

Samir Poudel

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EDUCATION

Middle Tennessee State University (TN, USA)

Aug. 2023 – Dec. 2025

M.S. in Computer Science; GPA: 3.8

Gandaki College of Engineering and Science (Pokhara, Nepal)

Aug. 2018 – Dec. 2022

B.S. in Software Engineering; GPA: 3.30

SKILLS

- **Languages:** Python, JavaScript, TypeScript, C/C++, SQL, Solidity, LaTeX
- **ML/Frameworks:** PyTorch, TensorFlow, scikit-learn, Hugging Face, Flower FL, PySpark, Airflow, FastAPI, React, Next.js
- **Cloud & Tools:** AWS (SageMaker, Lambda, S3), GCP, Docker, Git, PostgreSQL, Supabase, Tableau, Power BI
- **Research Areas:** Federated Learning, LLM Fine-Tuning, Deep Learning, Blockchain Security, NLP, Computer Vision

EXPERIENCE

- **Graduate Research Assistant, MTSU, Murfreesboro, TN** Aug. 2023 – Dec. 2025
 - Architected and optimized ML/NLP pipelines (BERT, SVM, XGBoost), improving model accuracy by **32%** while reducing processing time by **28%**.
 - Published **17 peer-reviewed papers** (IEEE, ACM, Journal of Marketing Analytics, Machine Learning with Applications) on federated learning, blockchain security, and big data optimization.
 - Engineered distributed ML pipelines using PySpark and Airflow, scaling data processing to **10M+ rows** and cutting runtime by **45%**.
 - Led federated learning research for satellite imagery deforestation detection, achieving **0.85 IoU** while reducing cross-border data transfer by **97.3%**.
 - Formulated a spectral audit test and game-theoretic mechanism to verify differential privacy guarantees in federated LoRA LLM fine-tuning; achieved **100%** non-compliant client detection with under 6% false-alarm rate.
 - Designed HetLoRA-M, a federated LLM fine-tuning framework with adapter-space momentum across 50 heterogeneous clients (5 rank tiers); achieved **44.6% AUC** on Yelp, outperforming FlexLoRA by **+5.2 pp** ($p=0.032$) using PyTorch and Hugging Face.
 - Built RBBD, a representation-based federated learning defense framework reducing adversarial attack success to **<15%** with under 2% accuracy degradation.
- **Software Engineering Intern (Backend & Data Engineering), DataInsight** May 2024 – Aug. 2025
 - Engineered a developer-first real estate data API (HomeInsight Core) serving over **2.4 million** Tennessee property records, enabling complex market analytics and ownership intelligence.
 - Integrated third-party screening APIs to power HomeInsight's tenant screening tools, facilitating comprehensive credit, criminal, and employment verifications with a **97% accuracy rate**.
 - Architected robust database solutions to securely manage sensitive user data across tenant portals, including online payments, maintenance tracking, and direct messaging systems.
- **Full Stack Developer, TwoAce Solutions** Mar. 2022 – Jul. 2023
 - Developed and deployed scalable full-stack applications (React, TypeScript, Python, FastAPI) from concept to production, modernizing legacy technology infrastructure for enterprise clients.
 - Conducted performance audits and implemented system automations, reducing application load times by **35%** and streamlining business workflows across client deployments.
 - Designed and maintained robust PostgreSQL database schemas and RESTful APIs supporting complex data analysis, sentiment modeling, and real-time reporting functionalities.
- **Software Engineer – Data & AI, Urja Tech, Pokhara, Nepal** Feb. 2018 – Mar. 2022
 - Engineered automated data pipelines and analytics workflows in Python, boosting operational efficiency by **27%** and eliminating **240+ manual work hours annually**.
 - Designed and deployed SQL database schemas and Tableau dashboards tracking **50+ KPIs**, accelerating data-driven decision-making by **40%**.
 - Applied statistical analysis and ML techniques on **10k+ customer records** to surface behavioral trends, informing campaigns that lifted conversion rates by **18%**.
 - Built and deployed predictive ML models for business forecasting using Python and scikit-learn, optimizing resource allocation by **22%** and reducing cost overruns.

PROJECTS

- **Multi-Vendor E-Retail Platform**

Python, React, PostgreSQL, REST APIs, AWS

- Architected a scalable B2B/B2C marketplace supporting multiple vendors with dedicated vendor portals and a centralized content management system.
- Integrated third-party payment gateways and real-time logistics tracking APIs, ensuring secure transactions and automated order fulfillment workflows.
- Built advanced analytics dashboards enabling vendors to track real-time inventory, sales metrics, and customer insights, reducing stockouts and improving sales forecasting.

- **Enterprise Human Resource Management System (HRMS)**

Python, Vue.js, MongoDB, Docker

- Engineered an end-to-end HRMS platform featuring modules for employee onboarding, account management, and role-based access control.
- Automated email notifications, billing, and client management workflows via backend scripts, reducing manual administrative overhead by **27%**.
- Implemented advanced search and filtering functionalities enabling administrators to instantly query large datasets of employee profiles and performance reviews.

- **Automated Tenant Screening System**

- Developed comprehensive screening module achieving **97%** verification accuracy for reliable tenant selection.
- Integrated third-party APIs to automate background checks, credit reports, and employment verification into a unified dashboard.
- Secured sensitive user data within Tenant Portal architecture, ensuring safe processing of online payments and personal records across **100+** managed properties.

- **KCoding E-Learning Platform**

- Designed and deployed an interactive educational platform featuring project-based learning paths for AI basics, web design, and game development.
- Implemented a gamified progress tracking system supporting **50+** active students and contributing to a **95%** course completion rate.
- Built interactive UI components using React to create an engaging, 24/7 accessible learning environment.

- **Personal AI Assistant:** Designed and shipped a multi-model AI assistant with tool-calling (Gmail, finance, docs) and Telegram bot interface, eliminating context-switching across daily workflows; Next.js, TypeScript, OpenRouter.

- **I-140 Insights:** Built automated USCIS I-140 receipt tracker with real-time PostgreSQL analytics dashboard, enabling status monitoring without manual USCIS lookups; FastAPI, React.

- **Academic Tracker:** Developed grade tracker with AI syllabus extraction (Groq), live GPA calculator, and animated progress charts, reducing manual grade tracking to zero; Next.js, Supabase.

- **Personal Portfolio (samirpoudel.com.np):** Research portfolio with publication tracker, finance dashboard, and AI chat; Next.js, TypeScript, Supabase.

- **QuadraCode AI:** Multimodal transformer (source code + opcode + bytecode) for smart contract vulnerability detection (ICCCN 2024).

AWARDS

- **ACM Mid-Southeast Conference (2nd Place):** Blockchain + AI for healthcare data management.

- **Design Thinking Workshop (1st Place):** Tourist Rental App with 95% user satisfaction.