

TANMAY MORDUNEY

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B. Tech in Computer Science & Engineering | MCKV Institute of Engineering | CGPA: 8.024 | Expected: 2027 | AI Lead at Google Developers Group on Campus MCKVIE

TECHNICAL SKILLS

Languages: Python, C, SQL.

AI & Machine Learning: PyTorch, TensorFlow, Scikit-Learn, LangChain, FAISS, Hugging Face, 1D-CNN.

Data & Orchestration: Google Earth Engine, Pandas, Flask, PySerial.

Systems & Infrastructure: Docker, GPU Orchestration (CUDA Toolkit), Data Pipelines.

HACKATHONS

Techsprint 2025 (MCKVIE): 3rd Place, Metamorph 2025 (GNIT): Finalist, Calcutta_Hacks 2025 (Techno): Finalist

ENGINEERING PROJECTS

Project Kishan

Geospatial ML & Multimodal RAG Engine ([Deploy Link](#)) ([GitHub](#))

- Orchestrated an automated satellite pipeline using Google Earth Engine to extract dynamic spectral indices (NDVI, NDWI, NASA SMAP), enforcing strict geographic guardrails via **ESA WorldCover v200** to reject nonvegetative mapping and save compute resources.
- Engineered a localized **Retrieval-Augmented Generation (RAG)** system utilizing LangChain and HuggingFace to index 11 ICAR agricultural PDFs into a local FAISS vector database.
- Optimized retrieval using **384-dimensional embeddings** and a **500-token chunking strategy with 50-token overlap** to preserve inter-chunk context.
- Integrated a Flask backend with Twilio, enabling a multilingual **WhatsApp interface**.

Active Radar

Edge-AI Sensor Telemetry Node ([Video Demo Link](#)) ([GitHub](#))

- Built an end-to-end PySerial framework in Python to ingest, clean, and buffer 30 seconds of high-frequency chaotic analog signals from a custom active hardware gimbal at a **115200 baud rate**, dynamically mitigating structural noise across spatial, optical, and thermal telemetry.
- Designed and trained a lightweight 1D-Convolutional Neural Network (**16 filters, 8-node dense layer, TensorFlow**) to decode latent mathematical correlations within noisy hardware streams, accurately classifying physical states without relying on computationally expensive or privacy invasive camera feeds.
- Engineered a low-latency Flask web backend to serve live neural network classifications directly from the hardware edge.

Project Aegis (Ongoing)

Physics-Simulation Data Pipeline & Geospatial Twin ([Test Demo Link](#))

- Engineered a Python orchestration layer over a **GPU-accelerated LISFLOOD-FP C++** physics engine through Docker to automate the generation of spatial flood datasets (wd and mass matrices) for a future deep learning tensor stack.
- Simulated the baseline mass-routing logic of the Amphan Cyclone induced flood, successfully constraining water momentum using Manning's roughness data, ESA soil absorption and a DEM of Kolkata.