Prajwal Thapa

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Research Interest

My broad research interests are:

- Enhancing decision-making transparency and real-world applicability of AI systems through advanced computer vision and interpretability techniques.
- Investigating LLM generalization, causal inference, and in-context learning to improve adaptability and robustness in AI applications.

Education

Department of Artificial Intelligence, Kathmandu University — Kavrepalanchok Nepal
Master of Technology in Artificial Intelligence. *2022-2025*

- Thesis Title: "Crop Recommendation and Agricultural Query Answering Based on Weather and Soil Analysis". Thesis research under the supervision of Asst. Prof. Dr. Yagya Raj Pandeya
- Semester Projects:
  - "AQI (Air Quality Index) Prediction with IoT sensors". Semester Project under supervision of Prof. Dr. Sudan Jha
  - "Job Recommender Using Candidate's Resume". Semester Project under supervision of Prof. Dr. Bal Krishna Bal
  - "Crop Calendar". Semester Project under supervision of Prof. Dr. Yagya Raj Pandeya

Institute of Science and Technology, Tribhuvan University — Kathmandu, Nepal
B.Sc. in Computer Science and Information Technology. Percentage 66.69% *2020*

- Major Project Title: "Job Recommendation System". Research project under the guidance of Er. Umesh Dahal.

Research Experience

IRIIS (Institute for Research and Innovation in Intelligent Systems) — Kathmandu, Nepal
AI Researcher

- Research and improve the capability of AI and LLMs to understand and generate Nepali language. Explore model interpretability, build fair and reliable benchmarks, and contribute to better performance and understanding on underrepresented languages.
- Writing research and white papers, as well as technical blogs, and presenting the research at academic and industry forums to help drive AI research efforts locally and globally.
- Develop experimental AI systems, datasets, and prototypes for research ideas to demonstrate them concretely. Build and host lightweight web tools/demos for the institute to test hypotheses, measure models, and facilitate collaborative research.

Research Experience

Directorate of Research, Development and Innovation, Kathmandu University. Kavrepalanchok, Nepal
Acting Director: Associate Prof. Brijesh Adhikary

- Worked on a research project of ICIMOD (International Centre for Integrated Mountain Development) called **Late Blight Prediction** a common disease on crops like potato, tomato etc.
- Supervised Undergraduate minor projects, conducted various seminars on current trends and practices in Artificial Intelligence

Research Experience

Information and Language Processing Research Lab (ILPRL) Kavrepalanchok, Nepal
Advisor: Prof. Dr. Bal Krishna Bal

- Collected the largest Nepali text corpus (27.5GB)
- Pre-trained BERT, RoBERTa, and GPT-2, exclusively for the Nepali Language, and performed instruction tuning.
- Introduced the first-ever GPT-2 (decoder model) for the Nepali Language.
- Enhancing Natural Language Understanding (NLU) benchmark, adding Sentiment Analysis, Conference Resolution, Acceptability Judgments, and Paraphrase Detection to the NepGLUE benchmark.
- Developing the first-ever Natural Language Generation (NLG) benchmark for Nepali Language, including Summarization and Question Answering (QA) datasets.

Publications (Published)

Thapa, P., Nyachhyon, J., Sharma**,** M., & Bal, B. K. Development of pre-trained transformer-based models for the Nepali language. CHiPSAL Workshop, COLING 2025.

(Published) Harish C. Bhandari, Roshan Subedi, Kumar Lama, Yagya Raj Pandeya, Rajendra Dhakal, Oshin Sharma, Rojina Shakya, **Prajwal Thapa**, Bauram Chaudhary Spatio-Temporal Graph Neural Networks for Late Blight Disease Forecasting. Earticle 2025.

(Accepted) ,Nyachhyon, J., Sharma**,** M., **Thapa. P.** & Bal, B. K. Consolidating and Developing Benchmarking Datasets for the Nepali Natural Language Understanding Tasks IJCNLP-AACL 2025

(Arxiv) **Thapa, P.**, Sharma, M., Nyachhyon, J. & Pandeya, Y. Nepalese Herbs Classification using various Deep Learning Algorithms.

(In Prep.) **Thapa, P.** & Pandeya, Y. Crop Recommendation and Agricultural Query Answering Based on Weather and Soil Analysis. NCAA (Planned).

Industry Experience

Virtly IT & Business Solutions Sarl (ICEBRKR) Lalitpur, Nepal
Mid - Level ML Engineer *February to September 2024*

- Fine-tuned various deep learning models, including BART, MobileLLM, and Pegasus, to generate concise and accurate summaries of chat conversations, enhancing user experience and information retrieval.
- Developed and implemented sophisticated algorithms to identify and resolve scheduling conflicts, proposing new time slots that are optimal for all participants.
- Leveraged Phi-3 to design and deploy a task prioritization system, ensuring efficient workflow management and resource allocation based on task urgency and importance.

Industry Experience

Readytowork corp. Tokyo, Japan
Software Engineer *September 2022 to February 2024*

- Project management and requirement discussions with clients.
- Building responsive websites and reusable components in ReactJS.
- Website development using NextJS and TypeScript.
- Designing and integrating RESTful APIs for seamless backend communication.
- Ensuring full-stack functionality by collaborating on backend development using Node.js and Express.

Truemark Technology Tokyo, Japan
Associate Software Engineer *December 2020 to September 2022*

- Web development with React Js
- Using Django rest api framework in Backend
- Writing and Developing maintainable, clean and scalable code

Skills

Programming Language: Python, C/C++, JavaScript, Typescript, JAVA
Frameworks and Libraries: PyTorch, TensorFlow, Scikit-Learn, JAX, FastAPI, Django, ReactJS, NodeJS, FastAPI

References

Prof. Dr. Bal Krishna Bal

- Associate Dean, Kathmandu University
- Professor of Department of Computer Science and Engineering, School of Engineering, KU
- Email: bal@ku.edu.np

Prof. Dr. Sudan Jha

- Lead Researcher, IoT R&D Lab, Kathmandu University
- Professor of Department of Computer Science and Engineering, School of Engineering, KU
- Email: sudan.jha@ku.edu.np

Asst. Prof. Dr. Yagya Raj Pandeya

- Artificial Intelligence Program Coordinator (Graduate)
- Assistant Professor of Department of Computer Science and Engineering, School of Engineering, KU
- Email: yagya.pandeya@ku.edu.np