

# Somasree Majumder

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## EXPERIENCE

### Full Stack Machine Learning Engineer

March 2025 – Present

*DeepEdge*

*Hyderabad, India*

- Developed **end-to-end anti-UAV quadcopter tracking system** for runaway detection under challenging **infrared conditions**, delivering critical defense capabilities.
- Built advanced tracking models using **YOLOv8** with sophisticated object tracking algorithms including **linear and non linear Kalman filters**, and **infrared thermal optimization** for enhanced performance
- Enhanced the performance over 50 over yolov8s by introducing motion queues masks
- Managed 2-3 simultaneous client projects while maintaining high service quality and meeting all project deadlines. Researched and implemented findings from industry research papers like **ERFE** to achieve measurable performance improvements
- Introduced a new technique **MOG2 Background Subtraction + Morphological Cleaning → Contour Detection + Size/Shape Filtering + SVM Classification of Motion Candidates** which achieved 30 performance gains over yolov8
- Implemented cutting-edge point tracking algorithms including **Lucas-Kanade tracking** and **TAPNet** by **GoogleDeepmind**, **CoTracker** by **Facebook** for **precise tracking of point-like objects** in complex environments

### Machine Learning Engineer and Developer

July 2023 – March 2025

*Deloitte*

*Hyderabad, India*

- Architected and deployed **multilingual RAG pipeline** with **FAISS vector database management**, **FastAPI endpoints**, and **Docker containerization** for scalable AI solutions
- Engineered **Django-based movie recommendation system** utilizing advanced algorithms including **content-based filtering**, **FunkSVD**, and **popularity-based recommenders** for personalized user experiences
- Developed high-performance **predictive model for customer purchase likelihood** achieving **90% accuracy** through sophisticated feature engineering and ML techniques

### Machine Learning Developer

Feb 2023 – May 2023

*Unify.ai (Freelance)*

*Remote*

- Implemented robust functions across **TensorFlow**, **JAX**, **NumPy**, **PyTorch**, and **PaddlePaddle** frameworks, **increasing code coverage by 10%** and enhancing system reliability
- Led comprehensive **unit testing with Hypothesis framework** and managed **array-api-test suite** achieving **80% test coverage** for production-ready code
- Developed sophisticated **Ivy OpConverters for TensorRT backend** and **mentored contributors** through complex large-scale codebase navigation

## PROJECTS

### AI Agent Flight Scanner | *Groq, Ollama, DeepSeek-R1, LangChain, SQLite, ChromaDB, FastAPI*

2024

- Built **intelligent flight data analysis system** using advanced **RAG architecture** with **DeepSeek-R1-Distill-LLama-70B** and **LLama 3.2:3B models** for comprehensive flight analytics [\[GitHub\]](#)

### Amazon Product Classification | *PyTorch, Deep Learning, Machine Learning, ALBERT*

2023

- Engineered sophisticated **feature engineering and preprocessing pipeline** improving model **accuracy by 10%** using **synthetic PyTorch datasets** and **ALBERT transformer** for advanced multiclass classification [\[GitHub\]](#)

### Django Food Delivery Platform | *Django REST Framework, SQLite, JWT*

2023

- Architected comprehensive **full-stack food delivery platform** featuring **vendor management system**, **proximity-based search**, **payment integration**, dynamic menu management, automated tax calculations, real-time order tracking, and notification system [\[GitHub\]](#)

### ChildMind Anxiety Prediction | *TensorFlow, Gated RNNs, Deep Learning*

2023

- Developed innovative **predictive healthcare model** using **Gated RNNs** to analyze children's physical activity patterns for **early detection of problematic internet use**, contributing to child mental health research [\[GitHub\]](#)

### Custom Vector Database | *Python, HNSW Graphs*

2024

- Built high-performance **lightweight vector database** using **Hierarchical Navigable Small World (HNSW) graphs** for **efficient similarity search** and retrieval operations [\[GitHub\]](#)

## PUBLICATIONS & ACHIEVEMENTS

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**Challang Hackathon: Top 10 finalist** among **100 elite teams shortlisted worldwide** (2 participants per team) - demonstrating exceptional problem-solving capabilities on global stage

**Research Publications:** Published peer-reviewed papers in **IEMATICS 2020** (Homomorphic Encryption) [\[Paper\]](#) and **SPECTRUM 2020** (ML in Medicine) [\[Paper\]](#) - contributing to cutting-edge research

**Competitive Programming Excellence: Ranked 18/2500** in HackerEarth ML Challenge, **12/1000+** in Cipla competition, **1.6k globally** in Google Code Jam for Women [\[Certificate 1\]](#) [\[Certificate 2\]](#)

**Open Source Leadership: Active contributor** to major ML frameworks including **PyTorch Lightning**, **Hugging Face Transformers**, **KerasCV**, **KerasNLP** - recognized for high-quality contributions to global developer community [\[Profile\]](#)

**Elite Recognition Programs: LiFT Scholar 2022** (Top 500 worldwide), **GHC OSD'23 Mentor** for OpenSSF project - selected for leadership potential and technical expertise [\[Details\]](#)

## TECHNICAL SKILLS

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**Programming Languages: Python** (Advanced), **JavaScript**, **TypeScript** (Proficient), HTML5, CSS3

**AI/ML Frameworks: TensorFlow**, **PyTorch**, **JAX**, **Hugging Face Transformers**, NumPy, PaddlePaddle, Scikit-learn, Keras

**Backend & APIs: FastAPI**, **Django REST Framework**, Pydantic, **LangChain**, Microservices Architecture

**Vector & Databases: FAISS**, **ChromaDB**, **Pinecone**, MySQL, MongoDB, SQLite, PostgreSQL, Redis

**DevOps & Cloud: Docker**, **Kubernetes**, Git, CI/CD Pipelines, AWS, REST/GraphQL APIs MongoDB, SQLite, PostgreSQL, Redis

**GenAI Langchain,LangGraph**

**Problem Solving: Data Structures & Algorithms** - [LeetCode Profile](#) with competitive programming expertise

## EDUCATION

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**Institute of Engineering & Management**

*Bachelor of Technology in Electronics and Communication Engineering*

Aug. 2019 – May 2023

**8.94 CGPA**