Malhar Patel

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Education

- **Master of Science in Computer Science; GPA: 3.85** Sept 2023 - May 2025 (Expected)
  New York University *New York, USA*
  - : **Student Researcher** at NeuroInformatics Lab - A Computational Neuroscience lab
  - : Relevant Coursework: Design and Analysis of Algorithms, Principles of Database Systems, Machine Learning, Artificial Intelligence, Neuroinformatics (TA), Computer Vision (TA), Network Security, Information Visualization
- **Bachelor of Engineering in Computer Engineering; GPA: 3.52** Aug 2018 - Apr 2022
  G H Patel College of Engineering & Technology (Head of Programming Club) *Vidyanagar, India*
  - : **Head** of **Regional Coding Club** - CSI (Computer Society of India)

Skills

- **Languages & Frameworks**: Java, **Python**, R, JavaScript, C/C++, TypeScript, Angular, Node.js, Express.js, Kotlin, Django, PyTorch, TensorFlow, JUnit5, Mockito, Jest, Optuna, HuggingFace, OpenNeuro, Weights and Biases (WandB), Android SDK
- **Database Technologies**: MySQL, PostgreSQL, MongoDB, GraphQL, SQLite, Liquibase, Redis
- **Tools**: Apache Spark, Apache Kafka, Tableau, Pentaho, **Docker**, Spring boot, Microsoft Power BI, Microsoft Office, Git, GCP, AWS, Azure, JIRA, REST, Scrum, **CI/CD**, Unit Testing, Agile, Version Control, Kubernetes, Distributed and Parallel Systems, ML Pipelines, LLM Finetuning (Llama and more)

Work Experience

- **Tangoe, Inc. (Indianapolis, IN) (Software Engineer)** May 2022 - June 2023
  Jeavio Pvt. Ltd. (Boston, MA)
  - : Optimized invoice processing by developing an Invoice Exception Processing (IEP) system, consolidating data from five sources, handling **2M+ invoices/month**, and boosting **efficiency by 30%**.
  - : **Enhanced PostgreSQL** performance, reducing data retrieval times by 35%, improving responsiveness for **high-volume financial transactions** and built a **scalable Java backend** with RESTful APIs (Spring Boot), improving data handling speeds by 40% and streamlining inventory reconciliation.
  - : Developed an **invoice classification model** using **self-supervised graph-based neural networks**, accelerating decision-making for analysts.
  - : Automated exception resolution with **Pentaho ETL pipelines** & Flowable workflows, cutting analyst workload by 50% and handling **500M Kafka messages/month**.
  - : Designed a **GPT-2-based** mail service to auto-generate custom alerts, ensuring rapid response to critical exceptions.
  - : Achieved **95% code coverage** with rigorous unit testing (JUnit, Mockito, Jasmine, Karma), ensuring software reliability in production.
- **Tangoe, Inc. (Indianapolis, IN) (Software Engineering Intern)** Jan 2022 - Apr 2022
  Jeavio Pvt. Ltd. (Boston, MA)
  - : Developed a Resource Management Application for HR and managers, streamlining resource allocation across teams and projects—a solution **still in active use**.
  - : Built custom Gantt charts in Angular with a scalable Node.js backend, enabling secure, multi-user access with end-to-end authentication. Designed a **flexible data architecture** using GraphQL and MongoDB, integrating NoSQL and graph features for efficient cross-team tracking.
  - : Achieved **70% code coverage** with Jasmine & Karma, ensuring software reliability through rigorous testing.

Projects

- **Neurodegenerative Disease Detection via Enhanced EEGNet**: Link Completed
  - : Developed a **customized EEGNet**, a convolutional neural network (CNN), to classify subjects as Alzheimer's, Frontotemporal Dementia, or normal, using advanced neural network techniques.
  - : Built a robust **preprocessing pipeline** for over **300 GB** of raw **EEG data**, re-referencing signals to original brain locations, removing noise, and downsampling, enabling high-quality data for analysis. Applied **Optuna** to optimize model **hyperparameters**.
  - : Achieved a **balanced accuracy of 83%**, demonstrating **competitive performance** compared to **recent studies** in neurodegenerative disease classification.
- **Efficient Prediction of Probed Brain Regions from LFP Data (Potential NeurIPS Submission)**: Ongoing
  - : Engaged in **pioneering** research to develop a classification pipeline that predicts the **brain region** of an inserted probe in **real time**, aiming to **replace** the **lengthy conventional approach**. This breakthrough could **enhance precision** in **neurosurgical** applications and **epilepsy treatment** by utilizing **LFP brain activity** as an input feature.
  - : Managing over **4 TB** of in-vivo brain recordings, focusing on **efficient data preprocessing** and implementing **threaded, resource-optimized** solutions tailored for **HPC clusters**.
  - : Established robust model baselines with SimCLR and BrainBERT, integrating these advanced models as benchmarks and utilizing WandB for **sophisticated hyperparameter optimization**.