Aashish Ghimire

Software Engineer

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EDUCATION

MS in Computer Science | University of South Dakota | May 2025 | GPA: 4.0

BE in Computer Engineering | Tribhuvan University | Jun 2022

Relevant Coursework: Data Structure and Algorithm, Object-oriented analysis and design, Distributed System, Database Management, Computer Vision, Big Data, Probability and Statistics, Linear Algebra.

EXPERIENCE

Graduate Research Assistant | University of South Dakota | Vermillion, SD | Jan 2024 - Present

- Conducted advanced research on deep learning model design, achieving a 15% increase in CNN robustness through innovative architectures, along with research on applications of computer vision algorithms like Shape-context.
- Trained and optimized deep learning models on Lawrence HPC infrastructure, using parallel computing (CUDA, PyTorch DDP) reducing training time by 35% and enabled efficient scaling of experiments across multiple GPUs.
- Performed comprehensive literature reviews, synthesizing insights from 50+ research papers for experimental designs.
- Developed the various deep learning model pipelines and reproducible workflows with Git and MLflow, contributing to the publication of research papers in the prestigious IEEE conferences.

Associate Software Engineer | Intelzy Softwares | Chitwan, Nepal | Aug 2021 - Jul 2023

- Developed and maintained 20+ scalable RESTful APIs using Django REST framework, reducing API response times by 30% using Redis caching and asynchronous views.
- Created automated unit and integration tests using Pytest, improving backend code coverage and reliability.
- Improved developer onboarding via detailed API documentation using Swagger/OpenAPI and Postman collections.
- Collaborated with cross-functional teams to deliver end-to-end e-commerce solutions by integrating backend technologies with PostgreSQL and optimizing database queries leading to 40% improvement in application load time.
- Partnered with clients to gather detailed requirements, resulting in on-time project delivery that increased customer satisfaction by 35%.

PROJECTS & PUBLICATIONS

Enhanced Model Robustness by Integrated Local and Global Processing | Computer Vision, PyTorch | Full Article

- Published in 2024 IEEE 6th International Conference on Cognitive Machine Intelligence (CogMI).
- Developed a CNN architecture combining Convolutional Block Attention Modules (CBAM) and Optimized Non-Local Blocks to improve robustness, using PyTorch for model development and MLflow for tracking experiments and managing training metrics, achieving 1.5%-10.5% performance improvements on CIFAR-10, CIFAR-10-C, and Imagewoof datasets.

RAG Chatbot | Python, FastAPI, ElasticSearch, React | Link

- Developed a domain-specific chatbot using Retrieval-Augmented Generation (RAG) with Large Language Models (LLMs) for 3 domains integrating Elasticsearch for efficient retrieval and React for the UI.
- Implemented vector embedding pipeline with all-MiniLM-L6-v2 for document processing and queries, enabling efficient semantic search to retrieve top-k relevant documents for GPT-2-Medium response generation.

Blogging Web App | Python, Django, HTML/CSS, Javascript | Link

- Developed a fully functional blogging platform using Django(template based), implementing user authentication, password management, and profile management, supporting multiple concurrent users.
- Designed and integrated features including post creation, editing, deletion, category management, like/unlike functionality, and a search feature, reducing content retrieval time by 30%.

SKILLS

Languages: Python, C/C++, SQL, Javascript, Java
Frameworks: Django, Flask, FastAPI, LangChain
AI/ML and Data Science: Numpy, Pandas, OpenCV, PyTorch, MLflow
Database: MySQL, PostgreSQL, Elasticsearch, Firebase, SQLite
Tools: Git/Github, Docker, Bash, Postman, Selenium, Pytest, BeautifulSoup, HPC(GPU Clusters)

PARTICIPATIONS

- **NSF I-Corps Winter 2025**: Completed a one-month training program, conducted 20+ interviews on feasibility study and requirements engineering of AI-based liver cirrhosis detection models.
- **IdeaFest 2024**: Two-day event held at University of South Dakota, participated in an individual oral presentation.