Deepak Kandel

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Summary

Artificial intelligence and data science practitioner with hands-on experience in image processing, computer vision, and machine learning from research & development to production. Currently, I am experimenting with developing novel Bayesian algorithms to estimate uncertainty, incorporate self-awareness, and support continual/lifelong learning for streaming data to address real-world computer vision problems. Besides lab work, I like experimenting with training and fine-tuning Large Language Models (LLMs) on customs datasets.

Education

Doctor of Philosophy (Ph.D.), Imaging Science **Aug 2022 — Present**

Chester F. Carlson Center For Imaging Science, Rochester Institute of Technology Rochester, NY, U.S.A.

- **Courses**: Image Processing & Computer Vision, Deep Learning

Bachelor's Degree, Electronics & Communication Engineering **Nov 2015 — Sep 2019**

DoECE, Pulchowk Campus, Institute of Engineering, Tribhuvan University Pulchowk, Lalitpur, Nepal

- Merit-based 4-year scholarship
- **Courses**: Artificial Intelligence, Data Mining, Mathematics (Calculus, Linear Algebra, Probability & Statistics, Numerical Methods, Discrete Structures)

Research Interests

Continual Learning, Large Language Model (LLM), Bayesian Learning, and Uncertainty Estimation

Work Experience

Graduate Research Assistant **June 2023 — Present**

Rochester Institute of Technology, Rochester, NY, U.S.A.

- Experimenting with variational inference for lifelong/continual learning

Graduate Teaching Assistant **Aug 2022 — May 2023**

Rochester Institute of Technology, Rochester, NY, U.S.A.

- GTA For Probability & Statistics with Python
- GTA For Fundamentals of Imaging Science

Machine Learning Engineer **Dec 2020 — July 2022**

Evolve Kathmandu, Bagmati, Nepal

- Designed and developed a Multi-Store-Multi-Item demand quantity prediction system using ARIMA, prophet, Temporal Fusion Transformer, and LightGBM
- Developed the product recommendation engine for FMCG products using Autoencoders and LightFM
- Developed in-house outlet localization and Automatic Route Generator (ARC) API based on geo-location for optimized distribution of goods

Data Scientist **Mar 2020 — Dec 2020**

Docsumo Kathmandu, Bagmati, Nepal

- Information retrieval from tax, invoice, and bill documents and digitization of non-digital PDF (bank statements, W2, & W9) forms using advanced OCR techniques
- Contributed to face recognition system for verification of documents with Indian driving license [KYC for banks and Insurance companies]
- Improving the image quality: skewness detection, correction, and enhancements with computer vision and image processing
- Developed and deployed the AI applications in Google Cloud Platforms

Data Science Intern **Oct 2019 — Feb 2019**

Neoteric Lalitpur, Bagmati, Nepal

- Sales Data Analysis, Weekly Sales Revenue Estimation using Deep-AR and ARIMA, Market Segmentation
- Laptops Brands Classification using Transfer Learning

Technical Coordinator & AI Fellowship Instructor **May 2018 – Feb 2019**

LOCUS Lalitpur, Bagmati, Nepal

- Introduced attendees to python, Conda environment, NumPy, matplotlib, and pandas for data interpretation and visualization
- Project demos on face recognition system and CNN-based MNIST handwritten digit recognition
- End-to-end implementation of iris flower classification and titanic survival prediction served with RESTful APIs

Projects

- Training and Fine-Tuning Large Language Model (LlaMa-2) for NeurIPS Large Language Model Efficiency Challenge
- Assessment of U-Net for Brain Tumor Segmentation with Gaussian Noise on Training Data
- Book Recommendation System based on Hybrid Methods of Matrix Filtering
- Instance Segmentation of Buildings using Deep CNN For Paint Color Visualization
- Near-Real Time Objection Recognition using Pre-trained Deep Neural Network
- Sentiment Analysis of Google Play applications reviews with Fine-Tuning of BERT
- Digital Image Halftoning and Removal Using Fast Fourier Transform
- MRI Image Denoising using Markov Chain Monte Carlo and Non-Local Means

Technical Stacks

Programming	python
Deep Learning / Computer Vision	TensorFlow, PyTorch
LLM and Gen AI	LlaMa-2, RAG, LangChain, Prompt Engineering
Machine Learning	scikit-learn, NumPy, pandas, matplotlib, SciPy
Image Processing	OpenCV
Project Management	Gitlab, Jira, Confluence
Miscellaneous	LaTeX, Cloud Computing, Git, Bash, Flask, Docker

Awards & Honors

Scholarship/Assistantship for Ph.D.

- Received merit-based scholarship at RIT to pursue Ph.D. in Imaging Science

Full Scholarship for Undergraduate Studies

- Government-funded 4-year Scholarship For Engineering Studies (4% acceptance rate)

Training's & Crash Course

Data Analytics & Machine Intelligence (DAMI) **Jan 2019**

- 15-day workshop organized by ICTC Center, Institute of Engineering (IoE), Pulchowk Campus, in association with IIT Delhi

Kickstart for AI & Machine Learning **Jan 2018 - Jun 2018**

- Took part in the workshop by AI Dev Nepal to get a kickstart on the basics and AI and Machine Learning

Workshop on Set Farm **Jan 2018 - Jun 2018**

- Workshop on set farm Nepal for intelligence in farming & agriculture with robotics, organized by Purwanchal Campus Dharan, Pulchowk Campus, Nepal, & Washington State University, USA