Bigyan Aryal

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OBJECTIVE

Aspiring AI researcher with strong foundations in deep learning and neural network architectures. Experienced in implementing models from scratch and studying research papers to understand architectural design principles and training dynamics. Skilled in PyTorch-based experimentation, validation analysis, and modular model development. Interested in contributing to research on modern machine learning systems, efficient architectures, and scalable AI solutions.

EDUCATION

Bachelor of Engineering (B.E) - Computer Engineering 2023 – 2027
Paschimanchal Campus, Institute of Engineering, Tribuvan University
Pokhara, Nepal

SKILLS

Languages: Python, C, C++

Libraries: PyTorch, NumPy, Scikit-learn, Pandas, Open-CV, FastAPI, Seaborn, Matplotlib

Machine learning: Feature Engineering, Optimization, Modeling, EDA, Natural Language Processing, Computer Vision.

Tools: Git, Github, VS Code, Jupyter Notebook, Conda, Docker

Soft Skills: Problem-Solving, Communication, Mass Presentation, Team Collaboration.

INDEPENDENT RESEARCH

ImageNet Classification with Deep Convolutional Neural Networks (AI Bootcamp Research Paper Study)

- Analyzed **AlexNet** architecture: **layers**, **ReLU**, and training strategies.
- Studied design choices such as **depth**, **stride**, and **GPU parallelization**.
- Applied those learnings in **MNIST** dataset.

Attention Is All You Need (Independent Research Paper Study)

- Implemented **Transformer** from scratch based on **Attention Is All You Need**.
- Built **attention**, **masking**, and **positional encoding** modules.
- Trained the model on **Tiny Shakespeare** Dataset for 3 epochs.
- Evaluated training dynamics using validation loss trends.
- Its named **Shakespeare-GPT**.

PROJECTS

Image Captioning Model *Github repository link*

- Fusion of **Computer Vision** and **Natural Language Processing**.
- Uses **CNN** (**Resnet50**) as encoder and **RNN** as decoder.
- Wrapped the model using **FastAPI**.
- Containerized the model using **Docker**.
- Deployed the container to **Azure** Container Registry.

Shakespeare-GPT *Github repository link*

- Implemented **transformer** model using **PyTorch**.
- Built each module separately, **embeddings**, **positional encoding**, **multi-head attention**, **feed forward network**, **residual and normalization layer** and so on.
- Wrapped the model using **FastAPI**.
- Containerized using **Docker**.

RAG-based Research Assistant *Github repository link*

- Implemented **RAG-based** approach for talking to a **chatbot** with knowledge of almost **500k+** research papers.
- Research papers were taken from **arxiv** dataset.
- Converted **500k+** research papers into **embeddings** and stored in **FAISS** vector database.
- The **gpt-oss-120b** LLM was used as the brain of the system.

AWARDS AND ACHIEVEMENTS

- **National Level 48 hour Hackathon: VectorHack 2026, Winner**
  Awarded for the project **'NeuroRead',** A mobile app for **dyslexic** people to improve their ability of **phonemic** awareness. Uses **finetuned BART** model for dyslexic friendly **summarization** of study materials.
- **OpenStreetMap(OSM) Hackfest, Runner Up (2026)**
  Awarded for the **NightTime Route Planner Mobile App**, Integrated with ML model that highlighted safer areas based on the **OpenStreetMap** data combined with synthetically generated data
- **Call For Enthusiast ML Mentor (2026)**
  Mentored juniors of my college in the **Machine Learning** field. Including **data cleaning**, **data preprocessing**, **EDA**, **feature engineering**, **model building**, and **model evaluation**. Deep Dived into the core of Machine Learning throughout this **month-long** mentorship.