Sushmita Rai

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EDUCATION

East Tennessee State University   *Johnson City, TN*
M.S. in Computer Science   *May 2027 (Expected)*

Kathmandu Engineering College   *Kathmandu, Nepal*
B.S. in Computer Engineering   *Dec 2016 – Sept 2021*

PROFESSIONAL EXPERIENCE

East Tennessee State University   *Johnson City, TN*
Graduate Teaching Assistant   *Aug 2024 – present*

- Led lab sessions and provided academic support for 126 undergraduate students in foundational and advanced programming courses including AI and Machine Learning, improving coding and problem-solving proficiency.
- Conducted code reviews, assisted with curriculum delivery, and enhanced student outcomes through structured feedback and project-based learning.

Optible AI   *Adelaide, Australia*
Machine Learning Engineer   *Sept 2022 – Jul 2025*

- Developed an AI system with a Question Answering(QA) model for criteria matching and a ranking algorithm for final score calculation, automating grant proposal reviews with 99% accuracy and reducing assessment time by 90% across 6 major providers.
- Fine-tuned a T5-based QA model with feature engineering, and confidence-aware inference, improving validation accuracy to 86.34%.
- Implemented a ranking and weighted scoring algorithm on top of QA outputs, producing client-specific scores aligned with criterion importance and business rules.
- Conducted EDA on unstructured text to design preprocessing strategies, boosting Named Entity Recognition (NER) accuracy by 90% and improving insight extraction
- Led a team to implement an end-to-end pipeline for data loading, preprocessing, model training, and versioning, improving automation and reproducibility.
- Built an AI agent to onboard new clients for grant assessment, reducing setup time from 8.5 hours to 30 minutes by automatically generating criteria, sub-criteria, and yes/no validation questions from guidelines PDFs.

Fusemachines Nepal Pvt. Ltd.   *Kathmandu, Nepal*
Machine Learning Engineer Associate   *Apr 2021 – Aug 2022*

- Designed and deployed a Virtual QA Assistant for Time Magazine to combat COVID-19 misinformation, integrating DistilBERT for fast passage retrieval and RoBERTa for accurate answer extraction within a Haystack pipeline, combined with Rasa for dialogue and MLOps best practices.
- Collaborated with Presto (US drive-thru automation company) to build a voice-based food ordering system using Automatic Speech Recognition (ASR) and Natural Language Understanding (NLU), improving operational efficiency.
- Designed and delivered Conversational AI training for 60+ employees within 3 weeks; facilitated 100+ fellows in Fusemachines AI Fellowship.
- Built and deployed a content management API using Django REST Framework on AWS EC2.

SKILLS

Programming: C, C++, Python, Javascript

App Development: Django, Flask, FastAPI, .NET, Streamlit

Machine Learning: Keras, Tensorflow, Scikit-learn, Pytorch, Pandas, Seaborn, Numpy, Rasa, Spacy, Transformers, LLM (Large Language Models), HuggingFace, XGBoost

Database: PostgreSQL, MySQL, MongoDB, Elasticsearch

MLOps: Git, Docker, AWS, GCP, Mlflow, Metaflow, Airflow, Containerization

Technical Skills: Machine Learning, Natural Language Processing, Information Retrieval, Computer Vision, Prompt Engineering

PROJECTS

Customer Churn Prediction   *Jul 2021*
Tools: Streamlit, scikit-learn, XGBoost, Docker, FastAPI

- Built a predictive modeling application for customer churn; applied feature engineering, supervised learning, and ensemble methods to achieve 87% prediction accuracy.

DERMYSOL (Skin Disease Identifier)   *Mar 2021*
Tools: TensorFlow, Keras, Django, IBM Watson Assistant

- Developed a computer vision application for skin disease detection using transfer learning with fine-tuned VGG16 model. Applied image augmentation, hyperparameter tuning, and optimizer experiments to achieve 77.64% accuracy.

CERTIFICATIONS

- AWS Certified Machine Learning Specialty, Rasa Developer Certificate, Machine Learning, MLOps & Advanced Computer Vision (Coursera).