

SATISH BAJAGAIN

Lalitpur, Nepal

satishbajagain@gmail.com · [Portfolio](#) · [Learning notebook](#) · [GitHub](#)

RESEARCH INTERESTS

I am interested in learning from brain signals, particularly generalization across individuals in neural decoding. My EEG sleep-stage study explored this question, and I would like to pursue related work in temporal modeling and brain-computer interfaces (BCIs).

EDUCATION

B.Sc. Computer Science and Information Technology

Tribhuvan University — Kathford International College of Engineering and Management

2022–2026 · Kathmandu, Nepal

- **85.14% aggregate, Distinction; above 80% in all eight semesters.** Tribhuvan University awards Distinction at 80% or above in aggregate.
- **Relevant coursework:** Artificial Intelligence; Design and Analysis of Algorithms; Mathematics I & II; Statistics I & II; Numerical Method; Simulation and Modeling; Data Warehousing and Data Mining; Theory of Computation.

SCHOLARSHIPS AND ACADEMIC HONORS

Merit (Jehendar) Scholarship — full undergraduate tuition

Kathford International College, under Tribhuvan University guidelines · 2022–2026

- **My tuition was fully covered throughout all eight semesters.** I earned the first award through the entrance exam and the next seven through my semester results.
- Ranked first among male students in my Kathford B.Sc. CSIT cohort in the entrance exam and semesters I–VII.
- Received academic book awards for seven consecutive semesters and Kathford’s recognition as the best-performing B.Sc. CSIT student for the second year. [Certificate summary and scholarship policy](#)

RESEARCH EXPERIENCE

Generalization across people in EEG sleep-stage classification

Independent research · 2026 · Internal final evaluation completed; publication pending

Python, PyTorch, NumPy, SciPy, scikit-learn · [Study overview](#)

- Tested whether neighboring EEG segments help predict sleep stages for people not seen during training, compared with a model using only the current segment, on Sleep-EDF Expanded (Sleep Cassette).
- Implemented signal preprocessing, 30-second segmentation and five-stage label mapping; kept each person’s recordings together throughout development and final evaluation to prevent subject leakage.
- Compared spectral-feature logistic-regression baselines, a compact convolutional network, matched current-segment and temporal-context heads, and temporal decoding controls.
- Fixed the methods before evaluating held-out people; analyzed person-averaged macro-F1, per-stage errors, bootstrap uncertainty and performance around sleep-stage transitions.
- Completed internal evaluation within one source cohort, including offline models using future context. Publication, external-cohort validation and deployment remain pending.

SELECTED IMPLEMENTATION AND EDUCATIONAL WORK

GPT from scratch — character-level decoder transformer

Completed learning implementation · 2026 · PyTorch · [Notebook and code](#)

- Implemented character tokenization, token/position embeddings, causal multi-head attention, residual decoder blocks, feed-forward layers and layer normalization, with AdamW training and autoregressive generation.
- Completed autograd, makemore and GPT study following Andrej Karpathy’s Zero to Hero, with annotated code and handwritten derivations.

Neural-network learning collection and interactive explanations

[Learning collection](#) · [Interactive models](#)

- Published seven annotated notebooks, six focused notes, an EEG essay, eight concept lessons and three interactive models: backpropagation, a leaky integrate-and-fire neuron and EEG frequency analysis.

PROFESSIONAL EXPERIENCE

HOPMEDS HEALTH TECH PRIVATE LIMITED

Full-Stack and Machine Learning Engineer

May 2026–present · Lalitpur, Nepal

- Build radiology software, including study worklists, image-viewing interfaces and the backend services that connect them.
- Work with PACS (picture archiving and communication systems), DICOM image storage and retrieval, Orthanc and OHIF Viewer.
- Develop medical-imaging preprocessing, training and evaluation pipelines; coordinate model experiments with the software team.
- Build Python/FastAPI services to make model inference available to the application.
- Contribute to PharmHops pharmacy-management software across frontend, backend, databases and deployment, including Node.js, Express and PostgreSQL.

Niyalo Creatives Pvt. Ltd.

Full-Stack Web Developer

October 2025–April 2026 · Kathmandu, Nepal

- Developed client-facing applications across frontend, backend, REST APIs, databases and deployment workflows using JavaScript/TypeScript.
- Contributed software for UR Field Lab, a climate and disaster-risk research event, and e-commerce infrastructure. This role included my eighth-semester academic internship.

Avana Game Studio LLC

Game Developer

May 2023–February 2026 · Remote, USA-based organization

- Developed algorithmic systems in C and Python for pitch detection, MIDI comparison, pattern detection, similarity analysis and real-time audio processing.
- Built player-performance data processing and visualization, gameplay physics and 3D simulation systems.

Game Development Intern

October 2022–April 2023 · Remote

- Worked on a guitar-learning game with pitch detection and real-time audio processing, and a turn-based multiplayer ship-combat simulator.

TEACHING AND MENTORING

Git and GitHub workshop — instructor and organizer

Kathford International College · 2024

- Taught students to manage repositories, branch and merge code, and work together through pull requests.

Frontend web development workshop — co-instructor and co-organizer

Kathford International College · 2024

- Co-organized and taught a practical introduction to frontend web development for undergraduate developers.

TECHNICAL SKILLS

- **Programming:** Python, C/C++, JavaScript/TypeScript; additional experience with C#, Go.
- **Machine learning and analysis:** PyTorch, scikit-learn, NumPy, SciPy, pandas, Matplotlib; neural networks, convolutional models, decoder transformers, model training and evaluation.
- **Signals and research methods:** EEG preprocessing, spectral features, physiological time series, temporal modeling, person-disjoint evaluation, per-stage analysis and bootstrap uncertainty; audio pitch detection and similarity analysis.
- **Medical imaging and systems:** DICOM, PACS workflows, Orthanc, OHIF; FastAPI, Node.js, Express, PostgreSQL, Docker, GNU/Linux, CUDA/GPU workflows.
- **Research and development tools:** Git/GitHub, Jupyter, LaTeX and GDB. Currently studying spiking neural networks and biologically inspired computation.