SHISTATA SUBEDI shiss@uoregon.edu | LinkedIn | GitHub | Leetcode | Website

Ph.D. Student in Computer Science specializing in scalable data structures for decentralized systems and LLM-driven anomaly detection. Currently developing Samurai, a framework that integrates segment trees into Ethereum's state model to enable efficient, verifiable range queries over historical transaction data.

TECHNICAL SKILLS

- **Languages:** Python, C++, Go, Java, JavaScript, TypeScript, SQL
- **AI/ML:** Deep Learning, Transformers (BERT, GPT), LLM Optimization, XAI (SHAP, LIME, Counterfactuals), Model Evaluation & Benchmarking
- **NLP:** Document Understanding, Named Entity Recognition (NER), Sentiment Analysis, Topic Modeling
- **Distributed Systems:** Segment Trees, Range Queries, Blockchain Concepts, Decentralized Storage (Research)
- **Databases:** MySQL, MongoDB
- **Tools & Frameworks:** PyTorch, TensorFlow, Git, Postman, LaTeX, Micronaut, Docker

PROFESSIONAL AND RESEARCH EXPERIENCE

Graduate Researcher – Decentralized Systems & Explainable AI

University of Oregon, Eugene, OR *Sep 2024 – Mar 2027*

Decentralized Systems & Data Structures:

- Conducting research on efficient storage data structures for decentralized systems.
- Exploring the use of segment trees to enable range queries over distributed data.
- Aiming to support the scalable retrieval of historical transaction states in decentralized environments.
- Investigating trade-offs in performance, consistency, and storage overhead in distributed architectures.

Explainable AI & Large Language Models (LLMs):

- Researching a novel framework for detecting and explaining anomalies in the behavior of LLMs, focusing on semantic analysis tools and chatbot systems.
- Investigated attention mechanisms, tokenization, and response generation to improve interpretability and transparency in LLM-based systems.
- Conducted a comprehensive review of global and local explainability methods (e.g., SHAP, LIME, counterfactuals) and evaluated their effectiveness for anomaly detection tasks.

Teaching Assistant

University of Oregon, Eugene, OR *Sep 2024 – Present*

- Mentored students in foundational web development, covering HTML, CSS, and JavaScript, focusing on analytical thinking and practical applications.
- Supervised lab sessions, evaluated assignments, and provided personalized feedback, fostering improved comprehension and coding skills.
- Led lectures and hands-on web programming and debugging labs, enhancing students' technical confidence and problem-solving abilities.
- Engaged students in critical thinking, preparing them for more advanced research in computer science.

Software Engineer

Leapfrog Technology Inc., Kathmandu, Nepal *Apr 2023 – June 2024*

- Streamlined the software development lifecycle, reducing project timelines by 20%.
- Optimized RESTful APIs, achieving 30% faster response times and enhancing user satisfaction and engagement.
- Designed and implemented backend APIs for the application using Micronaut.
- Expanded product functionality to meet evolving business requirements.
- Led a team of annotators and improved data labeling accuracy by 25%, significantly reducing false positives in downstream ML models.

EDUCATION

Ph.D. in Computer Science

University of Oregon, Eugene, OR *Sep 2024 – Present*

B.Tech in Computer Science and Engineering

Vellore Institute of Technology, TN, India

Awarded Highest Academic Scholarship *May 2019 – Apr 2023*

PROJECTS

- **Samurai: Slash your decentralized Storage —** *2025 (Ongoing)*
  Built a custom Ethereum state simulator in Go and Geth to enable real-time experimentation with decentralized systems. Modified the world state trie with SegmentRoot and implemented transaction replay to generate verifiable, altered blocks for performance analysis.
- **Aspen Biosciences** — *2023*
  Worked on a comprehensive drug discovery management system for scientists to optimize research and experiment management. Integrated project management, chemistry workflows, and inventory tracking to streamline the discovery pipeline. Utilized data-driven analysis to enhance functionality, contributing to a more efficient scientific research process.
- **Vyaguta ERP System** — *2023*
  Led a project to optimize employee and project management within an ERP dashboard. Conducted SQL database optimization, resulting in a high-performance system that improved productivity and operational efficiency across multiple workflows.

- **VIT Connects** — *2021*
  Designed a cross-platform app using Flutter and Firebase to facilitate interaction, course collaboration, and task management for students and faculty at VIT. Emphasized HCI principles through user personas and usability testing, enhancing engagement and user experience.
- **Time Delivery Problem** — *2020*
  Created a route optimization algorithm for the Traveling Salesman Problem, achieving significant improvements in logistics efficiency. Focused on optimizing route planning within delivery systems, leveraging complex algorithms to reduce operational costs. — CODE

ACADEMIC SERVICE

- **Shadow Reviewer, ACM Internet Measurement Conference (IMC), 2025**
  Participated in the peer-review process by evaluating and providing feedback on submitted research papers under mentorship from senior reviewers.

ACHIEVEMENTS

- **Lokey Award for Graduate Excellence (2024-2025)**
  Selected by the University of Oregon's Department of Computer Science for a merit-based fellowship supporting outstanding incoming Ph.D. students. The award, totaling $6,000, promotes academic excellence and potential for impactful research.

- **Frank Vignola Microgrant — Eugene-Kathmandu Sister City Association (2025)**
  Awarded a competitive $1,500 microgrant by the Eugene-Kathmandu Sister City Association, recognizing outstanding Nepali students at the University of Oregon and supporting their academic and professional development.

- **Full-Ride Scholarship — COMPEX Scheme, Indian Embassy (2019-2023)**
  Earned a competitive, merit-based full scholarship covering tuition and living expenses to pursue a Bachelor of Technology at Vellore Institute of Technology, India.

- **Competitive Programming**
  Solved 160+ algorithmic problems on LeetCode, demonstrating consistent practice in data structures, algorithms, and coding efficiency.

- **Leadership — Vice President, 5th Pillar NGO**
  Led outreach initiatives to introduce technology education in underserved communities, focusing on digital literacy and empowerment through access.