Sumit Yadav

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Summary

I have over four years of experience in AI and robotics, including developing computer vision projects and managing data analytics and CI/CD processes. Currently, I work on RAG systems, agent-based systems, and chatbots, while also developing task-oriented language models at Amnil Technology.

Education

- **Pulchowk Engineering College** — Kathmandu, Nepal
  Bachelor of Computer Engineering
  Courses: SDNs, FinTech, Operating Systems, Data Structures, Big Data, Artificial Intelligenc, Networking, Databases

Skills Summary

- **Languages**: Python, C, C++, Bash
- **Online Courses**: Deep Learning and GAN Specialization, Generative AI LLM, Image Understanding TensorFlow GCP
- **Tools/Module**: CI//CD, GIT,Pytorch,LangChain, LlamaIndex,Django, streamlit, MySQL, GraphQL
- **Soft Skills**: Leadership, Event Management, Writing, Public Speaking, Time Management

Experience

- **Amnil Technology Pvt. Ltd** — Lalitpur
  AI Engineer (Full-time) — *May 2024 - Now*
  - **Generative AI and Machine Learning Engineering**: On Project related to RAG, Agent based, recursive query, Chatbot, SQL Agent, and scheduling optimization. Made the system like Guardrails, LLM evaluation and Report generation.
- **Ed-Acadia** — Lalitpur
  Chief Data Oficer (Full-time) — *May 2022 - 2023*
  - **AI/ML Projects**: Supervising the project and research related to Data Science. Works of different DocumentsAI system for low resources language.
- **PDSC(Plan Design Solve Create)** — Lalitpur
  Software Coordinator (Full-time) — *May 2022 - 2023*
  - **Project Management**: Supervising the project and research related to Data Science.
- **DeepLearning.AI** — Virtual
  GAN Mentor (Part-time) — *Aug 2021 - Present*
  - **Course - GAN Specialization**: Helping the student in understanding the key concept behind Unsupervised learning (GAN).
- **Robotics Association of Nepal** — Lalitpur
  AI and Robotics Member (Part-time) — *2021 - Present*
  - **Making Robotics based system**: Done research and project related to Computer Vision based on raspberrypi microcontroller.

Publications

- **SUPPORT VECTORS ARE A BETTER WAY OF TEXT CLASSIFICATION FOR IMBALANCED DATA**: Present a robust SVC method for text classification (100+ classes) using term-frequency vectorization, achieving superior test data results over neural networks.
- **Machine Learning Analysis of Tirhuta Lipi**: Achieved 0.97 accuracy in Tirhuta Lipi character recognition using MobileNet embedding and logistic regression, with applications in translation and OCR for low-resource languages.
- **Revolutionizing Currency Security: A Yolov8-Based Approach for Automated Detection of Counterfeit Nepali Banknotes**: Implemented YOLOv8 to achieve a true positive recall of 0.82 (front face) and 0.9863 (back face) in detecting counterfeit Nepali banknotes, demonstrating significant advancements in counterfeit currency detection.

Projects

- **Retrieval Augmentation Generation System (RAG)**: Developed a retrieval-augmented reality system for enhanced information access and interaction. Tech: OpenAI, Gemini, Claude API keys, Python.
- **Nepali Chat with Doc**: Implemented a chatbot for Nepali language using Devanagari and Preeti fonts. Features include Guardrails system, post-conversation analysis, and agent-based systems like SQL Agent, Excel Agent, and Reflexive Agents. Preeti to Unicode Conversion. Tech: OpenAI, Gemini, Claude API keys.
- **Bachelor's Major Project: Evaluating Auto-Encoder Transformer Language Model for Maithili Text Classification**: Established a benchmark in this language. First to create a corpus in Devanagari Maithili language, trained LLM for Maithili, and performed downstream task classification. Tech: LLM, Transformer(bert), Pytorch, Streamlit & Big Data. (April '2024)
- **IRB (Image Recognition Based) Robotics Arm (Image Processing, Signal Processing, Actuator Control)**: Research-oriented, open-source project under UN's SDG3 - Good Health & Well-Being. Tech: Python, Arduino Programming, Arduino Toolkit, TensorFlow (May '2020).

- **Nepali Language Projects**: Developed multiple applications, including a Devanagari letter classifier using VGG16 (accuracy 0.94), a Nepali sentiment analysis model, and a simple OCR for Nepali text. Tech: Keras, Transformer, Pytorch, TF-IDF, NLTK. (Past 2 Years)
- **Unsupervised Model**: Explored the behavior of latent spaces using VAE, GAN, C-GAN, AC-GAN, and DC-GAN. Tech: Python, Numpy, TensorFlow. (Sep, 2021)
- **NEPSE Simple**: Presented Nepal stock market data in a minimal environment constraint. Tech: GitHub Workflow, Automation in Scraping, WebSockets, JavaScript, RSS, XML. (Since 2020)
- **Advanced Document and AI Systems**: Designed and implemented a variety of tools, including:
  - Chat systems for Nepali and multilingual documents with Preeti-to-Unicode conversion and guardrails for improved user interaction.
  - AI-powered memo creation and advanced Excel file manipulation tools.
  - Contract document analysis using recursive and advanced reasoning GPT systems.
  - Translation systems for Nepali documents using OCR and text conversion.
  - Chat and interaction systems for image and audio data with TTS and Whisper integration.
- **Verification and Financial Prediction Systems**: Developed:
  - A face and signature verification app using VGG-based advanced face detection and liveness detection algorithms.
  - A loan eligibility prediction system utilizing knowledge-based reasoning techniques.

Honors and Awards

- Winner of GritFeat AI Hackathon 2023, Locus - Feb, 2023,(SWIFT' is a wearable devices with hardware and AI models that detect falls in elderly people with 0.7986 accuracy, resulting in immediate emergency alerts to contacts.)
- First RunnerUP of Dataverse, Locus - Jan, 2023,Dataverse Solution (NLP pased problem to classify abstract.)
- Winner of Best AI Project of Deltathon, DELTA 3.0 - Jan, 2022,Nepali Harvest (Designed a portal to help farmers that can predicting diseases, identifying optimal harvest times, and aiding with crop health assessment.)
- Winner of Image Challenge, IT-Meet UP KU - Sep, 2022 (Have to train AI model to classify image of Ballot paper.)
- Winner of Capture The Flag, LogPoint - Feb, 2021 (Tasked of finding information and exploiting a binary file.)
- Runner's Up at DATARUSH by DOCSUMO - Feb, 2021 (NLP based model for classifying Abstract into Classes.)

Social Experience

- **Joint Secretary at NTBNS Student Clubs, IOE, Pulchowk Campus** — Lalitpur, Nepal
  Conducted technical training & Organized nepal largest sarswati puja Program. — *Jan 2020 - Present*
- **Tutor of Children In Technology- WorldLink** — Nepal
  Aware the student about Risk and Safety of Internet. — *Nov 2023*