Vinay **Samuel**

Portfolio | Github | vinaysamuel2003 | vsamuel@andrew.cmu.edu | 713-705-6174

Education

August 2021 – Spring 2025 | **Carnegie Mellon University** | **Pittsburgh, USA**
BS, Statistics and Machine Learning

Relevant Coursework: (PhD) Large Language Models [Current] (PhD) Introduction to Deep Learning [**Python**, **PyTorch**], (PhD) Convex Optimization, (PhD) Advanced Natural Language Processing, Introduction to Machine Learning [**Python**, **PyTorch**], AI Problem Solving and Representation

Skills

Languages and Libraries: Python, Pytorch, Tensorflow, Hugging Face Transformers, Numpy, Pandas, OpenCV, OpenLLM, Keras C++, Java, R

Research: Personalization in LLMs, Question Answering (QA), Multimodal Attribute Value Extraction, NLP, CUDA, LLM Fine-tuning, Prompt Engineering, Collaborative Implementation

Select Experience

Mar 2024 – Present | **Princeton NLP Group** | **Princeton, NJ**
Lead Researcher | Primary Advisor: Prof. Karthik Narasimhan

- Established first ever dynamic evaluation framework for persona agents in LLMs called PersonaGym and introduced new metric for quantifying LLMs' capability to role-play as persona agents termed PersonaScore, demonstrating strong initiative and innovative thinking. [First Author]
- Spearheaded the full implementation of PersonaGym including deciding on various design choices and conducted prompt engineering for determining optimal prompt for the different components of PersonaGym, showcasing leadership and effective time management skills.
- Evaluated 6 open and close source LLMs on 200 diverse personas totaling 10k evaluation questions and benchmarked the average PersonaScore for these models using PersonaGym.

Dec 2023 – Feb 2024 | **University of Illinois Chicago NLP Group** | **Chicago, IL**
Researcher | Primary Advisor: Prof. Cornelia Caragea

- Constructed first ever publicly available dataset for multimodal Implicit Attribute Value Extraction, termed ImplicitAVE, with 68K training data and 1.6K testing data across 5 different domains.
- Spearheaded the benchmarking of 5 state of the art multimodal large language models (MLLMs) on ImplicitAVE. Prompt engineered and conducted hyperparameter search for optimal performance of MLLMs on ImplicitAVE, showcasing leadership in experimental design and execution. [ACL Findings Paper]

Apr 2023 – Aug 2023 | **Independent Research Group** | **Remote**
Lead Researcher | Primary Advisor: Aman Chadha

- Leveraged **GPT-4** to generate 200k+ QA pairs, boosting diversity of training data and for smaller Bert-like LMs [**Hugging Face**] to generalize to out-of-domain questions competing with gold standard human annotated data sets such as SQuAD, demonstrating initiative and creative problem-solving.
- Augmented 4 low resource datasets using GPT4 in order to increase exact match by 5% - 27% and f1 score by 2% - 15% on test datasets of 3 well known low resource datasets. [ACL Student Research Workshop Paper]

Select Research Publications

Complete List at Google Scholar

[C] **ImplicitAVE: An Open-Source Dataset and Multimodal LLMs Benchmark for Implicit Attribute Value Extraction** [Paper] [arXiv] [Code]
Henry Peng Zou, **Vinay Samuel**, Yue Zhou, Weizhi Zhang, Liancheng Fang, Zihe Song, Philip S. Yu, Cornelia Caragea
To Appear in ACL Findings 2024 (Meta Score: 4, Soundness: 4/4/4, Overall: 4/3.5/3.5) [**ACL 2024**]

[C] **Can LLMs Augment Low-Resource Reading Comprehension Datasets? Opportunities and Challenges** [Paper]
Vinay Samuel, Houda Aynaou, Arijit Ghosh Chowdhury, Karthik Venkat Ramanan, Aman Chadha
To Appear in ACL Student Research Workshop 2024 [**ACL SRW 2024**]