Saiman Dahal

Ph.D. student, Graduate Research Assistant, Washington State University

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saiman dahal | saimandahal

Education

Ph.D. in Computer Science Jan 2024 – present
Washington State University

- GPA: 3.9/4.0
- **Research:** Combinatorial ML applications, High-performance architectures
- Adviser: Prof. Ananth Kalyanaraman

Pullman, WA, USA

B.E. in Computer Engineering 2017 – 2021
Tribhuvan University

- Percentage: 72%
- **Research:** AI/ML for time series analysis.

Kathmandu, Nepal

Research Interest

- Combinatorial machine learning applications.
- Hardware software co-design for model optimization and energy-efficient training.
- High-performance architectures for accelerating ML applications.

Publications

HpT: Hybrid Acceleration of Spatio-Temporal Attention Model Training on Heterogeneous Manycore Architectures Jan 2025

IEEE Transactions on Parallel and Distributed Systems (TPDS), Accepted, 2025.
Link: https://ieeexplore.ieee.org/abstract/document/10820024

Experience

Graduate Research Assistant *Jan 2024 – present*
School of Electrical Engineering and Computer Science
Washington State University, WA, USA

- Hybrid methodology with hardware-software co-design principles, achieving optimized performance and energy efficiency for ML models.
- Architecture with ReRAM and systolic arrays to accelerate ML workloads.
- Design space exploration to identify optimal configurations for deep learning workloads on custom high-performance architectures.
- Optimized models for genome sequences analysis, addressing unique challenges in biological sequence data.

Graduate Teaching Assistant *Jan 2024 – May 2024*
School of Electrical Engineering and Computer Science
Washington State University, WA, USA

Computer Engineer *Apr 2022 – Dec 2023*
Ministry of Urban Development
SinghaDurbar, Kathmandu, Nepal

Software Developer and Project Supervisor *Jan 2022 - Dec 2023*
Contentio Lab
Kathmandu, Nepal

Job Area: Core Programming, Project Manager, Database

Junior Python Developer *Jan 2020 - Mar 2021*
Prayogshala Technologies
Dharan, Nepal

Instructor *Jan 2019 – Jan 2020*
Hibiscus School
Dharan, Nepal

Job Area: Computer science

Projects

HpT: Hybrid Acceleration of Spatio-Temporal Attention Model Training on Heterogeneous Manycore Architectures *saiman/HpT*

- HpT, a software-hardware co-design to accelerate the training of attention-based models for scientific applications.
- Dynamic training approach using LoRA to switch from full- to low-parameter training.
- Optimized AI architecture and enabling efficient acceleration on PIM platforms.
- Programming language and tools used: Python, Pytorch, NeuroSIM, PEFT, LoRA

Crop Residue Coverage Prediction: Preserving Soil Health *saiman/CropResidue*

- Leveraged computer vision technique to detect and segment crop residue in RGB soil images.
- Deployed the model on an edge device (smartphone) for real-time residue prediction after tillage.
- Programming language and tools used: Python, Pytorch, SegFormer, Onyxx.
- Won **1st place** in the **AgAID Digital Hackathon 2025**, organized by the AgAID Institute.

StockCoder: Stock price prediction using Transformer architecture *saiman/StockCoder*

- Stock closing price prediction using self-attention.
- Programming language used: Python

Your Voice Your Website, Application of NLP in Web Applications.

- Use of Natural Language Processing to realize the voice command consisting HTML tags and attributes provided by user and process the command rendering a website.
- Programming language used: Python

Influencer Node Maximization (INM): Centrality-based influence maximization approach in a network *saiman/INM*

- Implementation of influential maximization algorithm in the Amazon product network to determine the influential products in the graph.
- Programming language used: Python

Technical Skills

Programming languages : Python, C, C++, SQL, PHP, JS, CSS, Liquid

Frameworks/ Libraries : PyTorch, Scikit-learn, Matplotlib, Tkinter

Tools/ Platforms : NeuroSIM, gem5, WordPress, Shopify, LEMP, GitHub

Specialized skills: Transformer architecture, Spatio-temporal analysis, Layer-wise neural network training

Professional Membership

Member: Institute of Electrical and Electronics Engineers, Inc. (IEEE) Member (2024 - present).

Secretary: Nepali Student Association, Pullman, WA, USA (Aug 2024 - present).

Secretary: Technical Student Association Nepal, Dharan, Nepal (Jan 2018 - Feb 2019).

Awards and Recognitions

First Place: AgAID Digital Hackathon 2025
Recognized for innovative contributions in digital agriculture through machine learning-driven semantic image segmentation to enhance precision farming and sustainability.

Judge: ACM Crimson Code Hackathon 2025
Served as a judge for a university-level hackathon, evaluating projects based on innovation, technical execution, and impact.