Spandan Goel

224-864-0314 | spandan.goel914@gmail.com | linkedin.com/in/spandan-goel | github.com/Spandan14

Education

Brown University Providence, RI

Bachelor of Science in Computer Science, Master of Science in Computer Science, GPA: 3.79 *May 2026*

- **Relevant Coursework**: Graduate Operating Systems, Graduate Advanced Computer Graphics, Distributed Systems, Datacenter Operating Systems, Graduate Algorithmic Game Theory, Deep Learning, Computer Networks, Compilers and Program Analysis, FPGA System Design I, FPGA System Design II, Probabilistic Methods, Econometrics
- **Teaching Assistant**: Computer Graphics (Head TA, Fall 2025, ∼150 students), Distributed Systems (Head TA, Spring 2025, ∼65), Graduate Deep Learning (Fall 2024, ∼100), Deep Learning (Spring 2024, ∼400)

Experience

Software Engineering Intern May 2025 – Aug 2025

Ramp *New York, NY*

- Incoming Software Engineering Intern on Ramp's Engineering Platform team

Software Engineering Intern May 2024 – Aug 2024

Amazon Web Services *Seattle, WA*

- Designed EC2/ECS architecture to horizontally scale RAG document ingestion pipelines, increasing capacity by 100x
- Engineered a dynamic routing system, reducing latency by ∼27%, increasing throughput by 3x, cutting costs by ∼20%
- Supported automatic routing strategy adjustments, runtime strategy migration, A/B testing, customer priority levels
- Added new ticketing mechanisms, alarms, metrics to detect failures, automatically apply fixes, minimize blast radius

Software Engineering Intern Jun 2023 – Aug 2023

Amazon Web Services *Seattle, WA*

- Created a React-based semi-structured document (pdfs, images, csvs, etc.) annotation tool for NER Service clients
- Introduced 14 new features to expedite annotations, such as document histories, auto-tagging, and collaboration tools
- Integrated a few-shot-based LLM-assistant to learn and help users in real-time, reducing annotation time by over 65%

Projects

Bare-metal FPGA Tetris | *Verilog, SystemVerilog* Nov 2024 – Dec 2024

- Implemented Tetris entirely in RTL on a Cyclone V FPGA; played with a keyboard at a resolution of 600p at 60Hz
- Designed a PS/2 controller/driver for inputs, memory controllers, VGA signal controllers, and a rendering module
- Created a hardware-level framebuffer system; used less than 5% of FPGA logic elements to implement entire game

Atreides: NUMA-aware, μsecond-scale scheduler | *DPDK, C, C++, Rust, Python* Oct 2024 – Dec 2024

- Built a userspace scheduler atop Caladan, optimizing core allocation to reduce remote node memory access by 60%
- Designed and integrated NUMA-aware congestion control and work-stealing policies, cutting 99th percentile latencies
- Wrote a custom `memcached` running on DPDK-accelerated TCP to show Atreides producing a 10% performance boost

Neural Network-Supported Path Tracer | *CUDA, C++, OpenGL, OptiX, tiny-cuda-nn* Mar 2024 – May 2024

- Implemented a path-tracer with real-time neural radiance caching, optimizing calculations and improving convergence
- Engineered pipeline for concurrent network training and rendering, increasing FPS by 17-32%, image quality by 8-13%
- Enhanced performance with full hardware-acceleration; wrote a compiler to convert PBRT materials into MDL files

Weenix Operating System | *C, Assembly, GRUB, Python* Jan 2024 – May 2024

- Implemented kernel with userspace threading and multiprocessing, virtual memory system, copy-on-write mechanism
- Wrote drivers for terminals, disks, and memory devices; developed a virtual file system with mounting & partitioning
- Shipped a RAM filesystem and the commercial-grade System V filesystem capable of managing disks up to 16 TiB
- Added support for dynamically linked libraries, letting users run many programs, like a terminal-based text editor

Distributed Computing Library & Search Engine | *JavaScript, Bash* Jan 2024 – May 2024

- Formulated a distributed computing engine allowing users to run computationally-intensive tasks on multiple nodes
- Wrote a custom serialization library, RPC system, node groups, gossip protocols, and a sharded network database
- Added a complete MapReduce implementation; delivered an advanced package search engine running on this system

Skills

Languages: Python, C/C++, Assembly, Java, JavaScript, HTML/CSS, Stata, Racket, Dart, OCaml, Rust, CUDA
Frameworks: Flask, Django, React, Flutter, Vue3, NodeJS, Express, Qt, Spring, Redux, DPDK, eBPF
Developer Tools: AWS, Docker, Google Cloud Platform, CloudFlare, MongoDB, Firebase, Unreal Engine 4/5, Blender
Libraries: TensorFlow, pandas, NumPy, Matplotlib, OpenCV, SciPy, jQuery, Quasar, Animate.css, Eigen, OpenGL, OptiX