JAY PATEL

Ph.D. student | Social Networks Analysis | Data Science (Python) | ML & AI
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Research Interest (2021 - Present) - iDRAMA Lab

- I work on detecting ***misinformation*** from Social Media Platforms - Reddit, Twitter, & 4chan.
- Understanding ***multimedia(memes & videos)*** *content* & developing ***Graph-network algorithms*** to unveil hidden coordinated groups from social media platforms.
- **USAToday(MediaCoverage)** - Computer vision model to detect ``Kekistani flag`` from 1M images. read here

Professional Summary

- 4+ years of academic research experience(GRA) - ***AI projects, Deep Learning, and Evolutionary Computing.***
- 3+ years of industrial work experience - ***iOS Software Engineer, Full Stack Engineer, UI/UX Designer***.
- 20+ talks on *Google Cloud Platform(GCP)* as a ***Founder of*** *GDG Cloud Auburn* - a chapter of Google Developers Group, Lead Organizer for 2 years.
- Tech conference organizer of *DevFestAuburn19* for 100+ attendees, 10+ speakers at Auburn University.

Education

Ph.D. student, Computer Science, StateUni of NY@Binghamton, NY GPA - 3.73 Aug 2021 - Present
- Advisor: Dr. Jeremy Blackburn

MS-Research, Computer Science & SE, Auburn University, AL GPA - 3.57 Aug 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
- Achievement: Being called as a **"*TestGURU*"** for writing solid test cases to newly migrated code in swift.

Software Engineer Intern – Attala Systems Corp., San Jose, CA March 2017 - July 2017
iOS Software Engineer Intern – RiteTag May 2016 - Oct 2016
iOS Software Engineer Intern – Filmakr Labs LLC July 2016 - Sep 2016
iOS Application Developer – Cimcon Software PVT LTD, India April 2014 - Aug 2015

Academic Research Experience (6 projects –> 2 publication in-progress)

Understanding memes through multimodal fusion techniques Aug 2022 - Present
- Fine tune state-of-art vision and language model with fusion technique to understand multimodal memes.

Detect images that spreads propaganda (aka misinformation) Aug 2022 - Present
- Developing a pipeline to detect propagandic objects (e.g., nazi flag) on fly from social media posts.

Detect hidden coordinated groups from Reddit platform March 2021 - Present
- Developing clustering techniques to detect hidden communities from Reddit & Twitter.

Evolve AI Agents for Satellite Mega-constellations game, AuburnUni. Oct 2020 - Aug 2021
- Evolving Artificial Intelligent(AI) agents to play against human players in a multiplayer game to model economic competition of mega-constellations using Genetic Programming & Evolutionary Algorithms.

Competitive Coevolution for Satellite Mega-constellations Security, AuburnUni. Feb 2020 - Oct 2020
- **PUBLICATION:** Jay Patel, Dhathri H. Somavarapu, Deacon Seals, Daniel R. Tauritz, and Davide Guzzetti. *Adversarial Threats to LArge Satellite Networks (ATLAS-N): A Coevolutionary Approach Based on FlipIt.* In Proceedings of the 22nd Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '20), pages 1503–1511, Cancún, Mexico, July 8-12, 2020.

Behavior, Inference, Cognition Model for Self-Driving car(Level-3), AuburnUni. Jan 2018 - Dec 2018

Graduate Teaching Assistant

JAN 2018 - Present

- 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)

Key Skills

Languages: Proficient in - Python, Swift, Objective-C, Java | **Intermediate** - Ruby, C/C++, JS, Dart, Typescript, C#, Php, Scheme, Prolog, Ada, HTML5, CSS/SCSS, R programming, SAS Software
Python: Numpy, Pandas, Matplotlib, NetworkX, Django, Flask, RESTful Technology, Multiprocessing
AI/ML Frameworks: Tensorflow, Pytorch, Keras, iNNvestigate, LightGBM, Scikit-Learn
iOS: MVC/MVVM, Push Services, SQLite, Core data, iCloud, AVFoundation, MLKit, Autolayout, CocoaPods
Java: Jsp, Servlet, RMI, JDBC, Collections, Spring, Design Patterns, Multithreading, Networking, JAX-RS, REST
Cloud & Databases: AWS, Google Cloud Platform, Heroku, Mysql, SQLite, Realm DB, MongoDB, Postgresql
APIs: Google Maps/Vision/Analytics API, Facebook graph API, Twitter API, Square & Stripe payment API

Selected Projects

Detect images that spreads propaganda in the wild – [Deep Learning, Tensorflow, Python]

- In this work, I trained a neural-network model that detects "kekistani flag" from social media platforms. We scaled the model to run in ***less than 3 hours on 1 million images*** collected from 4chan with ***91% accuracy***.
- One of the major challenges is unlabeled dataset to train the model and achieve higher Precision measure.

Detect hidden coordinated groups from Reddit platform – [NetworkX, Graph-algo, Clustering Python]

- This work uses graph algorithms to detect hidden coordinated groups from graph clusters. I created a custom similarity metric that leverages minimum information from social media users.
- The methodology works on a huge graph network that includes about ***1 million edges connected between ~20k nodes.***

Data collection from social media platforms – [Beautifulsoup, Faktory, Docker, Python, PostgreSQL]

- I have developed a continuous efficient data collection system that collects the data from websites like 4chan and Reddit, stores into PostgreSQL and media to S3. This system has collected ***5 million data records in the last 4 months.***

Evolve AI-agents to play economic game – [Genetic Programming, Evolutionary Algorithms, Python]

- In this work, I developed an AI-agent that evolves novel business strategies to win an economic competition in a multi-player setting. ***The proud unpublished research project with 2500+ lines of code and 1000+ hours of simulation.***

Behavior, Inference, Cognition Model for Self-Driving car(Level-3) – [ML ensemble modeling, Python]

- Predict the next action of the driver by ensembling three machine-learning models VGG16, LSTM and Gradient-boosting decision tree. We achieved 80+% accuracy in driver's behavior prediction. More..

Leadership, Volunteer, and Organizational Experience

Founder & Lead Organizer @GDG Cloud Auburn — March 2019 - March 2021
Media Developer @Indian Students Association — Jan 2019 - Aug 2020
Volunteer tutor to Elementary schools @Code.org Volunteer — Jan 2017 - Aug 2021

Related coursework

Social Media Data Science Pipeline | Theory of Nonlinear optimization | Matrix theory & applications | Experimental Statistics-I & Experimental Statistics-II | Advanced Operating Systems | Advanced Computer Architecture | Artificial Intelligence | Big Data – Hadoop, MapReduce | Algorithms & Data structure | Mobile Application Development | Cloud computing