Furkan Karabulut

Raleigh, NC: Open to Relocation	frkrbltn2332@gmail.com	https://github.com/frkrbltn	https://www.linkedin.com/in/furkan-karabulut01/	https://fkarabulut.com

EDUCATION

B.Sc. in Computer Science 08/2021 – 05/2024
North Carolina State University, Raleigh, NC
GPA: 3.2 / 4.0

SKILLS

Language: Java, C, Python, JavaScript, SQL, TypeScript, CSS, HTML
Tools: VS Code, Eclipse, Jupyter Notebook, JetBrains (IntelliJ, CLion, WebStorm)
Operating System: Microsoft, macOS, Linux

WORK EXPERIENCE

Software Engineer (Intern), Live Oak Bank: 06/2023 – 08/2023
Projects: Full-stack developer Raleigh, NC

- Worked as a full-stack developer, specializing in the development of RESTful APIs and enhancing front-end user interfaces and implemented responsive email templates for company-wide communications.
- Executed advanced front-end tasks by utilizing CSS and Bootstrap for layout designs and leveraged React.js to create dynamic and responsive components for an improved user-friendly application.
- Engineered Docker containers to establish a private network for microservices, optimizing development and deployment workflows.
- Explored Terraform and AWS, conducted comprehensive research on AWS services to gain a deeper understanding of cloud architecture and service integrations.

Software Engineer (Part-Time), PQSecure Technologies: 01/2023 – 06/2023
Projects: Memory Optimization for data structures Remote

- Conducted algorithmic level analysis and optimization for XMSS and LMS focusing on efficiency and security.
- Enhanced L-Tree and Merkle tree traversal algorithms, achieving significant memory and computational efficiency.
- Innovated XMSS's authentication node update algorithm, which led to a groundbreaking increase in performance, culminating in a 6% improvement in memory usage.
- Authored and contributed to the development of two patent applications:
    - A patent for a novel method that optimized memory utilization in cryptographic signature generation, improving overall system performance.
    - A patent for a unique implementation technique of cryptographic algorithms, which established PQSecure Technologies' proprietary methodology distinct from standard reference implementations.

Undergraduate Researcher, North Carolina State University: 06/2022 – 11/2022
Project: Algorithm Profiling & Efficiency Optimization Raleigh, NC

- Conducted a detailed analysis of existing codebase to identify and eliminate bottlenecks, significantly reducing complexity and profiling and optimization of Python library algorithms
- Implemented optimized algorithms by refactoring code, which involved unraveling nested loops and adopting more efficient data structures, resulting in a dramatic 96% improvement in runtime efficiency.

PERSONAL PROJECTS

Data Structure:

- Performing running time efficiency, analyzing properties of program, and asymptotic
- Implementing array, linked memory of lists, stacks, queues, graphs, and trees.
- Searching and using lists, unbalances tree structures (binary search trees, splay trees)
- Analyzing and implementing sorting (heap, merge, insertion, selection, quick , counting, radix sorting algorithms)

Coffee Maker Application:

- Engineered RESTful APIs using Java with Hibernate for seamless order and payment processing in the application.
- Deconstructed complex client requirements into actionable user stories, ensuring essential functionalities and system robustness.
- Design backend sequence diagrams to architect a scalable and resilient Coffee Maker application, facilitating future enhancements.
- Refined frontend user interface flow with AngularJS, HTML, CSS and JavaScript, enhancing the customer ordering experience for both managers and baristas.
- Structuring a robust MySQL database design, optimized for high-performance data handling and integrity.

PUBLICATIONS AND PATENTS

- Method for computing unbalanced L-Trees efficiently for hash-based signatured used in post-quantum
- A memory efficient method for the implementation of left node authentication in hash-based signatures data structure