

# Baalavignesh Arunachalam

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## PROFESSIONAL SUMMARY

Full-stack engineer with 2+ years building serverless cloud platforms (AWS Lambda, API Gateway, DynamoDB) at Presidio and Motate. Shipped ByTime: Time Hub, a solo-built iOS app on the App Store with a SwiftUI frontend and Bun/Postgres backend, live with active users. Live with active users. 3x hackathons recognized. Certified CKAD, AWS Solutions Architect, Terraform Associate.

## EDUCATION

George Mason University	Virginia, United States
Master of Science in Computer Science GPA: 3.70	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

**Languages:** TypeScript, Python, Swift, SQL, JavaScript, HTML, CSS

**Frameworks:** React, Next.js, SwiftUI, React Native, Tailwind CSS, Node.js, Bun, FastAPI, Express

**Cloud & DevOps:** AWS (Lambda, API Gateway, Cognito, DynamoDB, RDS), Docker, Kubernetes (CKAD), Terraform, GitHub Actions

**Databases:** PostgreSQL, MongoDB, MySQL, DynamoDB, Redis, SQLite

## PROFESSIONAL EXPERIENCE

**George Mason University** August 2025 – Present  
Graduate Research Assistant

- Researching game theory applications in **Multi-Agent Reinforcement Learning (MARL)** under Prof. Abhishek Ray (ISOM, Costello College of Business), implementing **Q-learning** algorithms in **Python** to model competitive market dynamics.
- Ran **500+** simulations with **2-agent** configurations to investigate the **Bertrand competition** model, analyzing pricing strategies and Nash equilibrium convergence in oligopolistic scenarios.

**Motate** May 2025 – August 2025  
Software Developer Intern

- Built a serverless multilingual content platform supporting **30+ languages** on **AWS Lambda + API Gateway** with **Step Functions** orchestrating **SageMaker** GPU jobs (**12+ Lambda** functions across the translation pipeline).
- Automated full AWS environment provisioning via **Terraform + GitHub Actions**, replacing manual deployment with single-push CI/CD; optimized **DynamoDB** schemas with secondary indexes, and maintained Lambdas following SOLID principles.

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

- Built an internal learning platform using **React + Node.js + AWS (Lambda, API Gateway, Cognito, RDS with MySQL)** for serverless scaling and authentication. Owned CI/CD pipeline implementation from scratch in **GitLab**.
- Engineered Award Maintenance platform on a **Microservices** architecture (**10+ services**) using **Azure AD**, React, Lambda, and Node.js; designed **multi-cloud** authentication integrating AWS Cognito and Azure AD.
- Delivered accessibility client work, built a **WebRTC** + React flow that adds a sign-language interpreter as an intermediate participant in live calls for hearing-impaired users.

## CERTIFICATION & ACHIEVEMENTS

- Certified Kubernetes Application Developer** issued by The Linux Foundation (CKAD)
- AWS Certified Solutions Architect** issued by AWS and HashiCorp **Certified: Terraform Associate** (003)
- 3x hackathons** recognized: Best Prototype Award — Story3 Hackathon, HackerEarth (+ 2 honorable mentions)

## PROJECTS

**ByTime: Time Hub** | [Available on the App Store](#)

A productivity app on the App Store that rewards focus sessions with earned screen time.

- Architected and built end-to-end: native SwiftUI iOS app and a **Bun/TypeScript** REST backend (28 REST endpoints, 8-table **Neon** serverless **Postgres**) containerized with **Docker** and deployed on **Fly.io** with CI/CD and health checks.
- Integrated FamilyControls, ManagedSettings, DeviceActivity, ActivityKit, WidgetKit, and HealthKit across **5 coordinated system extensions** to power an earned-time wallet: users complete focus sessions to redeem screen time on blocked apps.
- Built standalone **OAuth** (Google + Apple Sign-In) issuing custom **JWTs** with refresh-token rotation and Keychain storage, automated Postgres migrations, and device-ID-based cross-device wallet sync; shipped to **TestFlight** with **10+ active beta testers**.

## Aegis

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

- Built a **Python SDK** with **@agent** and **@monitor** decorators enforcing 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, kill-switch controls, and risk scoring; deployed end-to-end on **Vercel** with a serverless **FastAPI** backend.