

Bhupendra Prasad Sah

Computer Engineering Student — Full-Stack & AI Engineer

sahbhupendra041@gmail.com — Dharan, Nepal

github.com/bhupendrasah1 — linkedin.com/in/bhupendra-sah-00b448317

SUMMARY

Computer Engineering student passionate about full-stack development, data science, and AI / Machine Learning & Deep Learning. Dedicated to combining robust software engineering with AI to build practical, reliable solutions to real-world problems.

EDUCATION

Bachelor in Computer Engineering

2023 – 2027 (Expected)

IOE Purwanchal Campus, Dharan

- Studying core CS fundamentals: data structures, algorithms, OOP, databases, networking, and software engineering.
- Active interest in scalable full-stack engineering, deep learning/computer vision, and vector search architectures.

SKILLS

Programming Languages: Python, JavaScript (ES6+), TypeScript, C, C++, SQL

Full-Stack & Web: Next.js (App Router, Server Actions), React, Vite, Tailwind CSS, Redux, Node.js, Express.js

AI, ML & Computer Vision: PyTorch, Grad-CAM (XAI), Google Gemini, LangGraph, LangChain, Sentence Transformers, OpenCV

Databases & Vector Search: PostgreSQL (Neon Serverless), pgvector (HNSW Indexing), Drizzle ORM, SQLAlchemy 2.0

DevOps & Security: Docker, Git/GitHub, Linux, NextAuth (RBAC), JWT, Google OAuth 2.0, Khalti & eSewa SDKs

PROJECTS

Intelligent Multi-Agent Tourism Platform (TravelNepal)

Next.js 16 (React 19) • FastAPI • Google Gemini • LangGraph • PostgreSQL (Drizzle/SQLAlchemy) • Khalti/eSewa

- AI Multi-Agent Planner:** Built an agentic itinerary system using FastAPI, Google GenAI SDK (Gemini), and LangGraph querying verified PostgreSQL records for 100% bookable, budget-aware multi-day travel plans.
- Full-Stack Architecture:** Engineered a Next.js 16 frontend with Server Actions, Tailwind CSS, and 5-tier Role-Based Access Control (RBAC) across tourists, hotel owners, restaurants, guides, and admins.
- Commerce & Safety:** Integrated Khalti & eSewa payment gateways, in-trip expense tracking, and a 1-Click SOS instant emergency protocol dispatching live geolocation to rescue authorities.

Agri-XAI – Multimodal Crop Diagnostic & Agronomic RAG System

PyTorch (EfficientNet-B4) • Grad-CAM (XAI) • pgvector (Neon PostgreSQL) • Google Gemini • Streamlit

- Vision & Explainability (XAI):** Trained PyTorch deep learning models with Grad-CAM backprop hooks to generate visual attention heatmaps, pinpointing infected foliar lesions and calculating coverage percentages.
- Zero-Hallucination Vector RAG:** Deployed Neon PostgreSQL with pgvector and HNSW cosine indexing (all-MiniLM-L6-v2) retrieving verified FAO/ICAR guidelines to guarantee accurate chemical dosages.
- Multimodal Advisory & TTS:** Orchestrated Gemini 1.5 Flash to synthesize actionable management plans (active ingredients, biological alternatives, PHI) paired with multilingual audio speech synthesis (TTS).

Vingo – Multi-Role Food Delivery Platform

React • Vite • Node.js • Express.js • PostgreSQL (Neon Serverless) • Redux • Tailwind CSS • Google OAuth/JWT

- Multi-Stakeholder Ecosystem:** Engineered a comprehensive food ordering platform interconnecting Customers, Restaurant Owners, Delivery Partners, and Admins with protected routes and RBAC authorization.
- Live Operations & Cloud Database:** Built interactive owner portals for menu management with image uploads (Multer/Cloudinary), dynamic cart state via Redux, and modular REST APIs deployed on Vercel.

CERTIFICATIONS

Complete web development course (100 Hours) — Udemy (Hitesh Choudhary)

Verify: UC-2e536693

Complete Data Science, Machine Learning, DL, NLP Bootcamp (99 Hours) — Udemy

Verify: UC-06215e98

C Programming Project Showcase — Winner — ACES & Programiz, IOE Purwanchal

13 Baisakh 2081

INTERESTS

Full-Stack Systems, Explainable AI (XAI), Vector Databases & RAG, Distributed Cloud Architecture, Open Source Contribution.