Antonio Mendoza

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Education

University of North Carolina, Chapel Hill: B.S. in Computer Science; **Early Graduation: August 2021**

- **Relevant Courses:** Machine Learning, Linear Algebra, Databases, Data Analysis, Computational Photography, Algorithms, Bioalgorithms, Calc III, Web Development
- **Education:** aspiring to pursue a **M.S. / Ph.D.** in Multi-Modal Artificial Intelligence (**AI**) 2022

Experience

A.I/ML Researcher (Verisk Analytics) *Summer 2021 - April 2021*

- Scraped over 15 million **visually rich documents (VRD)** online to formulate one of the **largest** document understanding datasets with complete **OCR** information, and sparse annotations
- Publishing a novel **Transformer** architecture for extraction of ungrounded and fragmented information in **VRD**
- Increased accuracy of legal clause identification from fastText embeddings to a **zero-shot** semantic search pipeline using **FAISS** and **HayStack,** using **pre-trained transformer**-based language models.

Machine Learning (ML) Researcher (Mohit Bansal; UNC-NLP Lab) *Fall 2019 - Present*

- Specialization in deep learning multi-modal AI to unify Computer Vision and NLU by working on independent research projects to submit to prestigious machine learning conferences, using **PyTorch**, and many other relevant technologies.
- Investigating (currently) the effectiveness of a homogeneous vision language **transformer-based** architecture based on recent state-of-the-art models: LXMERT and **Google's** VisionTransformer.
- Researched dynamically modular networks via meta-learning to uncover explicit/interpretable reasoning processes.

Deep Learning Open Source Developer *Summer 2020 - Present*

- **First** ever multi-modal model contribution (**LXMERT**) in **Hugging Face** Transformers library; **average 3,500 downloads/month**. Additionally, created a full FRCNN image feature extraction pipeline. (https://bit.ly/3mfORLc)
- Developed instant, **O(1),** access for **N-dimensional** tensors in any **arbitrarily** sized dataset using the Apache Arrow Columnar format in HuggingFace's Datasets library.
- Implementation of LXMERT in **Facebook** multi-modal library (https://bit.ly/2R7YtMN).

Cancer Researcher (The Jackson Laboratory) *Bar Harbor, ME: Summer 2018*

- Identified candidate miRNAs that could be used as circulating biomarkers and/or therapeutic targets in non-small cell lung cancer using PDX mouse models in combination with high throughput sequencing data.
- Automated miRNA alignment through a multi-script pipeline in **R** using a reference database on a **HPC.**

Projects

VLTK (Research & Development framework for prototyping Vision Language models) *Fall 2020 - Present*

- Conference Submission (**EMNLP 2021** system demonstrations) for independently developed Vision Language machine learning library from scratch that significantly aids in research development speed.
- Unifies ALL Vision Language & Computer Vision datasets via adapters to arbitrarily combine datasets together using Apache Arrow columnar data format for zero-cost reads.
- Transpose Vision Language modality iteration which can save over **5X** the time it takes to pass through an epoch.

Natural Language Processing (NLP) with Deep Learning (CS224N) *Spring 2019*

- Visualized word embeddings, recreated the W2V model, and created both an English dependency parser and a ML / AI model (Bi-LSTM with attention) for machine translation.

Hackathons *Spring 2019 - Fall 2020*

- Honorable Mention*,* **Amazon Alexa** Skill International Hackathon**:** developed a Dialog Management study buddy voice assistant application.
- **Best use of (ML)**, HackNC: transfer-learning on a BERT summarization model for real-estate data.
- Creation of web-application, PackHacks: webapp for students to buy/sell college meal-plan swipes.