Taylor Bushey

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Education

Bachelor of Science in Computer Science
University of Massachusetts Amherst, Amherst, MA | Graduation: August 2023

Coursework

Scalable Web Systems, Web Programming, Computer Networks, Operating Systems, Data Management, Data Structures, Java Programming, Applied Cryptography, Digital Forensics, Computer System Principles

Technical Skills

- Programming Languages: C, C++, Java, Python, JavaScript, HTML, CSS, SQL
- Web Technologies: Node.js, Svelte, React, Docker
- Tools: Git, GitHub, REST API, VirutalBox, Wireshark
- Operating Systems: Linux, Windows 10/11, macOS
- Databases: PostgreSQL, MySQL, MongoDB

Projects

1. **Seam Carving App (Python, NumPy, PIL)**
   - Developed a Content-Aware Resizing application using seam carving techniques in Python.
   - Real-time visualization through animated GIFs highlighting the intelligent seam carving process.
   - Introduced optimizations for efficient seam carving, ensuring smooth performance for high-resolution images.
2. **Chat Application (Node.js, MongoDB, Socket.IO, Render)**
   - Developed a real-time chat application using Node.js for the backend, HTML, CSS, and JavaScript for the frontend.
   - Implemented WebSocket communication using Socket.IO enabling private messaging and chat rooms
   - Incorporated MongoDB to store user account information and chat data.
   - Deployed the application on Render for optimized performance and scalability.
3. **Weather App (Svelte + Node.js)**
   - Developed a full-stack weather application with a frontend built using Svelte and a backend powered by Node.js.
   - Implemented API calls and asynchronous programming to efficiently fetch and integrate weather data.
4. **Social Media Application (Svelte + Node.js + MongoDB + Docker)**
   - Developed a full-stack social media application using Svelte for the frontend, Node.js for the backend, and MongoDB for the database.
   - Utilized Docker for containerization, ensuring seamless deployment and scalability.
   - Implemented features for user authentication, posts, and interactions within the platform.
5. **Unix-Like Filesystem (C/C++)**

- Implemented a robust Unix-like filesystem in C, implementing advanced serialization and de-serialization techniques for efficient binary structure read/write operations.
- Applied sophisticated data structures and algorithms to create a realistic file system.

6. **CPU Scheduling Simulator (C/C++)**
   - Simulated four CPU scheduling policies (FIFO, SJF, STCF, RR) to optimize process execution.
   - Utilized advanced data structures, including custom comparators and priority queues, to enhance algorithm efficiency.
7. **Memory Allocator (C)**
   - Efficiently managed memory allocation and deallocation.
   - Implemented key functions for heap management and memory metrics.
8. **Data Management (PostgreSQL)**
   - Made complex queries in large databases using PostgreSQL
   - Designed databases with ER models
   - Improved databases by utilizing selection, tuning, functional dependencies, and normalization
9. **Cryptopals Challenges (Python)**
   - Implemented the CBC padding oracle attack
   - Manipulated CBC-MAC by crafting JavaScript code, ensuring consistent hash values for distinct messages.
   - Executed a Man-in-the-Middle (MITM) key-fixing attack on Diffie-Hellman, incorporating parameter injection to compromise cryptographic security.
10. **Network Protocol Analysis Labs (Wireshark, Networking)**
    - Conducted comprehensive analysis of TCP, UDP, IP, SSL, and HTTP protocols
    - Investigated NAT behavior, decoding packet traces to understand translation processes at input and output sides.
    - Explored Wi-Fi protocols, decoding packets to understand packet structures and encryption mechanisms.

Work Experience

Sales Associate — Patriot Care
Greenfield, MA | 2019-2022
Delivered exceptional customer service and managed sales transactions in a dynamic retail environment.

Sales Associate — Friendly's Restaurant
Greenfield, MA | 2016-2019
Maintained a high level of customer satisfaction through effective communication and cooperation in a service-oriented setting.