JACOB QUINTERO

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EDUCATION

University of Arizona 2022-2026
Doctor of Philosophy in Applied Mathematics; *in progress*

Arcadia University 2018-2022
Bachelor of Arts in Mathematics and Computer Science; GPA: 3.63

RESEARCH EXPERIENCE

Natural Language Models January 2023- Present
University of Arizona

- Currently engaged in an NLG project aimed at enhancing the diversity of generated responses. This project builds upon a previous approach that relied on Natural Language Inference (NLI) labels. To achieve this, I am utilizing neural networks to dynamically learn and assign appropriate weights to each NLI label. Additionally, I am incorporating the use of dependency trees and employing tree kernels to identify and leverage structural similarities within the data. This multi-faceted approach is geared towards broadening the range and diversity of responses generated by the NLG system.
- Contributed significantly to a research paper (https://arxiv.org/abs/2310.13290), which focused on enabling transformer models to answer indirect yes or no questions. My key role in this project was extending the system's functionality to include the Spanish language. This involved adapting and fine-tuning the model to effectively handle the nuances of indirect questioning in Spanish, thereby broadening its applicability and impact.

Summer Undergraduate Applied Mathematics Institute June - July 2021
Carnegie Mellon University, *Researcher* *Pittsburgh, PA*

- Conducted research in mathematical finance focusing on the influence of compensation schemes on investor behavior, proved results on expected behaviour given a model.
- Collaborated with a team to gather results and gave daily updates to my project advisor.

EXPERIENCE

Arcadia University, Office of Institutional Research March 2021 - May 2022
Data Visualization Intern *Glenside, PA*

- Use Google Data Studio to visualize data and build dashboards.
- Clean and format the university's data using Excel and Python.
- Visualize complex data sets, draw conclusions and relationships.

Outsmart Insight Ltd. September - December 2020
Data Science Intern *London, United Kingdom*

- Analyzed data from various application programming interfaces to construct machine learning models.
- Collaborated with partners using Bitbucket to write programs in Python for various tasks to manage data including topic extraction with latent dirichlet allocation

TECHNICAL STRENGTHS

- Python and Java
- Transformer models, Hugging Face
- NLP: topic models, language generative models, and sentiment analysis
- GitHub, Bitbucket, Anaconda, Eclipse, and VScode

· Microsoft Office and Google tools including Data Studio
· Fluent in Spanish

TEACHING

Math 107: Understanding Data 2023- Present
Instructor of Record *Tucson, AZ*

· Designed lectures to guide students through elementary statistics and use of technological tools such as Excel
· Emphasized the importance of building a mathematical foundation in terminal math classes, ensuring students developed strong core skills.

Math 112: College Algebra 2022 - 2023
Teaching Assistant *Tucson, AZ*

· Assisted in teaching responsibilities for an entry level algebra course that prepares students for further mathematical studies.
· Held office hours to individually assist students in course material.

Math 116: Business Calculus 2023
Teaching Assistant *Tucson, AZ*

· Assisted in teaching responsibilities for a technical calculus course aimed at Business applications.
· Held office hours to individually assist students in course material.