

Madan Belbase

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github.com/MadanBelbase — Blog (AI & ML)

Education

Nepal College of Information Technology (NCIT), Pokhara University Pokhara, Nepal
Bachelor of Computer Engineering 2023 – Present

- Awarded full 100% merit-based scholarship by Pokhara University & Government of Nepal.
- **Relevant Coursework:** Machine Learning, Artificial Intelligence, Natural Language Processing, Deep Learning, Data Structures & Algorithms, Statistics.

Professional Experience

OSMSG Nepal (OpenStreetMap Statistics Generator) Remote
Frontend Developer (Supported by OSGeo Foundation Grant) Dec 2025 – Aug 2026

- Developing and maintaining open-source geospatial web applications for the global OSM community.
- Collaborating with international developers on specialized OSM contributor data visualization tools.

Projects

Automated Two-Wheeler Violation Detection & E-Challan System *Minor Project (Ongoing)*
Core ML & Deep Learning Contributor

- Building a real-time computer-vision pipeline with YOLOv8 for vehicle/rider detection, helmet-violation detection, and triple-riding detection from CCTV/RTSP streams.
- Implementing EasyOCR / PaddleOCR for Automatic Number Plate Recognition (ANPR).
- Developing the violation processing engine, evidence generation module, FastAPI backend, and monitoring dashboard.
- Optimizing deep learning models for GPU acceleration; preparing for edge deployment on NVIDIA Jetson.

Sentiment Analysis using LSTM *Personal Project*
Deep Learning & NLP Developer

- Developed an end-to-end NLP pipeline in TensorFlow/Keras to classify movie reviews as positive or negative utilizing the IMDB dataset of 50,000 labeled reviews.
- Engineered text preprocessing workflows, sequence padding mechanisms, and word embeddings learned entirely from scratch (10,000 vocabulary mapped to 128-dimensional vectors).
- Built a Recurrent Neural Network (RNN) architecture featuring a 64-unit LSTM layer, utilizing SpatialDropout1D and recurrent dropout techniques to mitigate overfitting.
- Authored modular, highly testable code structures featuring pipeline diagnostics, training curve visualizations, and custom text inference.

Technical Skills

- **AI/ML & CV:** YOLOv8, PyTorch, TensorFlow, Keras, LSTM, Object Detection, Multi-Head Attention, EasyOCR / PaddleOCR, Hugging Face Transformers, BPE Tokenization, OpenCV.
- **Languages:** Python, JavaScript (ES6+), TypeScript, C++.
- **Web & Backend:** React.js, FastAPI, Node.js, Express.js, MongoDB.
- **Cloud & DevOps:** AWS (S3, EC2), Docker, Git/GitHub.
- **Geospatial:** OpenStreetMap (OSM).

Technical Blogging & Writing

Author of madanbelbase.com.np

- Focuses on publishing conceptual deep-dives, walkthroughs, and tutorials regarding AI and Machine Learning.
- *Upcoming series:* YOLOv8 project deep-dive, LSTM end-to-end implementation, AI for Nepal.

Certifications

- **AWS Academy Graduate** – Cloud Architecting Sep 2025
- **AWS Educate** – Introduction to Cloud 101 Jun 2025
- **Orbit Engineering Hacks 2024** – Participant 2024

Leadership & Extracurriculars

- **Active Member:** Nepal Open Source Klub (NOSK) 2024 – Present
- **College Representative:** AWS Cloud Club Nepal, CFC Kathmandu, NTC Nepal Tek Community.
- **Hackathon Ambassador:** Hackademia 2.0 & 3.0 & active participant.
- **Challenges:** Completed 111 Days of Learning Challenge; Participant in Leapfrog LSP 2025.

Languages

English (Professional) — **Nepali** (Native) — **Hindi** (Conversational)