# ARUNA SENTHAMARAIKANNAN

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## PROFESSIONAL SUMMARY

Software Engineering Graduate Student dedicated to building technology solutions that create social impact. Combines strong technical foundation in Java, Python, React, and Springboot with experience developing AI healthcare systems and enterprise applications

## EDUCATION

**Northeastern University, Boston, MA** Jan 2025 - May 2027
Master of Science in Software Engineering Systems GPA: 4.0/4
*Coursework: Object-Oriented Design, User Experience Design/Testing, Web Design, Data Structure and Algorithm*

**Rajalakshmi Engineering College, Chennai, India**, Aug 2019 - April 2023
Bachelor of Engineering in Computer Science and Engineering GPA: 3.8/4
*Coursework: Cloud Computing, Software Engineering, Database Management Systems, Machine Learning*

## SKILLS

**Programming Languages**: Python, Java, TypeScript, JavaScript
**Frontend Development**: React(Next.js), Angular, RxJS, Responsive Design, Single Page Applications (SPA), Tailwind
**Backend Development**: Spring Boot, FastAPI, Node.js, REST APIs, JUnit, Integration Testing
**Databases**: MongoDB, MySQL, PostgreSQL, Redis, Airtable
**Cloud & DevOps**: AWS (S3, Lambda, EC2), Docker, Kubernetes, Jenkins, CI/CD, Terraform
**Development Tools**: Git, GitHub Actions, Jira, Postman, API Documentation, Code Reviews, Agile/Scrum
**Architecture & Design**: Microservices, Hexagonal Architecture, System Design, API Design, BFF patterns

## EXPERIENCE

***Assistant Civic Researcher*** July 2025 - Present
**Northeastern University, Boston, MA**

- Architected and developed automated evaluation system using Airtable REST APIs, JavaScript, and custom scoring algorithms, reducing manual assessment time by 70% and standardizing data collection workflows across cross-functional program initiatives
- Applied Computer science concepts to debug 10+ critical UI/UX issues through structured testing protocols and version control, partnered with software engineering team to implement technical fixes, refactor React components, while ensuring WCAG 2.1 accessibility compliance

***Graduate Research Assistant – AI/ML Engineer*** May 2025 - Present
**Northeastern University, Boston, MA**

- Led research team of 3 developers and deploy scalable Python FastAPI REST APIs on AWS with Swagger UI documentation, processing 500+ daily medical records and integrating LLM-based diagnostic models achieving 85% accuracy in edge-case triage analysis
- Designed and implemented automated evaluation pipelines using Python, MongoDB and CI/CD workflows to compare AI diagnostic models against doctor-confirmed results, enabling performance monitoring and automated ICD-11 classification with 24-hour refresh cycles
- Collaborated with doctors and clinicians to define research objectives and validation methodologies for medical diagnosis workflows, translated clinical requirements into experimental software specifications while managing iterative development cycles and version control

***Graduate Research Assistant - Frontend Developer*** Feb 2025 - May 2025
**Northeastern University, Boston, MA**

- Developed and enhanced responsive React TypeScript web application with reusable UI component library and interactive data visualizations using modern frontend frameworks, implementing user research methodologies and A/B testing to optimize user experience
- Architected chatbot interface using Figma and built scalable frontend components following atomic design patterns, integrating state management and API endpoints to streamline academic application workflows where 85% of users rated the interface as ”good” or ”excellent”

***Software Engineer*** Jan 2023 - Dec 2024
**Trimble Inc, Chennai, India**

- Developed high-performance enterprise transportation applications using Java, Spring Boot, Hibernate and REST APIs with Angular frontend, integrated Server-Sent Events (SSE) for real-time data streaming achieving 35% API latency reduction in production environment
- Architected Spring Boot microservices with hexagonal architecture and Backend-for-Frontend pattern, implementing gRPC/Protocol Buffers for geospatial map rendering and navigation, with Apache Kafka for event-driven messaging between legacy and modern applications
- Built test cases using JUnit and Postman for endpoint validation achieving 75% code coverage, gained experience with application deployments through Jenkins pipelines, Terraform infrastructure-as-code and Docker containerization
- Collaborated across Design, QA, and DevOps teams using Agile methodologies with Jira for sprint planning, gathered stakeholder requirements and translated business objectives into technical specifications while mentoring 2 junior developers through Bitbucket

## PROJECTS

**Movie Bookmark Web Application** (GitHub) React, SpringBoot, SQL

- Built responsive full-stack application using Java Spring Boot and React TypeScript, optimized real-time search functionality with algorithm enhancement and caching strategies enabling instant filtering across movie datasets without browser refreshes
- Constructed scalable RESTful APIs with MySQL query optimization (indexes, JOINs), server-side pagination, and connection pooling; implemented secure authentication using Google OAuth 2.0 and JWT

**MBTA+** (Figma) UX/UI Design, System Design

- Redesigned MBTA transportation payment system using data-driven UX principles (Fitts’s Law, Hick’s Law) and implementing virtual tap-to-pay and monthly pass integration while reducing navigation complexity by 25% through user research and WCAG accessibility compliance
- Prototyped interactive features with real-time functionality including live bus arrival times, stop locations, crowd level indicators, and route planning optimized for mobile platforms, conducted usability testing and data-driven analysis to validate design decisions

## PUBLICATIONS

Mobile Application Development of Tourist Management Using Ant-Colony Optimization Algorithm. AIP Conference Proceedings, 3175, 020019. DOI Link