# Satyam Chandrakant Chatrola

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## EDUCATION

**New York University** — New York City, NY
*Master of Science in Computer Science (CGPA: 3.67 out of 4.00)* — *September 2023 – May 2025*

**Gujarat Technological University** — Gujarat, India
*Bachelor of Engineering in Computer Engineering (CGPA: 3.79 out of 4.00)* — *June 2018 – June 2022*

## SKILLS

**Languages and DBs**: **Python, SQL**, C++, Java, PostgreSQL, MySQL, MongoDB, Apache Solr, **Elasticsearch, Qdrant, Pinecone**.

**AI and ML**: SVMs, Gradient Boosted Trees, Clustering, Computer Vision, CNN, **Natural Language Processing**, **Transformers, Recommendation and Search Systems**, **LLMs (RAG, PEFT, LoRA)**.

**Data Science**: NumPy, Pandas, Polars, Matplotlib, Seaborn, SciPy, Scikit-learn, **PyTorch, TensorFlow, Transformers, Bitsandbytes, Ollama, Langchain**, Optuna, Tableau, **Hypothesis Testing, A/B Testing**.

**MLE, MLOps and Data Eng.**: **AWS SageMaker, ONNX, TensorRT**, MLflow, Evidently, Apache (Hadoop, Spark, Airflow, Kafka).

**SWE and Others**: **AWS, Google Cloud Platform (GCP)**, REST APIs, Git, **Docker, Kubernetes, CI/CD (CircleCI, GitHub Actions)**, Flask, **Django, FastAPI, Redis, Pytest**, System Design, HTML, CSS, JavaScript, Node.js.

## EXPERIENCE

**Rapidops** — Ahmedabad, India
*Machine Learning Engineer* — *January 2022 – June 2023*

**Facial Recognition based Authentication and Authorization System** *(Python, PyTorch, YOLO, MTCNN, FaceNet, Triplet Loss, Qdrant)*
- Spearheaded a facial recognition based authentication and authorization system with **4 environments and 2 access points** from **data collection to on-premises deployment and monitoring**; enhancing productivity tracking and premises security.
- Architected a **scalable microservice** utilizing YOLO, MTCNN, fine-tuned FaceNet model, and Qdrant to achieve **low-latency** authentication and authorization on **live video streams**, delivering a **0.93 F1 score** without need to retrain for new individuals.

**AI-Powered Search and Recommendation System** *(Python, PyTorch, Hybrid Recommenders, Apache Solr, Docker, FastAPI)*
- Boosted **conversion rate** by **23%** and **click-through rate** by **42%** with **collaborative, content, and market-basket** recommenders.
- Engineered search & recommendations with **custom taggers** & **LTR** techniques with **Apache Solr** to serve results in **25ms**.

**Natural Language (English) to SQL query generation** *(Python, TensorFlow, Keras, T5, BERT)*
- Researched and benchmarked **State of the Art (SOTA) AI models** generating SQL from Natural Language with **76% EMA**.
- Experimented with Transformers (**T5**, **BERT**) generating **73% Exact Match Accuracy (EMA)** with **36%** faster inference.

## RESEARCH EXPERIENCE

**Approaches to Type 2 Diabetes Mellitus Prediction with Machine Learning and Deep Learning**
- Researched AI techniques for Type-2 Diabetes Mellitus classification with **95.8% precision, 95.8% recall**, and **99.4% specificity**.

## PROJECTS AND OPEN-SOURCE CONTRIBUTIONS (with Embedded GitHub Repository URLs)

**RAG Microservice: Research-mate chatbot** *(Python, FastAPI, PyTorch, Transformers, RAG, GCP, Pinecone, Llama 3.2)*
- Engineered a **context-aware RAG**-based chatbot and **search** feature, leveraging **Pinecone vector database**, enabling semantic search across **2,700 research papers** with **95% query relevance** by **Anthropic AI's Contextual Retrieval** technique with fast inference.
- Optimized model performance with **Binary Quantization**, achieving **7x speedup** in **inference time** and **85% reduction** in **memory**.

**Microservices webapp: LLM Essay Evaluator** *(Python, PyTorch, ONNX, TensorRT, FastAPI, AWS, MLflow, Evidently, Frontend)*
- **Calibrated** Transformers (**BERT**) and LLMs (**GPT-2**) with **PEFT techniques** (quantization), cosine-annealed learning rate and warm-up to assess essays, attaining a **Kappa Score of 81.7%** and **surpassing the Benchmark** score by **5.7%**.
- Orchestrated **2 fault-tolerant microservices** & inferred with **ONNX models** and **TensorRT** via **asynchronous REST APIs**.

**Open Source Project: mAIgic** *(Python, SQLite, OpenAI Function Calling, CircleCI, Pytest, MyPy, Ruff, uv)*
- Architected an AI-powered email management system leveraging **OpenAI's function calling API**, achieving **95% accuracy in task extraction** and automated Trello board updates, **reducing manual email processing time by 70%.**
- Engineered a **production-grade API** with **100% test coverage** through automated **CircleCI pipeline** with static type checking.

**Open Source Project: ETL pipeline migration to Spark** *(Python, PySpark, AWS, MinIO, Databricks.Koalas)*
- Migrated **ETL pipeline** to **Spark** for **NYU's Open-Source** project with **160% speedup** in feature extraction for AI tasks.

## CERTIFICATIONS AND ACHIEVEMENTS

- Graduated from **Udacity's AWS Machine Learning Engineer Nanodegree** with top remarks.
- Secured **1st Runner Up** in **Qualcomm x Microsoft Hackathon** by pioneering **on-device Edge AI** solution with **Snapdragon NPUs**.