven ability in programming and large-scale data analytics to derive **valuable insights**. Collaborative team member with a track record of **successful collaboration** on international research projects.

SKILLS

NLP: scikit-learn, Transformers, spaCy, Hugging Face, OpenAI GPTs   **Deep Learning:** Pytorch, Keras, ANN
Machine Learning: Classification, Regression, Clustering, PCA, NumPy   **Data Analysis:** Python, Pandas, R, SQL
Data Visualization: Tableau, Power BI, R Shiny   **DevOps:** Git, GitHub, Docker

PROFESSIONAL EXPERIENCE

Aaru, Inc   New York City, NY
AI Software Developer   July 2024 – Present
• Improved the performance of multi-agent Large Language Model systems by designing and implementing advanced algorithms for task coordination, communication efficiency, and decision-making in complex Agent-Based Simulation environments.
• Designed simulation environments integrating survey and historical data to model political and business scenarios, enabling the generation of actionable insights and predictive analytics.
• Conducted innovative research in machine learning and Natural Language Processing while collaborating with interdisciplinary teams to develop innovative AI-driven solutions for real-world challenges.

Virginia Modeling, Analysis, & Simulation Center (VMASC)   Suffolk, VA
Graduate Research Assistant   Sep 2022 – Present
• Trained the Large Language Model (LLM) GPT-3.5's to create ABM Simulation models, by improving its ability to generate NetLogo interface and procedural code elements through few-shot prompting.
• Developed a conversational Chatbot expert in a custom domain enhancing answer fidelity by 90% by fine-tuning the LLM Llama2 7B on a dataset of 330 news articles.
• Trained and fine-tuned Machine Learning classification models (RFC, ANN, and BERT) to identify types of frustration in textual data, achieving an average accuracy of 70%.
• Designed and maintained detailed documentation of models, algorithms, and reports on GitHub repositories.
• Presented poster at a research conference in Pittsburgh, and attended others in Arlington, VA, and Oxford, OH.

University of Agder (UiA)   Kristiansand, Norway
Exchange Researcher   Oct 2024 – Nov 2024
• Conducted a joint research project with historians and AI researchers to analyze historical and cultural components of Norwegian identity in the public sphere.
• Utilized NER and LLMs to extract and analyze historical references from Norwegian newspapers, identifying patterns in cultural representation and omissions.

Old Dominion University   Norfolk, VA
Social Media Data Analyst (Consultant)   Jul 2021 – Jan 2022
• Geolocated, filtered, and estimated the tone of **7.3 million Tweets** through fine-tuning fifteen NLP models (spaCy, BERT, RoBERTa) and Statistical Analysis. Models were highly reliable, with a mean accuracy of 72%.
• Extracted, cleaned, and pre-processed **15.5 million Tweets** in multiple languages with Twitter's API and Python.
• Collaborated with teams from Norway, Colombia, Greece, and USA on a $1.4M USD Minerva research initiative.

Universidad del Norte   Barranquilla, Colombia
Social Media Data Analyst (Research Assistant)   Nov 2020 – Jun 2021
• Trained a Natural Language Understanding **(NLU) model** with **IBM Watson** to semi-automate the identification of actors, factors, and relationships from news articles, achieving a final accuracy of 70%.
• Gathered, filtered, and cleaned geo-tagged 4,680 Tweets on migration using Twitter's API and Python.
• Conducted a lexicon-based Sentiment Analysis of Tweets to spot xenophobic trends.

EDUCATION

Old Dominion University   Norfolk, VA
M.Sc. Modeling and Simulation Engineering - GPA: 3.7   Aug 2022 – Dec 2024

Correlation One   New York City, NY
Data Science for All (Bootcamp)   Mar 2022 – Jul 2022

Universidad del Norte   Barranquilla, Colombia
B.Sc. Industrial Engineering - GPA: 3.6   Jan 2017 – Mar 2022

PUBLICATIONS

• **Joseph Martínez**, Brian Llinas, Jhon G. Botello, Jose J. Padilla, and Erika Frydenlund. "Enhancing GPT-3.5's Proficiency in NetLogo through Few-Shot Prompting and Retrieval-Augmented Generation" 2024 Winter Simulation Conference (WSC) IEEE (2024) [Finalist for Best Applied Paper].

• Erika Frydenlund, **Joseph Martínez**, Jose J. Padilla, Katherine Palacio, and David Shuttleworth. "Modeler in a Box: How Can Large Language Models Aid in the Simulation Modeling Process?" SIMULATION (2024).

• Lynch, Christopher J., Erik J. Jensen, Madison H. Munro, Virginia Zamponi, **Joseph Martínez**, Kevin O'Brien, Brandon Feldhaus, Katherine Smith, Ann Marie Reinhold, and Ross Gore. "GPT-4 Generated Narratives of Life Events using a Structured Narrative Prompt: A Validation Study." (2024)

• **Joseph Martínez**, Melissa Miller-Felton, Jose J. Padilla, Erika Frydenlund. "Behind Derogatory Terming for Venezuelan Migrants in Colombia: Xenophobia and Sexism Identification with Twitter Data and NLP" (2023)

• Lauren Guerra, **Joseph Martínez**, and Francisco Pautt. "Design of a User Interface based on Information Engineering and Web Programming for the FUVADIS customer service process." Universidad del Norte (2021).

AWARDS AND ACHIEVEMENTS

International Student Exchange Program
U.S. Department of Defense (DoD)   Oct 2024
· Selected to conduct interdisciplinary AI research the University of Agder, Norway in person

SBP-BRIMS 2023 conference scholarship
SBP-BRiMS Conference chair   Sep 2022

Outstanding results in the Saber Pro 2021 test
Universidad del Norte   Nov 2022
· Best overall institutional score

Graduate Research Assistantship
Virginia Modeling, Analysis and Simulation Center (VMASC)   Jun 2022

Undergraduate Honorable Mention
Universidad del Norte   Mar 2022

Andrés Bello Distinction
Colombian Ministry of Education   Nov 2016
· Distinction to outstanding students in the ICFES Saber 11 State Exam for high school