

Prashant Raj Bista

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Education

Tribhuvan University, IOE, Thapathali Campus Apr 2021 – Apr 2025
B.E. – Electronics, Information and Communication Engineering
Aggregate: 69.9% (First Division)
AI Fellowship 2024 | *Fusemachines Nepal* | [Certificate](#) Apr 2024 – Oct 2024
Relevant Coursework: Communication System, Wireless Communication, Digital Signal Processing, Antenna and Propagation, RF and Microwave Engineering, Electromagnetics, Filter Design, Probability and Statistics, Control System, Engineering Mathematics I–III

Research Experience

DeepSC-S: Semantic Communication for Speech (reproduction) | *PyTorch, Weights & Biases* [Github](#) | [Weights](#)

- Reproduced DeepSC-S ([arXiv:2012.05369](#)): neural speech transceiver trained end-to-end over AWGN, Rayleigh, and Rician channels
- Trained on Edinburgh DataShare speech with random SNR 0–20 dB; reached 7.5–10.5 dB SDR on AWGN with under 1 dB matched-vs-mismatched channel gap at 20 dB
- Documented every underspecified design choice against the authors’ reference implementation; published checkpoints and a five-stage staged write-up

ADJSCC: Wireless Image Transmission (reproduction) | *PyTorch, CIFAR-10* [Github](#) | [Weights](#)

- Reproduced “Wireless Image Transmission Using Deep Source Channel Coding With Attention Modules” ([arXiv:2012.00533](#))
- Confirmed the paper’s central claim: SNR-conditioned attention lets a single model track the upper envelope of fixed-SNR baselines (33.12 dB PSNR at 10 dB vs 29.57/31.66 dB)
- Released weights, evaluation CSVs, and an interactive result viewer with a paper-vs-reproduction deviation table

Nepali-to-English Speech Translation with Prosody Preservation | *wav2vec 2.0, mBART, F5-TTS* [Github](#) | [Thesis](#)

- Undergraduate thesis, supervised by Er. Kshetraphal Bohara: end-to-end speech-to-speech pipeline translating Nepali audio to English while preserving tone, stress, and rhythm
- Fine-tuned wav2vec 2.0 for Nepali ASR and mBART for translation; achieved WER 0.41 and SacreBLEU 38.84

Research Trainee May 2025 – Aug 2025
Nepal Research and Collaboration Center (NRCC) [Review Paper](#)

- Trained in research methodology and academic writing; authored a five-year review paper on SLAM and drone autonomy

Publications

Mechanical Automation with Vision: A Design for Rubik’s Cube Solver May 2024
Proceedings of the 15th IOE Graduate Conference, Vol. 15 (ISSN 2350-8914) [Paper](#)

- Developed a low-cost mechanical system that solves the 3x3x3 Rubik’s Cube
- Used YOLO for cube face detection and a custom mechanism for solving

Professional Experience

Associate Software Engineer Dec 2024 – Jun 2026
Azminds Services · Full-time · Kathmandu, Nepal

- Built a RAG chatbot answering queries from multiple sources: databases, PDFs, and web search
- Developed backend systems and data-scraping pipelines using Databricks and Apache Spark
- Delivered client demos for chatbot-style AI applications

Junior AI Engineer

Jun 2025 – Jun 2026

IdeaBoxAI · Outsourced through Azminds Services · Remote

- Built FastAPI microservices for a multi-tenant AI platform with credit-based usage metering, Redis caching, streaming, and Langfuse observability
- Developed a demand forecasting product on ClickHouse and LangGraph pipelines, training time-series models for demand planning, shipment-delay prediction, and supplier ranking
- Shipped an LLM app comparing multilingual packaging-label PDFs with OCR extraction

Personal Projects

LLM Misuse Monitor | Python, FastAPI, SQLite, Docker, Streamlit

[Github](#) 

- Built async monitoring service flagging jailbreaks, prompt injection, and PII leakage in self-hosted LLM traffic
- Designed cross-session risk-scoring engine that catches slow-burn misuse missed by single-message filters
- Integrated Llama Guard 3, Presidio, and LLM Guard as pluggable detectors
- Prototyped white-box detection from model logprobs; shipped with triage dashboard and Docker deployment

Volunteer Experience

Electronics and Computer Community Amidst Students (ECAST)

Jul 2022 – Apr 2025

- Served as Software Coordinator (Jul 2022 – Jul 2023), Vice President (Jul 2023 – Jul 2024), and Consultant (Apr 2024 – Apr 2025)

Technical Skills

Research Areas: Deep Learning for Wireless Communication (Semantic Communication, Deep Joint Source-Channel Coding, Channel Modeling)

Machine Learning & AI: Generative AI, LLM-based Systems, XGBoost, YOLOv8, PyTorch

Scientific Computing: NumPy, SciPy, MATLAB, GNU Octave

Programming: Python, C++, C

Data Analysis: Pandas, PostgreSQL, SQLAlchemy

Experimentation & Prototyping: Weights & Biases, LangChain, LangGraph, Streamlit, Jupyter

Academic & Research Tools: LaTeX, Git, Linux, Bash

Cloud Platform: AWS

Languages: Nepali (native), English (IELTS scheduled for 27 August 2026), Hindi