

PARTH PATEL

☎ 361-443-6241 ✉ parthpatel3343@gmail.com  [PatelParth24](#)  [patelandpatel](#)

Experience

Data Scientist - Document Processing & Information Retrieval

May - Aug 2025

University of Texas at San Antonio

San Antonio, Texas

- Engineered and deployed a production-grade **RAG pipeline** with agentic capabilities, **fine-tuning embedding models** for domain-specific document understanding and implementing automated evaluation metrics for retrieval precision.
- Reduced query response times by **40%** through systematic **RAG** optimization, implementing **A/B** testing infrastructure for **retrieval strategies** (dense vs. hybrid search) and monitoring context relevance across **10K+** production queries.
- Built **ML pipeline** for document classification, training **BERT models** on **50K+ documents** with distributed GPU infrastructure, achieving **94%** accuracy and implementing automated retraining workflows for drift detection.

Research Scientist II

Sep 2023 - April 2025

University of Texas at San Antonio

San Antonio, Texas

- Fine-tuned Large Language Models (LLMs) on medical datasets using **QLoRA** and **Fully Sharded Data Parallel (FSDP)**, reducing memory usage by **60%** and enabling training of **7B+** parameter models on single-GPU instances.
- Implemented **LoRA/QLoRA** on **Llama-3-8B** and **Mistral-7B** for NHANES/Jackson Heart Study analysis, achieving **95%** of full fine-tuning performance with **99%** fewer parameters (**2.8M vs 278M**) and **87%** faster training.
- Accelerated model deployment cycles by **40%** by containerizing **fine-tuned models** in **Docker** and deploying on **AWS (ECR/ECS)**, with automated **CI/CD pipelines**, enabling one-click rollback.

Data Scientist - Retail Analytics & Revenue Optimization

May - Aug 2023

La Paletera

Corpus Christi, Texas

- Increased daily **revenue** by **12%** and reduced ingredient waste by **18%** by developing an analytics dashboard tracking sales patterns, customer behavior, and seasonal trends using **Python** and **POS data analysis**.
- Improved inventory management through demand forecasting by implementing **XGBoost/LightGBM** models for **time-series analysis**, optimizing fresh fruit ordering, and reducing spoilage.
- Enhanced seasonal business strategy through **SQL database queries** analyzing customer preferences and sales patterns, **boosting winter sales** by **15%** via optimized product mix that addressed typical paleteria off-peak challenges.

Publication

ReguloGPT: Harnessing GPT for End-to-End Knowledge Graph Construction of Molecular Regulatory Pathways - IEEE BHI'24 (2024)

- Engineered **reguloGPT**, a novel end-to-end framework using **GPT-4** and **In-Context Learning (ICL)** to extract complex, hierarchical Molecular Regulatory Pathways (MRPs) from unstructured biomedical literature.
- Constructed and deployed **m6A-KG**, a large-scale, context-aware Knowledge Graph (**2.4k nodes, 4.7k edges**), by using an NLP framework to extract and structure regulatory pathways from **1.4k** m6A-related titles.
- Designed **G-Eval**, a novel LLM-based evaluation framework that leverages GPT-4 for annotation-free **performance** assessment, proving **high correlation** with human-annotated benchmarks for evaluating KG generation.

Projects

Human Action Recognition: Helping Autism

- Designed and trained **CNN-LSTM** deep learning model achieving **84%** accuracy in classifying patient behaviors for autism care using spatial-temporal feature extraction from video frames and **PyTorch** implementation.
- Built cloud-based **Flask API** service deployed on **AWS**, enabling secure, scalable access through **RESTful APIs** and reducing **30 hours** of **manual monitoring** per patient monthly through automated tracking dashboards.

Apartment Hunter: ML-Powered Rental Price Prediction System

- Achieved **85%** price prediction accuracy by processing **50K+** rental listings with **Apache Spark** for feature engineering and optimized **SQL** queries for data extraction with ensemble (XGBoost, RF) models to find undervalued properties.
- Created interactive **web dashboard** with Python and Flask displaying apartment recommendations and price comparisons, enabling users to filter properties by budget, location, and amenities.

Education

University of Texas at San Antonio

Aug 2021 – May 2023

Master's in Electrical and Computer Engineering

San Antonio, Texas

University of Texas at San Antonio

Aug 2023 – May 2027

PhD in Computer Engineering

San Antonio, Texas

Skills

Languages: Python, Matlab, SQL, Tableau, Excel, MLOps, Flask.

Developer Tools: Apache Spark, AWS, Azure, Jupyter Notebook, Google Colab.

Technologies/Frameworks: Git, Scikit-Learn, NumPy, Pandas, Matlab, TensorFlow, PyTorch, Model Fine-tuning.