JAY PATEL

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Professional Summary

- 3 papers accepted: ACL '24, ICWSM '24, 3 papers in submission: ACL '25, ICWSM '25
- **5+ years** of academic research experience – **Large-scale internet data measurements, NLP (LLM), Social Networks, Statistical methods,** (2019-2021: Computational Game Theory and Evolutionary Computing).
- **3+ years** of industrial work experience – iOS Software Engineer, Full Stack Engineer, UI/UX Designer.
- USAToday (Media Coverage) - Computer vision model to detect Kekistani flag from 1M 4chan images. [Link]

Conference Publications (🍲 - Submitted, ✅ - Accepted)

- 🍲 LLMs for Social Media Content Moderation – ACL ARR '25
  - An explainable framework to detect antisemitism using LLM (Llama 3.1 8B, 70B)
- ✅ **Aya dataset: An ... instruction tuning** (CohereForAI: Open-source contribution) – ACL '24
  - Lead contributor to process and release [513 million]+ data points Huggingface-Aya
- 🍲 **Podcast Outcasts: Understanding Rumble's Podcast Dynamics** – AAAI ICWSM '25
  - Analyzed [13K hours]+ of video content from Youtube & Rumble to understand the political stance using the CLIP model (CLIP + Clustering on video frames)
- ✅ **iDRAMA-scored-2024: A Dataset of the Scored Social Media Platform** – AAAI ICWSM '24
  - Collected, analyzed & released [56 million]+ data points Huggingface-Scored
- ✅ **iDRAMA-rumble-2024: A Dataset of Podcasts from Rumble** – AAAI ICWSM '24
  - Rumble's multimedia data analysis & released [650K]+ data points Huggingface-Rumble
- 🍲 **From HODL to MOON: Understanding … Cryptocurrency Ecosystem**
  - Trained emotion detection RoBERTa model & classified [150 million]+ Reddit posts

Education

Ph.D. candidate, Computer Science, StateUni of NY@Binghamton, NY GPA: 3.80 Aug 2021 - Present
- Advisor: Dr. Jeremy Blackburn

MS-Research (AI), Computer Science & SE, Auburn University, AL GPA: 3.57 May 2021
MS, Computer Science, Northwestern Polytechnic University, CA GPA: 3.76 Dec 2016
BE, Computer Engineering, Gujarat Technological University – India GPA: 3.00 May 2014

Industry Experience

Software Engineer Intern, iOS – **IMVU, Redwood City, CA** July 2017 - Dec 2017
Software Engineer Intern – **Attala Systems Corp., San Jose, CA** March 2017 - July 2017
iOS Software Engineer Intern – **(1) RiteTag, (2) Filmakr Labs LLC** May 2016 - Oct 2016
iOS Application Developer – **Cimcon Software PVT LTD, India** April 2014 - Aug 2015

Technical Skills

Languages: (**Proficient** - Python, Swift, Objective-C, Java) | **Intermediate** - Ruby, C/C++, JS, Typescript
AI/ML Frameworks (Python): Pytorch, Tensorflow, Huggingface, LangChain, vLLM, Numpy, Pandas, Matplotlib, NetworkX, Scikit-Learn, Statsmodels, Spacy, cuML, Django, Flask, RESTful APIs, Multiprocessing, Celery
Concepts: Clustering(HDBSCAN, UMAP), Topic-modeling, Community-detection (Graphs), Prompt Eng.(CoT)
Models: Transformers (RoBERTa), LLM (Llama 3), CLIP, Vision models (e.g., SAM). [Model finetuning/training]
Cloud & Databases: AWS, GCP, Docker, MongoDB, Postgresql, Vector-DB (qdrant), RAG. [Git, LaTeX]

More about Jay…

Selected Research Projects

LLM for social media content moderation

- Designed a prompting technique like CoT to detect hateful content using Llama-family-based models.
  - ➢ Achieved SOTA performance, outperforming fine-tuned GPT-3.5 models on existing datasets.
- Analyzed LLMs' non-deterministic behavior across 3 social media platforms, finding scenarios where LLMs face challenges detecting hate speech.
- Developed an interpretable framework to understand the reasoning behind LLM failures in detecting hateful content.

Analyzing political leaning from podcast videos

- Developed and implemented an automated pipeline to extract themes from podcast videos.
- Utilized face detection models to construct a personality network for podcast content analysis.
- Designed an algorithm to represent videos using unique image frames while preserving temporal information.

Machine learning models for characterizing sentiments on Web

- Created a synthetic image dataset and trained a DenseNet model to detect hateful symbols (e.g., Nazi flags) in images, achieving 90% AUC-ROC.
  - ➢ Scaled model's inference to 1 million images in under 3 hours.
- Trained a RoBERTa model to detect emotions from Reddit posts, inferring emotions from 152 million crypto-related community posts.

Game-theoretic framework to evolve AI agents

- Designed a game-theoretic framework facilitating AI agents to play a multiplayer economic game.
- Implemented attacker and defender AI agents using a competitive coevolutionary algorithm to evolve winning strategies (e.g., greedy agents spend all given money on short-term rewards).
- Designed an objective function inspired by Claude Shannon's chess game state-eval equation for strategic decision-making.

Data collection from social media platforms

- Design and implement a continuous, efficient web-crawling system to collect social media data.
- Writing efficient Python scripts to process millions of data points for large-scale analysis, including cleaning, organizing, and restructuring.
- Released ~600 million multi-modal, multi-lingual data points on Huggingface across three projects.

Leadership, Volunteer, and Organizational Experience

Research Lead – Binoloop, Canada — Aug 2024 - Present
Gujarati Language Ambassador – CohereForAI's Aya — Aug 2023 - Feb 2024
Founder & Lead Organizer @GDG Cloud Auburn — March 2019 - March 2021
Media Designer @Indian Students Association, Auburn Uni. — Jan 2019 - Aug 2020
Volunteer tutor to Elementary schools @Code.org Volunteer — Jan 2017 - Aug 2021

Graduate Teaching Assistant — Jan 2018 - Dec 2022

- CS515 - Social Media Data Science Pipeline (Fall '22)
- COMP3500 - Introduction to Operating Systems (Spring '18)
- COMP3220 - Programming Languages (Spring '18, Fall '18, Fall '19, Spring '20)
- COMP7270 - Advanced Algorithms (Spring '19)