SIDDHARTH UPADHAYAY

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EDUCATION

VELLORE INSTITUE OF TECHNOLOGY, Vellore *September 2020 – June 2024*

B. Tech in Computer Science and Engineering with Specialization in Data Science

- **CGPA: 7.65**

EXPERIENCE

Artificial Intelligence Intern *March 2025 – Present*

Bhaskaracharya National Institute for Space Applications and Geo-Informatics (BISAG-N), Gandhinagar

- Contributed on evaluation fine-tuning a 7B parameter LLM (Mixtral) to generate GIS commands from natural language queries, enabling automation of geospatial workflows – through sematic similarity LLM as judge.
- Designed and implemented a Retrieval-Augmented Generation (RAG) system over large-scale unstructured data (PDFs), with in-depth R&D on chunking strategies and similarity search methods (Cosine, MMR, Euclidean).
- Optimized the end-to-end RAG pipeline to run efficiently in CPU-only environments, minimizing resource requirements while maintaining performance.
- Currently developing an NLP-based system to translate user queries into SQL for querying structured PostgreSQL databases, extending the RAG framework to structured data sources.

PROJECTS

Real-time Analysis of Cricket Player's Performance

- Developed an end-to-end pipeline to scrape live textual cricket commentary, convert it into structured numerical data, and enable real-time performance evaluation.
- Leveraged spaCy for web scraping and applied NLP techniques, including Named Entity Recognition (NER), to extract key events such as runs, wickets, boundaries, and milestones.
- Applied machine learning models—Random Forest, Multiple Regression, and Linear Regression—to predict player performance dynamically during live matches.
- Visualized performance trends and insights using Matplotlib for intuitive real-time dashboards and analytics reporting.

Zero-Knowledge Identification System

- Engineered a secure identification framework to mitigate socially engineered attacks by eliminating the "What user knows" pillar from traditional multi-factor authentication systems.
- Utilized Finger Hashing to generate unique user tokens, paired with cryptographic protocols including RSA, AES, and Digital Signatures for secure identity verification.
- Implemented a private blockchain to immutably store authentication transactions and public keys, ensuring transparency and tamper resistance.
- Built a lightweight cryptocurrency in Go for secure transaction validation; developed the mobile interface using Kotlin for seamless user interaction.
- Designed RESTful APIs for data exchange between client and blockchain, and containerized the entire system using Docker for scalable deployment and testing.

Automated Support Ticket Analysis & Routing

- Designed and developed a multi-agent AI pipeline to automate support ticket classification, urgency detection, and routing, reducing manual triage efforts across 12 ticket categories.
- Implemented a Router-Solver pattern using Google Gemini models and PydanticAI, achieving 91.7% accuracy in routing and prioritization.
- Engineered advanced, rule-based prompting strategies, improving AI-driven team assignment accuracy by over 16 percentage points.
- Integrated with JIRA API to auto-generate structured bug reports from user tickets, streamlining communication between support and engineering teams.
- Ensured robust and reliable data extraction using Pydantic models, eliminating runtime parsing errors and enabling seamless integration with downstream systems.

CERTIFICATION

AWS Certified Solutions Architect – Associate

Amazon Web Services (AWS)

Valid through: July 2026

- Gained proficiency in designing resilient, high-performing, secure, and cost-optimized cloud architectures aligned with AWS best practices.
- Covered services including compute, storage, networking, databases, and deployment strategies for scalable cloud solutions.

SKILLS

Languages: Python, MySQL, Bash

Technologies: Gen AI, Machine Learning, Computer Vision, Natural Language Processing, Deep Learning

Frameworks: TensorFlow, OpenCV, Scikit-Learn, Matplotlib

Tools: Docker, AWS