Janeet Bajracharya

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Research Interests

Online Algorithms, Competitive Analysis, Learning-aided Algorithms, Mathematical Optimization in Operations Research, Formal Verification, High-Performance Computing, Auctions and Mechanism Design, Set Theory, and Programming Languages.

Education

B.S. in Mathematics & B.S. Hons. in Computer Science (GPA: 3.89) 2022 - 2026 (Expected)
Washington and Lee University *Lexington, Virginia*

- **Mathematics Courses:** Calculus 1-3, Linear Algebra, Ordinary Differential Equations, Partial Differential Equations, Probability, Combinatorics, Real Analysis, Abstract Algebra, Set Theory, Geometry, Complex Analysis, and Graph Theory.
- **Computer Science Courses:** Introduction to Programming, Data Structures, Software Development, Systems Programming, Computer Organization, Parallel Computing, Neuromorphic Computing, Theory of Computation, Linux Systems, Computer Graphics, Algorithms, Computer Networks, Programming Language Design, and Artificial Intelligence.

Research Experience

Summer Research Scholar 2025
Washington and Lee University *Lexington, Virginia & Remote*

- Was selected for a competitive, fully-funded research program to investigate **Online Scheduling algorithms** with *Dr.Kefu Lu.*
- **Co-authoring a paper** (*in preparation*) **proving a $(1+\varepsilon)$-speed algorithm** that yields a $O(1/\varepsilon^2)$ competitive throughput bound for parallel online scheduling within a Speedup curve model.
- Learned and used the framework for **competitive analysis** and particularly methods of **resource augmentation** to prove reasonable competitive bounds against an adversarial optimal algorithm.
- Investigated theoretical distinctions between the Directed Acyclic Graph (DAG) and Speedup curve models of parallelism; proved key results and analyzed the comparative behavior of scheduling algorithms under different models of parallel execution.
- Prepared and presented a **poster presentation** for the SRS Parents' Weekend Event [October 2025] and the **WLU Science Advisory Board** Poster Session [November 2025], representing the Computer Science Department.

Summer Research Scholar 2024
Washington and Lee University *Lexington, Virginia*

- Was selected in a competitive, fully-funded research program to research **VPN security** and radio frequency communication with a focus on IEEE 802.11 Wi-Fi protocols with *Dr. William Tolley.*
- Completed an intensive study of **computer networking**, equivalent to a full-semester course, within one month.
- Analyzed academic papers on the Great Firewall of China and reviewed C-code used in VPN attacks, adapting techniques for use with software-defined radio (SDR) systems.
- Motivated the idea to a project resulting in an **abstract accepted** by ***Proceedings on Privacy Enhancing Technologies*** (PoPETs).
- Prepared and presented a **poster presentation** for the SRS Parents' Weekend Event [October 2024] and the **WLU Science Advisory Board** Poster Session [November 2024] representing the Computer Science Department.

Professional Experience

Computer Science TA 2023 - 2026
Washington and Lee University *Lexington, Virginia*

- Mentored over **500 hours** for Introduction to Programming, Data Structure, and Algorithms classes, leading in-class labs and holding university office hours.
- Advised peers on projects about software architecture, distribution, and core algorithms.

Operations Consultant & Full-Stack In-House Developer | Summer Intern 2021 - 2024
Canon © Nepal [International Electronics Concern Pvt. Ltd] *Kathmandu, Nepal*

- Designed and implemented a custom full-stack ERP system using REST APIs and SQLite relational databases to manage inventory and track corporate resources for a medium-to-large-scale enterprise. Frontend developed using Svelte; backend powered by Pocketbase.
- Built a managed printing service (MPS) module to monitor over 200 active machines in real time, enabling detailed cost analysis and generating actionable insights for operational optimization.
- Consulting in pricing services based on historic data using Monte-Carlo sampling, and mathematical cost-benefit analysis.

Awards

- *Washington and Lee University*: **President's List 2024-2025**

Skills:

Languages: Python, JavaScript, Go, C, Java, Kotlin, MATLAB, Latex, Typst.
Tools and Skills: Business Analytics/Intelligence, ETLs, Cronjobs, Systemd Services, Bash Scripting, Parallel and Concurrent Computing.

Personal Projects

- Implemented ALGOL-based stable matching algorithms in Python to find Pareto-optimal pairings for a university matchmaking event.
- Real-Time data mining operation with streaming databases for conflict-free analytics.