Krishnaprasad Palamattam Aji

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EDUCATION

Arizona State University, Tempe, AZ - Master of Science in Computer Science **May 2025**
National Institute of Technology Calicut, India - B.Tech in Computer Science and Engineering, **May 2019**

RELEVANT COURSEWORK

Data Structures and Algorithms, Distributed and Multiprocessing Operating System, Software Engineering, Computer Networks, Software Security, Database Management Systems, Computer Organization, Compiler Design, Software Validation and Testing.

TECHNICAL SKILLS

Languages: Java, Python, Kotlin, C++, JavaScript, TypeScript, C
Backend: Spring Boot, Flask, REST, Kafka, RabbitMQ, gRPC
Cloud & DevOps: AWS, GCP, Docker, Kubernetes, Jenkins, Git, GitOps, Drone, Vela
Databases and Caching: PostgreSQL, MongoDB, MySQL, Oracle, Redis
Testing & Monitoring: Spock, JMeter, Postman, Prometheus, Grafana, Kibana

PROFESSIONAL EXPERIENCE

Research Aide **June 2024 - May 2025**
School of Sustainable Engineering and Built Environment, Arizona State University **Tempe, AZ**

- Developed an AI-driven personal decision support system(AI Mental Modeler) leveraging **React** and **Python**.
- The system models key factors influencing Pecan Area produce, utilizing **EconML** to analyze time series data and compute individual local causal effects within a directed factor graph.
- Deployed the application on a **LunaNode Ubuntu** server using **Nginx** as a reverse proxy and **MongoDB** for data persistence, enabling multi-user access and concurrent model editing. Configured TLS for secure access, optimized backend performance for real-time graph interactions, and ensured scalability for 1000+ concurrent user sessions.

Senior Engineer | Engineer **July 2019 - July 2023**
Target Corporation **Bangalore, India**

- Spearheaded the development of a **Java/Kotlin**-based order management backed by **PostgreSQL**, reducing stuck orders by 60%. Designed and implemented **REST**ful APIs for real-time order tracking and integrated **Grafana** and business intelligence tools for proactive monitoring.
- Redesigned a real-time order processing microservice with scheduled jobs in an event-driven architecture, improving performance by 400% using **Kafka** for event streaming and **PostgreSQL Ultron** database for high-throughput processing. Set up **Prometheus** monitoring, **Grafana** dashboards for observability, and deployed the service to **Target Application Platform** (**TAP**) **Kubernetes** clusters via **GitOps** CI/CD pipelines, integrating automated image builds and Artifactory-based deployments.
- Initiated end-to-end testing automation for microservices across the order life cycle, using JSON payloads to mimic real orders. Developed diverse test suites with **Spock** and **Groovy**, and frontend integration, reducing manual integration testing time by 70%.
- Developed a **Java Spring Boot** microservice using **MongoDB** to schedule hourly order releases to stores and distribution centers based on workforce availability. Enabled intelligent order consolidation to reduce shipping costs and carbon footprint.

PROJECTS

Distributed Banking System with gRPC **Aug 2023 - Dec 2023**

- Built a distributed banking system using **gRPC**, enabling cross-branch transactions (deposit, withdraw, query) and ensuring seamless customer-branch communication and synchronization.
- Implemented **Lamport's logical clock** for global event ordering and enforced **read-your-writes** consistency by routing sessions to the same backend node with synchronized replication, ensuring strong consistency in concurrent cross-branch transactions.

Exploring Routing Asymmetry in FABRIC testbed **Jan 2024 - May 2024**

- Investigated routing asymmetry using Precision Time Protocol (**PTP**) for one-way latency measurement and traceroute for path analysis, identifying and quantifying asymmetric paths in **FABRIC** testbed
- Highlighted the role of routing asymmetry in congestion control and protocol optimization, providing insights for enhancing network performance
- Developed **Python** scripts to automate latency measurements and path analysis, improving the efficiency of network diagnostics.