

# MAANA AV MOTIRAMANI

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## Summary

Applied AI / Full-Stack ML Engineer with production experience across the end-to-end AI pipeline, from data engineering and model development to GenAI product deployment serving 2,000+ users. UNSW International Scientia Scholar (A\$40K merit award).

## Skills

- **AI & ML:** PyTorch, TensorFlow, Scikit-learn, XGBoost, Hugging Face, LangChain, LangGraph, RAG, Time-Series, Computer Vision.
- **Data & Analytics:** Python, Pandas, NumPy, Matplotlib, SQL, PostgreSQL, Elasticsearch, Firebase, ETL Pipelines, Web Scraping.
- **Tools & Cloud:** Git, Docker, Azure, Azure ML, Power BI, Tableau.
- **Web & App Development:** FastAPI, REST APIs, Next.js.

## Education

### Master of Data Science and Decisions

Sep 2024 - Sep 2026

University of New South Wales

- Weighted Average Mark (WAM): 78.7 | Specialization: Computational
- Recipient of **UNSW International Scientia Scholarship (A\$40K)**, awarded for outstanding academic merit & leadership.

### Bachelor of Technology (B.Tech) in Computer Engineering

Jun 2021 - May 2024

SVKM's NMIMS Mukesh Patel School of Technology Management & Engineering (MPSTME)

- CGPA: 3.91/4 | Honours in Data Science/Analytics
- Awarded **Technical Achievement Award** (1 of 3 students for research & innovation), **Meritorious Student Award (Dean's List)** (Ranked Top 12 in graduating batch) and selected as **Student Ambassador** (1 of 8 students) for contribution to institute representation.

## Experience

### Research Collaborator, UNSW (Supervisor: A/Prof. Rohitash Chandra), Sydney

Apr 2026 - Present

- Predicting Mars dust storm intensity from pre-storm atmospheric conditions by merging storm catalog (MDAD) with dust opacity climatology (Montabone CDOD) across 5 Mars years.

### AI Engineer, Edify, Sydney

Feb 2026 - Present

- Building an **A-MEM** agentic memory using **LLM extraction** and **MongoDB Atlas Vector Search** to deliver personalized tutoring experiences on an EdTech platform.

### Co-Founder, Aegis AI, Sydney / San Francisco

Jan 2026 - Present

- Building a **real-time Agentic AI** safety system for construction sites; secured **US\$100K** in Microsoft for Startups Azure credits; Columbia AI Startup Challenge **Semifinalist**; selected for the UNSW Pre-X Accelerator (25/300 selected); interviewed with **Y Combinator** and other accelerators (<3% reach YC stage).
- Architected a **Multimodal Vision** pipeline with **LLaVA** and **YOLOv11** to perform zero-shot hazard reasoning on live camera feeds.
- Deployed the **FastAPI** backend to **Azure Container Apps** with **Docker** and Azure Container Registry (**ACR**).

### Founding Engineer (AI & Full Stack Developer), MentorAll, Sydney

Aug 2025 - Jan 2026

- Shipped a full-stack MVP to **100+ pilot users** (UNSW Peter Farrell Cup **Top 10 Finalist**); engineered a two-stage mentor-matching pipeline using LLM multi-label classification and LLM-as-a-judge A/B testing, improving match quality and user trust.
- Architected **Next.js (TypeScript)** app with **Google Analytics** events to track user behavior, designed **Airtable** data model and automation hooks to recompute matches on specific events.

### Machine Learning Engineer, Creative Innovation, India

May 2023 - Nov 2023

- Developed semantic search over a **10K+ MCQ repository** using **BERT embeddings**, reducing manual drafting workload by **25%**.
- Fine-tuned **Seq2Seq T5** on educational Q&A pairs to automate Question Generation, reducing test creation time by **~5 min per question**, resulting in quicker quiz/test generation at scale.
- Implemented a churn prediction model (Logistic Regression, Random Forest) on **3K** student/parent survey responses (**18.7%** churn); achieved ROC-AUC **0.86** (5-fold cross-validation), enabling targeted retention outreach.

### Data Engineer, Analystt.AI, India

Dec 2021 - Apr 2022

- Migrated **20M records** from **SQL** to **Elasticsearch**, reducing average query latency and enabling full-text search at scale.
- Engineered an **NLP pipeline** (**spaCy** NER, regex parsing) to extract **50K+** structured records from unstructured PDFs.
- Architected **12+** scrapers/API (Scrapy, Selenium) updating **20K+** records daily (saving **8 hrs/week**) & a **React/FastAPI** analytics platform to **audit data quality**, removing marketing's dependency on engineering.

## Projects

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**Autonomous Grocery Pricing Agent** ([UNSW Founders Peter Farrell Cup participant](#)) | [Video Demo](#) Jan 2025 - Present

- Developed a real-time price intelligence agent (**Ollama**) for semantic product matching across Woolworths, Coles & IGA. Validated product-market fit via interviews with **50+ shoppers and 10 local grocers**.
- Designed a multi-node **LangGraph** workflow with tool-use, **Human-in-the-Loop (HITL)** interrupts, and **structured** post-processing.
- Built **async FastAPI** with custom scrapers to aggregate live pricing; **LangSmith** for observability and implemented session-based **thread** for persistent conversations, reducing manual price comparison time by **86%** for end-users.

**Plastic Detection** (*1<sup>st</sup> of 770 teams from 19 countries, Kyndryl Hackathon*) | [Video Demo](#) Jul 2023 - Sep 2023

- Developed a **YOLOv8 ensemble** with **DBSCAN**, resulting in **49.18%** uplift in recall compared to a single YOLOv8 model.
- Reduced model training time by clustering **6K** images via **VGG16 embeddings**, **PCA**, and **K-Means** to reduce data redundancy; manually annotated and augmented a **300-image** Saigon River dataset to handle local environmental edge cases.
- Led a 4-member team to engineer a plastic drift algorithm mapping movement to water bodies using hydrographic data; integrated **FastAPI**, **Power BI**, and Dropbox for data pipeline.

**Predictive Maintenance Railway** | [IEEE Paper](#) Jun 2023 - Aug 2023

- Built a fault detection pipeline, applied **LSTM**, **Random Forest**, **XGBoost**, and **Isolation Forest** algorithms to predict faults in **1.5M+** multivariate time series data from train sensors with LSTM standing out with **95% recall** where failures constituted <1% of data.
- Implemented Explainable AI, including **SHAP** and **Global Surrogate Models**, to interpret ensemble predictions and isolate contribution of raw sensor inputs vs. temporal engineering.
- Developed **Grouped Permutation Importance** to handle time-series multicollinearity, validating true predictive signal of engineered **rolling window and lag features**.

**Retail Macro-Micro Analytics Dashboard** | [Technical Breakdown & Live Link](#) Oct 2025 - Nov 2025

- Implemented **Apriori (co-purchase)** and **RFM (segmentation)** in R; deployed a persona-based Streamlit dashboard.
- Mapped 10K+ UK transactions to **ABS** categories; designed interactive **Network Graphs** and **Time-Series Decompositions** to compare store-level behaviour with national trends.

## Certifications and Publications

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- **30+ ML/DS credentials:** UWash Machine Learning Specialization (Regression, Classification, Clustering & Retrieval) and DeepLearning.AI's Deep Learning Specialization (Neural Networks, Hyperparameter Tuning, Time Series) ([Full List](#)).
- Co-authored **9 IEEE/journal publications**, in NLP, CV & Applied Machine Learning ([Google Scholar](#)).

## Awards & Hackathons

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- 1st in 'Hackathon on Plastic-Free Rivers with AI Towards Sustainability', Kyndryl and awarded US\$1,800 | [Award Photos](#) Sep 2023
- "Take My Money!" Award - T46-Hour Terrible Ideas Hackathon, UNSW Founders | [Event Highlight](#) Apr 2025
- Secured 2nd place among 400+ participants in 'Cyber Cypher' hackathon by SVKM's NMIMS | [Presentation Video](#) Jan 2022
- Competed in **10 global hackathons** (NASA, Indian Govt., etc.), engineering predictive models, dashboards, and web/mobile apps.

### Selected Hackathon Projects

**Mistral AI Worldwide Hackathon** | [Product Demo](#) Feb 2026

- Built a **multi-agent** legal simulator fine-tuned on Australian case law (**Mistral 7B, LoRA**) with **RAG** and jurisdiction filtering using **LangChain** and **Chroma Cloud**; received a **US\$5,000** API credit offer from Isaacus.

**Preve & UNSW AI Soc Hack2Heal Hackathon** | [Pitch Video](#) Nov 2025

- Built a voice agent automating check-ins and notes to resolve retention pain points identified through clinician interviews.

**DataSoc x Atlassian Datathon** | [Business Case Study](#) Sep 2025

- Analyzed a 100K user cohort via Power BI, identifying 83% of churn occurred in free tier. Proposed an Enterprise pricing model for a \$228M ARR portfolio, projecting a 1.16% net churn reduction via targeted onboarding pilots.

## Extra-curricular

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- **Outreach Lead, What's On!** - Managed 50+ mentor outreaches & with data viz to provide insights for Marketing. (Feb 2025 - May 2025)
- **Project Mentor, ACM** - Mentored 8 junior developers, teaching Git version control, and industry best practices. (Dec 2021 - Aug 2023)
- **Arc Volunteer, UNSW's student organization (Producers & Check-Point)** - Engaged with students during food drives, working within a team to offer mental health support and resolve peer concerns through empathetic communication. (Sep 2024 - Dec 2024)
- **Community Service** - Managed crowd for 200+ guests at City of Sydney NYE event, restaurants & theatre with clear communication in high-pressure environments; prepared community meals at ISKCON and planted 100+ saplings. (2023 - 2024)
- **Creative Executive, NOW & ACM (2020-2022)**; 25+ illustrations on Dribbble (7.5K+ views); competed in multiple design competitions.