Baalavignesh Arunachalam (He/him)

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EDUCATION

George Mason University — Virginia, United States
Master of Science in Computer Science GPA: 3.78 — August 2024 - Expected May 2026

PSG College of Technology — Coimbatore, India
5 years integrated Master of Science in Software Systems — June 2018 - May 2023

SKILLS

Programming Languages: TypeScript, Python, Swift, SQL, JavaScript, HTML, CSS, C#, C, C++
Technologies: React, Next.js, Node.js, AWS, Terraform, Docker, Kubernetes, CI/CD, NumPy, DevOps

PROFESSIONAL EXPERIENCE

George Mason University — August 2025 –Present
Graduate Research Assistant

- Researching game theory applications using Multi-Agent Reinforcement Learning (MARL) with Python, implementing Q-learning algorithms to model strategic interactions in competitive business environments
- Investigating the Bertrand competition model through experimental simulations to analyze pricing strategies, Nash equilibrium convergence, and market dynamics in oligopolistic scenarios

Motate — May 2025 – August 2025
Software Developer Intern

- Building a serverless multilingual content platform using AWS Lambda/API Gateway, enabling translations across multiple languages with automated scaling, and using step functions with SageMaker for GPU-intensive tasks.
- Automated AWS environments via Terraform/GitHub Actions and optimized DynamoDB schemas with secondary indexes, improving query speeds while maintaining SOLID-coded Lambdas.

Presidio, Inc. — March 2023 – July 2024
Associate Software Engineer

- Developed internal learning platforms and retro tools using React, designing a scalable architecture on AWS with a serverless approach utilizing Lambda, API Gateway, Cognito, and RDS with MySQL for seamless data management.
- Engineered an Award Maintenance platform using Azure AD, React, Lambda, and Node.js with a Microservices architecture. Implemented a CI/CD pipeline with GitLab, streamlining the development process and ensuring faster delivery.
- Contributed to client projects for accessibility, enabling seamless interaction for hearing-impaired users, using WebRTC, React, and Microsoft Azure, delivering robust solutions for web development.

Toast, Inc. — June 2022 – July 2022
Software Developer Intern

- Managed several gigabytes of invoice bills using DynamoDB with Lambda for a serverless solution with authorizers for the REST API through API Gateway for efficient data retrieval and processing.
- Optimized data scans by implementing Local and Global Secondary indexes, reducing overall scan times by 40%. Applied SOLID principles to enhance code maintainability.

CERTIFICATION & ACHIEVEMENTS

- Certified Kubernetes Application Developer issued by The Linux Foundation (CKAD)
- AWS Certified Solution Architect and Cloud Practitioner issued by Amazon Web Services
- HashiCorp Certified: Terraform Associate (003)
- Best Prototype Award - Story3 Hackathon, HackerEarth

PROJECTS

BuyTime
A productivity app that rewards focus sessions with earned screen time using Apple's FamilyControls framework.

- **BuyTime**, a subscription-based iOS productivity app using **SwiftUI** and **Apple FamilyControls** framework to enforce an earned screen-time reward system, implementing **Live Activities**, app restriction shields, and cross-device usage tracking.
- Backend is built using Bun and TypeScript with a RESTful API and integrating Clerk for JWT-based authentication via web-hooks, and a serverless **PostgreSQL** database via Neon, containerized with **Docker** and deployed on Fly.io.

Aegis
An AI agent governance platform acting as a firewall for autonomous agents (LangChain/LangGraph)

- Built a Python **SDK** with @agent and @monitor decorators to enforce three-tier allow/block/review policies via **FastAPI**, with real-time audit logging and a human-in-the-loop approval system backed by MongoDB Atlas.
- Engineered a **React** + **Tailwind CSS** real-time governance dashboard with live activity polling, enabling kill-switch controls, risk scoring deployed end-to-end on Vercel with a serverless **FastAPI** backend.