Harsh Patel

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Education

University of California San Diego — *California, USA*

M.S. Computer Science and Engineering (GPA: 4/4) [***Transcript***] — *2022 - 2024*

Relevant Coursework: Search & Optimization, Probabilistic Reasoning & Learning, Adv Data-Driven Text Mining

Indian Institute of Technology Gandhinagar — *Gandhinagar, India*

B.Tech. with Honours in Computer Science and Engineering (CPI: 9.01/10) [***Transcript***] — *2018 - 2022*

Technical Knowledge

Programming Languages: Python, Go, C, C++, MATLAB, SQL, Verilog, JavaScript, HTML, CSS, SLURM Scripting

Tools: Git, PyTorch, Tensorflow, Kubernetes (Beginner), Docker, GCP, ROS, OpenCV, Django, LaTeX, Node.js (Beginner), Huggingface

Publications

Zeel Patel, **Harsh Patel***, Palak Purohit*, Shivam Sahni*, Nipun Batra, **Accurate and Scalable Gaussian Processes for Fine-grained Air Quality Inference**, Thirty-Sixth AAAI Conference on Artificial Intelligence (**AAAI (2022)**) [***doi***]

Harsh Patel, Xulang Zhang, Qian Liu **Enhancing Negation Scope Detection using Multitask Learning**, 2021 International Conference on Data Mining Workshops, (**ICDMW (2021)**) [***doi***]

Harsh Patel*, Praveen Venkatesh*, Shivam Sahni*, Varun Jain*, Mrinal Anand, Mayank Singh, **Program Synthesis: Does Feedback Help?**, ACM India 5th Joint International Conference on Data Science and Management of Data (**CoDS-COMAD (2022)**) [***doi***][***poster***]

Rohan Patil*, Raviraj Dave*, **Harsh Patel**, Viraj Shah, Deepayan Chakrabarti and Udit Bhatia, **Assessing the interplay between travel patterns and SARS-CoV-2 outbreak in realistic urban setting**, (***Applied Network Science* 6, 4, SpringerOpen(2021)**) [***doi***]

Relevant Experiences

Nokia Bell Labs — *Murray Hill, New Jersey*

Autonomous Systems Research Intern | Mentor: Mrs. Buvaneswari Ramanan — *June 2023 - Present*

- Leveraging large language models (LLMs) to enhance Nokia's patent-pending, proprietary MLOps platform for the end-to-end operations of ML-based use cases.
- Developing innovative task-specific knowledge enrichment strategies, involving automatic retrieval using Langchain and vectorstores, to improve the performance of LLMs in complicated code generation tasks.

Nanyang Technological University — *Singapore*

Research Intern | Mentor: Prof. Erik Cambria — *May. 2021 - Jul. 2021*

- Developed a *deep multitask learning* framework that enhances the performance of Negation Scope Detection using POS tagging as an auxiliary task. Used *transformers* and *neural tensor fusions* to leverage the inter-task correlations. Achieved **5%** improvement over the baseline models.

Mysuru Consulting Group (MCG AI) — *Mysuru, India*

Machine Learning Intern | Mentor: Mr. Gautam Ramachandra (CTO) — *Apr. 2020 - June. 2020*

- Conducted advanced data processing and analysis to extract valuable insights from financial datasets. Used LSTMs for stock market excess return forecasting.

Projects

Advancing Model-Agnostic Text Dataset Distillation GitHub Repo Arxiv — *UC San Diego*

Mentor: Prof. Jingbo Shang ▷ NLP | Deep Learning | Efficient Learning — *Apr. 2023 - June 2023*

- Developed novel text-dataset distillation techniques that demonstrate strong cross-architecture generalization capability, enhancing efficiency and performance in natural language processing tasks. Achieved a remarkable 95% distillation ratio with just 30 samples.

Robust, Scalable, & Fault-Tolerant Networked File Storage Service — *UC San Diego*

Mentor: Prof. George Porter ▷ Networked Systems Design | Distributed Cloud Computing — *Jan. 2023 - Mar. 2023*

- Developed a cloud-based file storage system, leveraging **gRPC** for streamlined communication, **Consistent Hashing** for efficient load balancing, and the **RAFT** consensus algorithm to ensure fault-tolerance and consistency.

Accurate and Scalable Gaussian Processes for Fine-grained Air Quality Inference Repo GP-Viz — *IIT Gandhinagar*

Mentor: Prof. Nipun Batra ▷ Applied & Data-Driven Machine Learning | Bayesian Modeling — *Aug. 2021 - May 2022*

- Implemented stationary & non-stationary probabilistic **Gaussian Process** models for urban air quality estimation - as spatio-temporal regression. Our **uncertainty-aware** approach outperformed conventional baselines on standard air quality datasets.

Exploring Constrained Reinforcement Learning for Autonomous Driving GitHub Repo — *IIT Gandhinagar*

Mentor: Prof. Nipun Batra ▷ Reinforcement Learning | Policy Optimization & Evaluation — *Jan. 2021 - May. 2021*

Honors and Community Engagement

2022 **Cash Award for Journal Publication**, Scheme for IITGN Students ($140)

2021 **Teaching Assistant - Machine Learning and Natural Language Processing courses**, IITGN

2021 **Pull Request (PR) accepted for PyMC**, Open source GitHub package for Bayesian statistical modeling

2019 **Leadership - Core Committee Member**, Amalthea - Tech Summit, Jashn - Cultural Fest at IITGN

2018 **Joint Entrance Exam (JEE)**, All-India-Rank 143 out of 1.13 million candidates