Ashwattha Phatak

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Education

North Carolina State University - Raleigh, NC   Aug 2024 – May 2026
Masters in Computer Science   **GPA: 3.91/4.0**
Coursework: Adv. Distributed Sys., Operating Sys., Computer Networks, Advanced Robotics, Autonomous Driving
Vishwakarma Institute of Technology - Pune, India   Aug 2019 – May 2023
Bachelors in Electronics and Telecommunication;   **GPA: 8.76/10.0**

Technical Skills

Languages: C++, C, Python, Bash
Operating Systems: Concurrent Programming, Multithreading, Inter-Process Communication (IPC), Socket Programming, Distributed Metadata Replication, Crash-Consistent Journaling
Distributed Systems Concepts: Consistency Models (Strong/Eventual), Leader Election, Consistent Hashing, Quorum Protocols, Vector Clocks
Systems: GDB, Linux Kernel Hacking, Filesystems, Real-Time Scheduling
Infrastructure & Tooling: Docker, Kubernetes, AWS, Git, CMake, QEMU, etcd

Experience

Precision Sustainable Agriculture — Systems Software Intern   Raleigh, NC
May 2025 – Present

- Engineered a real-time system health monitoring API in Flask that aggregated GPS state, camera connectivity, disk utilization, network reachability, SMB telemetry, and data collection metrics into a structured JSON diagnostics endpoint for edge systems.
- Architected and deployed OTA update infrastructure enabling centralized software rollout to embedded Linux platforms across 15 deployed edge systems.
- Refactored ROS1 communication into a lean IPC-based framework, enhancing data throughput, reliability, and maintainability of on-device perception pipelines.

Systems Lab (Dr. Yoon Man-ki) — Research Assistant   Raleigh, NC
Jan 2025 – May 2025

- Extended OpenPCDet to support range image compression and reconstruction (PBEA), enabling exploration of alternative LiDAR data representations for 3D object detection pipelines.
- Benchmarked PointPillars and PV-RCNN models on the KITTI dataset across multiple range image resolutions, measuring inference latency and accuracy trade-offs.
- Quantified detection performance metrics (recall, average precision) for different range image dimensions to identify sensitivity of 3D perception to spatial resolution and metadata embedding.

State Street Corporation — Site Reliability Engineer   Bangalore, India
Jan 2023 – Jul 2024

- Led incident response engineering for hedge ledger applications, coordinating between product owners and core engineering for continuous delivery.
- Built centralized dashboards to visualize infrastructure reliability metrics and support data-informed decision-making during production incidents.

Projects

Semantic Concurrency Control for Shared Multi-Agent Memory   Feb 2026 – April 2026

- Designed a semantic locking protocol to detect logically conflicting writes using similarity-based conflict predicates, enabling concurrency control beyond key-level locking.
- Implemented optimistic commit-time validation and multi-writer coordination mechanisms to prevent semantic race conditions under concurrent distributed workloads.

DeltaFS   Oct 2025 – Nov 2025

- Designed a WAFL-inspired distributed filesystem in C++ with copy-on-write snapshots and crash-consistent journaling.
- Implemented socket-based metadata replication and synchronization logic to maintain consistency under concurrent distributed operations.

Xinu OS — Kernel Development   Aug 2024 – Dec 2024

- Implemented fair round-robin scheduling with priority-aware time slicing, eliminating starvation and improving scheduling fairness under multiprocess workloads.
- Developed demand paging with multi-level page tables, page-fault handling, and frame management to support 4GB virtual memory per process.