SHISTATA SUBEDI

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PhD researcher in distributed systems, data management, and applied cryptography, developing scalable authenticated storage systems for verifiable historical queries. Experienced in designing new system techniques, implementing research prototypes in Go and C++, integrating storage structures into Ethereum clients, and evaluating latency, throughput, proof-generation cost, and storage trade-offs on real-world workloads. Author of research accepted at SOSP 2026, with additional experience in research artifact evaluation, peer review, and production software engineering.

RESEARCH INTERESTS

Distributed systems; authenticated data structures; blockchain systems; verifiable storage; historical state management; time-travel queries; decentralized ledgers; key transparency; storage and performance trade-offs.

TECHNICAL SKILLS

- **Languages:** Python, C++, Go, Java, JavaScript, TypeScript, React, Rust
- **Cryptography:** Zero-knowledge proofs, Vector commitments, Polynomial commitments, Merkle trees, Range proofs, FFT/NTT-based protocols
- **Systems & Distributed Tech:** Distributed systems, Blockchain protocols, Proof aggregation, Verifiable computation, Authenticated data structures, Range queries, Data replication, Decentralized storage
- **Databases:** MySQL, MongoDB
- **Tools & Frameworks:** Docker, Git, Micronaut, Postman, PyTorch, TensorFlow, LaTeX

PROFESSIONAL AND RESEARCH EXPERIENCE

Graduate Researcher — Distributed Systems and Authenticated Data Structures
University of Oregon, Eugene, OR | Sep 2024 – Present

- Lead the development of Smaran, a system for authenticated historical range queries over blockchain state.
- Design storage structures that integrate historical indexing with cryptographic commitments, allowing clients to verify query results returned by untrusted servers.
- Extend Geth with Ethereum-state instrumentation, replay, and indexing components for processing historical account data.
- Build Go-based system and benchmarking tools to evaluate latency, throughput, proof-generation and verification costs, and storage overhead on real-world workloads.
- Investigate performance and security trade-offs in verifiable storage, distributed state management, and historical query processing.

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

- Led web programming lectures and debugging labs, improving students' confidence in applied problem-solving.
- Supervised lab sessions, graded assignments, and provided targeted feedback to strengthen programming and debugging skills.

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

- Streamlined the software development lifecycle, reducing project timelines by 20%.
- Optimized RESTful APIs to achieve 30% faster response times, improving user experience and engagement.
- Designed and implemented backend APIs using Micronaut to support new product features.
- Expanded product functionality to meet evolving business requirements and customer needs.
- Led a team of annotators, improving data labeling accuracy by 25% and reducing false positives in downstream ML models.

EDUCATION

Ph.D. in Computer Science *Sep 2024 – Present*
University of Oregon, Eugene, OR

B.Tech in Computer Science and Engineering *May 2019 – Apr 2023*
Vellore Institute of Technology, TN, India
Awarded Highest Academic Scholarship

PROJECTS

- **Smaran: Serving Authenticated Time Travel Query —** *2025*
  Lead development of Smaran, a decentralized proof system that makes **blockchain** history verifiable without trusting centralized providers. Design authenticated data structures for historical range queries, integrate cryptographic proof generation with blockchain-style workflows, and build Go-based simulation/benchmarking components to evaluate proof-generation latency, verification cost, and storage overhead.
  Keywords: Ethereum, KZG, Proofs, Authenticated Data Structure, Balance, Range Queries, Golang, Pebble, Concurrency
- **MiniSpanner** — *2025*
  Implemented a sharded-replicated architecture for Apache ResilientDB, running PBFT within each shard and 3PC/PoE (Proof-of-Execution) across shard leaders. CODE
- **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.

PUBLICATIONS, RESEARCH RECOGNITION & ACADEMIC SERVICE

- **Paper Accepted, ACM Symposium on Operating Systems Principles (SOSP) 2026** — "Smaran: Serving Authenticated Time-Travel Queries."
- **Student Research Competition Poster Accepted, ACM SOSP 2026** — "HotSwap: Workload-Adaptive Placement for Authenticated State."
- **Poster Presenter, USENIX Symposium on Operating Systems Design and Implementation (OSDI)** — Presented ongoing research in authenticated storage and distributed systems.
- **Doctoral Symposium Presenter, ACM/IFIP International Middleware Conference 2025** — Selected to present ongoing Ph.D. research on authenticated historical queries.
- **Travel Grant Recipient, ACM/IFIP International Middleware Conference 2025** — Received competitive travel support to attend and present at the conference.
- **Reviewer, IEEE Transactions on Dependable and Secure Computing** — Reviewed research submissions in dependable and secure computing.
- **Shadow Reviewer, ACM Internet Measurement Conference (IMC) 2025** — Evaluated research submissions and prepared reviews under the mentorship of senior program committee members.
- **Artifact Evaluation Committee Member, ACM/IFIP International Middleware Conference 2025** — Evaluated research artifacts for functionality, reproducibility, and consistency with published results.

ACHIEVEMENTS

- **Lokey Award for Graduate Excellence (2024–2025) –** Selected by the University of Oregon's Department of Computer Science for a merit-based fellowship recognizing outstanding incoming Ph.D. students.
- **Frank Vignola Microgrant, Eugene–Kathmandu Sister City Association (2025) –** Awarded a $1,500 microgrant recognizing exceptional Nepali graduate students demonstrating academic and professional excellence.
- **Full-Ride Scholarship, COMPEX Scheme –** Indian Embassy (2019–2023) – Earned a fully funded, merit-based undergraduate scholarship covering tuition and living expenses for studies at Vellore Institute of Technology, India.
- **Competitive Programming –** Solved 160+ algorithmic problems on LeetCode, demonstrating consistent engagement with data structures, algorithms, and programming efficiency.
- **Vice President, 5th Pillar NGO –** Led outreach initiatives to promote digital literacy and provide technology education in underserved communities.