Saurav Bastola

Computer Engineering Graduate · AI/ML Researcher

bastolasaurav32@gmail.com · +977-9865431299 · Kathmandu, Nepal

LinkedIn · GitHub · Website

Education

Bachelor of Engineering in Computer Engineering *Nov 2019 – Apr 2024*

Pulchowk Campus, Institute of Engineering, Tribhuvan University First Division (78.3%)

- Achieved all Nepal **Rank 43** in entrance examinations among approximately 18,000 candidates
- **Relevant Coursework:** Data Structures & Algorithms, Discrete Mathematics, Artificial Intelligence, Computer Networks, Database Management Systems, Software Engineering, Computer Graphics, Digital Signal Processing, Operating Systems, Big Data Analytics

Standardized Test Scores

GRE: 336 (Quantitative 170 · Verbal 166 · AWA 3.5)

IELTS: Overall 8.0 · Reading 9.0 · Listening 8.5 · Speaking 7.0 · Writing 7.5

Research Experience

Research Assistant *Nov 2024 – Present*

NAAMI · Supervisor: Dr. Binod Bhattarai

- Implementing GENIE (Generative Interactive Environments) framework for medical imaging applications, adapting video-trained models to healthcare domains
- Developing novel synthetic data generation pipeline for Spatial Proteomics (IMC images) using Diffusion Models—first successful application to complex multi-channel proteomics imaging
- Investigated epigenetic biomarkers in cord blood samples from diabetic pregnancies to identify potential autism risk factors through comprehensive statistical analysis

Publications

Surgical Vision World Model. Saurabh Koju, **Saurav Bastola**, Prashant Shrestha, Sanskar Amgain, Yash Raj Shrestha, Rudra P. K. Poudel, and Binod Bhattarai. *Workshop on Data Engineering in Medical Imaging, MICCAI 2025* *arXiv:2503.02904v1*

Extractive Nepali Question Answering System. Yunika Bajracharya, Suban Shrestha, **Saurav Bastola**, and Sanjivan Satyal. *KEC Journal of Science and Engineering, vol. 9, no. 1, pp. 95–102, 2025.* *DOI*

Professional Experience

Associate Game AI Developer *June 2024 – Sep 2024*

Bhoos Games

- Designed and implemented Reinforcement Learning agents from first principles, including deep RL algorithms (DQN, PPO, DDPG, SAC, A3C) for autonomous gameplay across multiple multi-turn strategy games
- Implemented Monte Carlo Tree Search (MCTS) and Information Set MCTS for improved decision-making in partially observable game environments
- Integrated self-play training pipelines and adaptive AI systems in the Company's game engine
- Collaborated with cross-functional teams to optimize AI performance and align agent behavior with game design requirements and player experience goals

Teaching Experience

Workshop Instructor – Software Engineering *2023*

LOCUS, Pulchowk Campus 8th Semester

- Conducted comprehensive software engineering workshop during LOCUS, Nepal's largest tech festival
- Covered software development methodologies, design patterns, and best practices

Workshop Instructor – Competitive Programming *2022*
ECAST, Thapathali Campus 6th Semester

- Designed and delivered workshop on competitive programming algorithms and problem-solving techniques
- Taught data structures, algorithmic paradigms, and optimization strategies

Workshop Instructor – C Programming & Git *2021*
IT Club, Pulchowk Campus 4th Semester

- Conducted beginner-level C programming workshop for incoming students, covering fundamentals and programming best practices
- Led Git version control workshop, teaching collaborative development workflows and repository management

Selected Projects

SB-AIframework [Reinforcement Learning]
Comprehensive RL algorithm testbed supporting multiple environments (OpenAI Gym, PettingZoo) with implementations of PPO, DQN, and A3C. Includes benchmarking suite for comparing algorithm performance across diverse task categories. *Technologies: RL, Python, PyTorch*
Links: GitHub

Nepali Question Answering System [Natural Language Processing]
Fine-tuned MuRIL model on Nepali dataset to create an extractive question answering system for low-resource language processing. *Technologies: Python, Transformers, NLP*
Links: GitHub · Publication

Gandiv [Programming Language Design]
Complete interpreter for custom programming language featuring lexer, parser, and runtime environment built from scratch. *Technologies: C++, Language Design, Compilers*
Links: GitHub

Apollo | DungeonRush [Game Engine Development]
A 2D game engine built with Entity Component System (ECS) architecture, used to develop a complete 2D platformer game. *Technologies: C++, ECS*
Links: GitHub

Technical Skills

Programming Languages: Python, C/C++, JavaScript, SQL, Clisp, MATLAB
Machine Learning: Reinforcement Learning (PPO, DQN, ISMCTS), Deep Learning (CNNs, RNNs, Transformers), Generative Models (GANs, Diffusion Models), Natural Language Processing
Frameworks: PyTorch, TensorFlow, NumPy, Pandas, FastAPI, Lightning, WandB
Tools: Git, Docker, Emacs, Vim, Linux, shell scripting, ssh, SLURM

Awards & Achievements

- **International Mathematics Olympiad 2019:** Selected among top 6 students to represent Nepal at IMO in Bath, United Kingdom (120+ participating countries)
- **Nepal Physics Olympiad 2019:** Selected among top 25 students nationally for International Physics Olympiad training
- **Programming Competitions:** First Runner-Up at Yomari CodeCamp 2022 and Locus CodeJam 2021
- Full merit based scholarship to study Bachelor's in Computer Engineering in **Pulchowk Campus, Institute of Engineering**