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, Graduate Networked Systems, Unsupervised Learning

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, C, C++, Go, MATLAB, SQL, Verilog, JavaScript, HTML, CSS, SLURM Scripting

Tools: Git, PyTorch, Tensorflow, Kubernetes (Beginner), Docker, ROS, OpenCV, GCP, 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 - August 2023*

- Leveraged large language models (LLMs) to enhance Nokia's patent-pending, proprietary MLOps platform for the end-to-end operations of ML-based use cases.
- Developed 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

Motion Planning, Localization and Mapping using Qualcomm Robotics RB5 platform Demo   *UC San Diego*

MENTOR: PROF. HENRIK CHRISTENSEN   ▷   ROBOTICS | SIMULTANEOUS LOCALIZATION AND MAPPING   *Sept. 2022 - Dec. 2022*

- Implemented fundamentals of robotics on MegaBot mBots with on-board *Qualcomm RB5 platform*. Covered several aspects including kinematics, vision & perception, localization, control and motion planning for the robot.

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*

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

MENTOR: PROF. NIPUN BATRA   ▷   REINFORCEMENT LEARNING | POLICY OPTIMIZATION & EVALUATION   *Jan. 2021 - May. 2021*

Explainability Methods for Graph Neural Networks - Super-pixel Image classification Arxiv   *IIT Gandhinagar*

MENTOR: PROF. ANIRBAN DASGUPTA   ▷   COMPUTER VISION | EXPLAINABLE AI   *Jan. 2022 - May. 2022*

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