Gowthaman Aravindan

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Education

National University of Singapore **Aug 2020 - Jan 2025**

Bachelor of Engineering (Second Major in Computer Science) *Honors (Distinction)*

Relevant Modules: Data Structures & Algorithms | Operating Systems | Computer Organization | Networks | OOP | Machine Learning & AI

Projects **Feb 2025 – Present**

Thread Pool Scheduler 🌐 [github.com/taskium] [C++]
Lock-based thread pool with mutex guarded queues, condition-variable signaling, and **RAII** managed lifecycles for concurrent task dispatch.

Pathfinding Visualizer 🌐 [pathium.gowthaman.app] [Typescript]
Real-time, terrain-aware visualizer enabling side-by-side execution of **A***, **Dijkstra's**, and **BFS** on weighted grids via a custom traversal engine.

Pystring 🌐 [github.com/pystring] [C++]
Lightweight library bringing **pythonic string manipulation** (range-based slicing, negative indexing) to **C++**, enabling cleaner text workflows.

Experience

GovTech (SearchSG) **Aug 2023 – Jan 2024**
Software Engineer Intern *Singapore*
- Revamped DOM parsing and visibility heuristics in the **crawler** and **indexer**, restoring **3,000+** lost metadata fields across **20+** domains.
- Integrated **AWS QuickSight** dashboards with secure embedding, cutting load times from **5s to <1s** by serving precomputed analytics.
- Strengthened **ExpressJS** auth middleware by replacing query-based validation with **JWT** claims, enforcing multi-tenant access control.
- Built schema-driven **React** components for a no-code builder, enabling **50+** agencies to align the search bar with branding guidelines.
- Developed stateless login workflows using **JWT cookies**, enabling persistent user sessions without server-side session management.

Google **May 2023 – Aug 2023**
Software Engineer Intern *Singapore*
- Built a **Java**-based UI tool to surface accessibility diffs via annotated screenshots in pull requests, reducing code review time by **20%.**
- Implemented a **gRPC** pipeline with custom **Protocol Buffer** schemas to automate the extraction of test results from a central database.
- Provisioned and maintained a gRPC server, ensuring continuous system reliability through performance monitoring and alert handling.

Zendesk **Jan 2023 – May 2023**
Software Engineer Intern *Singapore*
- Migrated developer environments from **AWS EC2** to **Kubernetes**, reducing boot time by **70%** and cutting monthly infra costs by **~$5,000**.
- Orchestrated **3** production rollouts by monitoring **Jenkins** pipelines and **Datadog** dashboards to ensure zero-downtime deployments.
- Engineered **GraphQL** mutations in **Java** to route client requests to upstream microservices, ensuring reliability through **JUnit** coverage.
- Deployed an **NLP**-driven Slack bot in **Node.js** that automated developer queries, cutting support noise and speeding up response times.

Kinexcs **Nov 2022 – Jan 2023**
Software Engineer Intern *Singapore*
- Designed and implemented interactive **Flutter** UI widgets from **Figma** prototypes, boosting user engagement by **40%** in usability testing.
- Modeled and deployed scalable **DynamoDB** and **RDS** databases to store user profiles and manage application state for **10,000+** users.
- Developed backend scripts in **Python (Flask)** and containerized test environments using **Docker** to automate end-to-end API testing.

PsyFinance **Mar 2022 – Jul 2022**
Software Engineer Intern *Singapore*
- Redesigned the frontend of a financial dashboard using **Next.js** and **TypeScript**, improving UI responsiveness for **5,000+** monthly users.
- Introduced centralized state management using **Recoil**, improving re-render efficiency and reducing average page load times by **25%.**
- Automated frontend testing pipelines using **Jest** and **CircleCI**, reducing production bugs by over **50%** during a 3-month release cycle.
- Integrated **Amplitude** analytics to monitor site traffic and uncover customer behavior insights, enabling data-driven product decisions.

Technical Skills

Languages: TypeScript, JavaScript, Python, C++, Java, Dart, HTML, CSS

Technologies/Frameworks: React.js, Node.js, Express.js, Flask, PostgreSQL, MongoDB, Flutter, GraphQL, Jenkins

Developer Tools: Docker, Kubernetes, AWS, Vercel, Prisma, Serverless, Git, Linux, Postman