Vaishnavi Dathrak

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With a combination of a master's degree and professional experience equating to over 5 yearsI specialize in creating scalable, secure, and customer-centric solutions using Java, Spring Boot, and cloud technologies. My expertise includes building microservices architectures, optimizing workflows, and delivering security-driven applications. Notable accomplishments include leading the modernization of monolithic systems into distributed microservices, developing ChallengeApp, a cloud-hosted web application deployed on AWS and implementing robust authentication systems with Spring Security and OAuth2. I thrive on solving complex problems, streamlining processes, and aligning technical solutions with customer needs. By integrating tools like Docker, Kubernetes, PostgreSQL, and distributed tracing technologies, I've ensured high system reliability and performance. I am passionate about innovation and eager to contribute to the team's mission to deliver exceptional customer experiences globally.

Education

University of Colorado Denver – Aurora, CO January 2023 - December 2024
Master of Science – Computer Science GPA: 3.79
Guru Nanak Institute of Technology, Hyderabad, India August 2017 – May 2021
Bachelor of Technology – Computer Science GPA: 3.17

Skills

Programming & Development: Java, C, C++, JavaScript, Spring Boot, React.js, Angular, NodeJS, REST APIs, Git, Postman, Testing Documentation

Databases: PostgreSQL, MySQL, NoSQL

Networking: LAN/WAN technologies, TCP/IP protocols, network troubleshooting, OSI and TCP/IP models, subnetting, routing and switching protocols, VLAN configurations, firewalls, VPNs, IDS/IPS, access point configuration, DHCP/DNS management, and diagnostic tools (Wireshark, traceroute, ping)

Tools & Technologies: Robotic Process Automation, Business Optix, SS&C Blue Prism, Customer Relationship Manager tools, UiPath, Docker, AWS (Elastic Beanstalk, S3, RDS), Kubernetes, AWD Chorus, CI/CD tools like Jenkins, Jira, Process Test Automation Framework for Testing

Security: IT Security Policies, Spring Security, JWT-based authentication, Vulnerability Assessments, Secure Configurations, Troubleshooting, Technical Support, Customer Service, Project Management, Agile Methodologies

Work Experience

SS&C Technologies Inc Hyderabad, India

Senior Software Engineer - Business Process Management Developer & Implementations consultant *September 2021 – January 2023*

- Engineered a robust client-centric application using **Java** and **JavaScript** with **PostgreSQL** and **Angular** for frontend development, automating processes with AWD Chorus and Blue Prism, enabling clients to streamline their tasks without building automation from scratch.
- Developed a PostgreSQL-based application for efficient data extraction, manipulation, and mining, enhancing data handling capabilities.
- Proficient in SQL for advanced data processing and analysis, specifically in detecting and preventing fraudulent activities through sophisticated queries and alerts. Conceived and implemented a frontend interface using **React**, integrating with backend services through **REST APIs**, to create a cohesive user experience and robust functionality.
- Leveraged Robotic Process Automation (RPA) tools, including UiPath and SS&C Blue Prism, alongside Docker, to automate repetitive tasks, enhancing operational efficiency and accuracy while reducing costs. Blue Prism's scalability and seamless integration capabilities further improved workflow and ensured regulatory compliance across the organization.
- Applied UML modeling to create and document automation workflows, promoting clear communication and uniformity in RPA solutions, which resulted in smoother process automation and minimized manual mistakes.
- Implemented secure configurations using **Microsoft System Center Configuration Manager (SCCM)** to optimize software deployment and update processes, ensuring compliance with organizational IT standards and security protocols.
- Conducted vulnerability assessments and applied security patches, leveraging **O365 security tools** to monitor and mitigate potential threats, enhancing overall system security. Acted as a liaison between development teams and clients, translating client needs into development tasks, ensuring clear communication and alignment through the **Business Optix tool.** Managed client interactions to gather comprehensive requirements, present project updates, and set expectations, ensuring project deliverables meet client needs.
- Worked closely with QA teams to establish test cases and verify application functionality across varied user environments. Performed manual and automated tests to identify and log bugs, and created scripts to validate APIs, supporting secure and precise data handling in PostgreSQL-driven applications.
- Developed system enhancements by anticipating future organizational requirements and incorporating user feedback, which led to a **20% boost in user adoption rates.** Utilized Microsoft **System Center Configuration Manager (SCCM)** to optimize software deployment and update processes across enterprise settings. Automated application rollouts, ensured prompt update installations, and tracked deployment progress with comprehensive reporting. Enhanced IT infrastructure management by leveraging SCCM to adhere to organizational IT standards and security protocols, ensuring efficient and secure operations.

Disability Resources & Services at UC Denver Denver, Colorado

Assistive Technology & Testing Assistant II *September 2023 - December 2024*

- Assisted students with disabilities improve their learning experiences by providing assistive technology support with JAWS, NVDA, Dragon NaturallySpeaking, Kurzweil 3000, Read&Write, OneNote, and Sonocent. Supported **Blackboard** and **Canvas** learning management systems, ensuring effective use of these web-based platforms for accessing course materials, submitting assignments, and facilitating online learning.
- Trained colleagues and students on the use of various software applications, including **Spring Boot** for web development and **REST API** development in Java, focusing on application setup, configuration, and best practices.
- Developed and deployed an **audio transcription** app using Spring AI and OpenAI to convert speech to text. Configured and integrated OpenAI's API, set up backend and frontend, and designed CSS for a polished UI. Conducted thorough testing to ensure functionality and accuracy, showcasing expertise in API integration, frontend development, and application testing.
- Supported software testing, troubleshooting, and debugging to enhance accessibility and usability of learning tools, applying web development and REST API principles. Conducted accessibility tests to ensure compliance with assistive technology standards, documenting issues and collaborating on resolutions.
- Resolved technical issues related to software applications, web development environments, and RESTful services, providing hands-on support for troubleshooting and optimizing performance. Customized settings and provided tailored guidance to meet individual needs, such as configuring development tools, adjusting accessibility features, and integrating assistive technologies. Enhanced accessibility and learning outcomes by applying web development and REST API principles to ensure that software applications were usable and effective for a diverse user base.

projects

Spring Security project with JWT Authentication: Spring Boot, Spring Security, JWT, Spring Data JPA, custom filters, UserDetailsService, RBAC, and security annotations to implement JWT-based authentication and secure user management.

- Developed an understanding of JSON Web Tokens (JWT) and their use in securing RESTful services. Developed a project on JWT-based authentication, including the creation of custom JWT filters, utility classes, and security configurations to manage token validation and user authentication seamlessly.
- Designed and implemented custom user models and repositories to handle user data and roles in a Spring Security environment. Configured `UserDetailsService` and `UserDetailsManager` to integrate custom user models, allowing for flexible and extensible user management. This included mapping user roles to authorities, managing password encryption, and ensuring that user details are securely handled throughout the authentication process.
- Implemented role-based access control within Spring Security, configuring custom roles and permissions to manage access to different parts of an application. Leveraged in-built annotations like `@PreAuthorize` and `@Secured` to enforce security rules at both the method and controller levels. Gained experience in setting up hierarchical roles, ensuring that users with higher-level roles inherit the permissions of lower-level roles, and applied method-level security to restrict access to specific functionalities.
- Applied security best practices to configure secure Spring Boot applications. This included setting up security-related properties, managing session policies to prevent session fixation attacks, and ensuring stateless authentication for RESTful APIs. Emphasized the importance of regular security reviews, proper configuration management, and adhering to secure coding standards to mitigate risks and maintain the integrity of the application.

The To-Do List App project: Java, Android Studio, Firebase Realtime Database, Firebase SDK

- entailed creating an Android application with Java and Android Studio. We used Firebase Realtime Database for data storage and built a customized authentication system with the Firebase SDK.
- My goal was to create a user-friendly task management system that enables users to efficiently set reminders, with a focus on user-centered design. This emphasis on ease of use was intended to improve the overall user experience by making task management intuitive.
- The project emphasized innovation and adaptability while developing the app. It greatly enhanced my technological abilities in mobile app development, real-time data management, and secure authentication processes. This initiative not only resulted in a functional and practical application but also built a solid platform for the future.

Job Application Systems: Java**,** Spring Boot, Angular, H2/PostgreSQL

- Successfully used the Spring Boot framework to convert a monolithic application to a microservices architecture.
- Initially employed H2 database for development. Migrated to PostgreSQL using Docker containers, orchestrated through Docker Compose scripting.
- Implemented RestTemplate for inter-service communication. OpenFeign was upgraded to streamline and improve service-to- service communication.
- Eureka Server was used to establish a Service Registry. Developed a thorough understanding of the Heartbeat Mechanism to guarantee reliable service health monitoring.
- Zipkin was utilized to implement distributed tracing, which was then deployed on Docker containers to improve performance monitoring and troubleshooting.
- Set up Spring Cloud Gateway to efficiently route and manage traffic among microservices.
- Enhanced resilience and dependability by implementing circuit breaking and fault tolerance within the job application microservice.
- Obtained expertise in Kubernetes for managing and orchestrating containers.

ChallengeApp: Spring Boot, React.js, JPA, H2, JWT-based authentication, and on AWS using Elastic Beanstalk, S3, and RDS.

- Built a web application using Spring Boot for the backend and React for the frontend, focusing on CRUD operations, service layer implementation, and integration with a relational database using JPA and H2.
- Created robust RESTful APIs for the application, handling various HTTP methods and integrating them with a service layer to ensure proper data handling and business logic execution.
- Developed the frontend using React, leveraging components, states, and props to create a dynamic user interface that communicates seamlessly with the Spring Boot backend.
- Successfully deployed the ChallengeApp to Amazon Web Services (AWS) using Amazon RDS for the database, Elastic Beanstalk for backend deployment, and S3 for serving the frontend, ensuring a scalable and secure cloud-based environment.
- Configured Cross-Origin Resource Sharing (CORS) to enable the frontend and backend to communicate securely, facilitating smooth integration and data exchange between the two layers.
- Incorporated Bootstrap into the application to enhance the frontend design, providing a responsive and modern user interface.\

Spring Boot and React-based AI Chat and Image Generator using OpenAI APIs: Spring Boot, OpenAI APIs (GPT, DALL·E), React.js, Postman, AWS S3, Spring Security, Java, JavaScript, Environment Variables

- Integrated OpenAI APIs in a Spring Boot application for chat and image generation services, utilizing GPT and DALL·E models. Implemented secure API key storage using environment variables and managed API requests with Postman.
- Developed a RESTful **chat service** using Spring Boot to send user queries and retrieve AI responses via OpenAI's GPT model
- Built an **AI image generation** service leveraging OpenAI's DALL·E, incorporating custom parameters for image creation and asynchronous processing.
- Created an AI-based **recipe generator** using NLP models to generate personalized recipes based on user input and preferences
- Developed a React.js frontend with dynamic rendering for chat responses and generated images, utilizing state management and conditional rendering. Resolved **cross-origin resource sharing (CORS)** issues by configuring Spring Security and enabling secure communication between React.js frontend and Spring Boot backend.
- Utilized **AWS S3** for storing and retrieving generated images, ensuring efficient cloud storage and accessibility.

Secure IoT Communication System: Tools and Technologies: Python, Flask, Cryptography, PyCryptodome, Matplotlib, Seaborn, MQTT, HTTP/3 (QUIC), SSL/TLS.

- Developed a comprehensive protocol for **secure IoT data transmission** leveraging Elliptic Curve Cryptography (ECC), AES-CFB encryption, and HMAC to ensure data confidentiality and integrity.
- **Implemented key exchange mechanisms** using ECC and **HKDF** for dynamic symmetric key generation, providing robust protection against quantum computing threats.
- **Simulated secure communication** via **MQTT with TLS/SSL** and **HTTP/3 with QUIC**, demonstrating reliability and scalability in IoT networks.
- **Designed threat mitigation strategies** for **Man-in-the-Middle (MitM)** and replay attacks, showcasing advanced cybersecurity expertise.
- **Optimized encryption performance** for resource-constrained IoT devices, achieving an effective balance between security and system efficiency.
- **Configured dynamic key management** and end-to-end encryption, enabling secure multi-device communication in diverse IoT environments.
- **Visualized performance metrics** such as encryption overhead, latency, and transmission speed using **Matplotlib** and **Seaborn**, providing actionable insights for further optimization. **Integrated SSL/TLS certificates** for secure channel establishment and demonstrated adaptability for future cryptographic enhancements.