Zumaad Khan

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EDUCATION

Northeastern University, Boston, MA   ***B.S. in Computer Science***   **Sept 2017 - May 2022**

EMPLOYMENT

HubSpot   **Software Engineer co-op**   **July - December 2020**
- Member of the Content Platform team responsible for rendering and serving HubSpot's customer CMS content, receiving billions of monthly views
- Optimizing CMS content delivery performance by prerendering and caching static content to prevent redundant rendering
- Improving cache invalidation by detecting changes in the content dependency graph and purging all affected content
- Decoupling micro-service architecture by eliminating software dependencies and migrating service communication to REST APIs
- Utilized: *Java, Dropwizard*

TripAdvisor   **Software Engineer co-op**   **July - December 2019**
- Worked on the cybersecurity team responsible for analyzing and handling billions of events a day across TripAdvisor internal and external network infrastructure
- Migrated production cybersecurity pipeline handling 40k events/sec from RabbitMQ to Kafka and built a library to abstract pipeline interactions
- Increased pipeline throughput by 25% by creating a library that offered optimizations such as asynchronous message processing for consumers, thread based parallelism, and a task queue system
- Developed an automated response system for security alerts responsible for resolving or escalating security issues
- Built notification service that aggregated all in-house messaging services
- Developed interactive graph-based UI to help other business units investigate which emails failed security validation.
- Utilized: *Python, Kafka, Kubernetes, Postgres, Flask, Docker, Logstash, Angular*

PROJECTS   **code and demos at github.com/zumaad**

Flipping-Utilities (*Java*)
- Core contributor and maintainer of open source project helping over 20k users with investing and arbitrage on a virtual commodity market
- Developed trade persistence capabilities, handling concurrent investing sessions across multiple trading accounts, and trading analysis
- Reduced persisted data size by ~ 50% through optimizations such as data pruning
- Helped developers by refactoring, adding documentation, creating a testing process, and writing unit tests
- Serviced users by communicating with them over github/discord, implementing their feature ideas, and fixing bugs they ran into

Sonar/Camera Streaming RC Robot (*Python | Javascript | React | Websockets | Hardware/Electronics | Raspberry Pi*)
- Created remotely controlled robot able to move, see, and sense objects via sonar and camera
- Developed server running on Raspberry Pi that allows user to control the robot by turning servos and sending camera and sonar data
- Implemented React frontend to send user input to the server, display sonar data as radar, display the camera feed, and store command history with playback options

Async HTTP Server (*Python | Sockets | Networking*)
- Built HTTP server with load balancing, reverse proxying, and static asset delivery
- Created event loop using generators and the select system call enabling request handlers to run concurrently
- Implemented and contrasted varying server architectures, including thread-per-client, thread-per-request and coroutine-per-client, by benchmarking requests/second and latency
- Made server properties highly customizable, allowing a user to define firewall rules, which load balancing strategy to pick, etc

Terminal Messenger (*Python | Sockets | Networking | AWS*)
- Developed real-time messaging service for terminal using socket level programming
- Implemented Slack-like UI using NCURSES with dedicated input and output boxes along with scrollable message history
- Leveraged DynamoDB to persist message history and user metadata, and EC2 to host central server

Skills

Languages:	Python, Java, Javascript, SQL, HTML/CSS
Frameworks:	Dropwizard, Django, React, Flask
Tools:	Docker, Kubernetes, Kafka, Logstash, Postgres, AWS RDS, AWS EC2, Git