PRANAV AGRAWAL

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EDUCATION

Master of Science in Computer Science | George Mason University | Fairfax, Virginia | GPA: 3.8/4 | **May 2024**

Bachelor of Technology in Computer Science and Engineering | Graphic Era University | Dehradun, India | GPA: 8.5/10 | **May 2018**

PROFESSIONAL EXPERIENCE

Application Development Senior Analyst | Accenture | Bangalore, India   **May 2021 - July 2022**

- Implemented a micro-service to track user activities by decoupling user events from the API server using ActiveMQ, achieving a peak performance of recording **500 events** per second.
- Created a cronjob that processes 6.5 million events scheduled on a daily basis, to track completed milestones.
- Used batch job results to update multiple tables using Spring Transaction Management for strongly consistent updates.
- Achieved a speedup of **0.3x**, reducing batch processing time by 15 minutes, by implementing parallel data processing with Spring Batch and optimized database queries using indexing and query refactoring.
- Enhanced the **scalability** of the API Server by implementing horizontal scaling with AWS Auto Scaling and Elastic Load Balancing, enabling the system to handle a **50%** increase in user activity without performance degradation.
- Incorporated industry-leading tools like SonarQube to uphold code quality; Jenkins, Docker & Kubernetes for streamlined continuous integration and deployment, and managing the services efficiently.

Project Engineer | Wipro Limited | Bangalore, India   **Nov 2018 - May 2021**

- Migrated onboarding and claims processing services from monolith to microservice architecture with Enterprise Service Bus [ESB] integration to enable message transformation, protocol mediation and **intelligent routing**.
- Implemented AWS KMS and Vault for cloud data encryption, ensuring **secure storage** of sensitive information.
- Automated log retrieval to efficiently route statistics and events logs to Splunk for improved **monitoring & logging** capabilities.
- Updated Red Hat JBoss Fuse Enterprise Service Bus routes and deployed OSGi bundle on Apache Karaf to maintain high standards of software reliability and robustness.
- Conducted comprehensive unit testing using Junit and Mockito frameworks, achieving a code coverage of **90%** to ensure proper application functionality and correctness.

RESEARCH EXPERIENCE

Graduate Research Assistant | CEC - George Mason University | Fairfax, VA   **May 2023 – May 2024**

Security of Cross-chain Bridges

- Developed Python scripts to scrape the transaction data from 8 cryptocurrency blockchain bridges concurrently, resulting in a **30%** improvement in resource utilization.
- Optimized API requests in parallel batches asynchronously for efficient data extraction, including logs and ERC20 token details.
- Automated transaction data upload to MongoDB (NoSQL) for improved accessibility of transaction data in a particular timeframe to identify **security vulnerabilities** in cross-chain operations like reentrancy attacks and unexpected state changes.

Ethereum Consensus Client Diversity Identification and Verification

- Developed python codes to capture Ethereum consensus client attestation rewards data using Lighthouse beacon node APIs.
- Performed **feature engineering** on the data observed from the beacon node using Ratcliff-Obershelp distance and Spearman correlation coefficient to find similarity amongst same consensus clients.
- Developed and trained robust **classification** machine learning model (kNN) to precisely classify diversity of various consensus clients to understand proper decentralization, reduced single points of failure and client domination.

TECHNICAL PROJECT EXPERIENCE

Student Survey Application | Code | Video |

- Developed Java based microservices applications using Spring Boot, RESTful Web Services, and JPA along with Amazon Relational Database Service (RDS) to implement CRUD operation to manage student survey data, and a user-friendly interface using Angular.
- Containerized the application using Docker and deployed to container orchestration platform Kubernetes, established using Rancher.
- Established a **CI/CD** pipeline that includes a Git source code repository at GitHub, and Jenkins for automated build and deployment of the application on Kubernetes.

TECHNICAL SKILLS

Programming Languages, Tools, & Frameworks: Java, Python, JavaScript, Bash, Maven, Jenkins, Git, Docker, Kubernetes, Rancher, Spring framework, Spring Boot, Angular

Web Technologies & Services: HTML, CSS, XML, JSON, REST API

Database Management: SQL Server, MySQL, Oracle 11g, MongoDB

Additional Skills: Agile, JIRA, AWS, CI/CD, Linux

CERTIFICATION

AWS Certified Solutions Architect – Associate @Verify