Muhammad Usama Tayyab

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EDUCATION

Bachelor of Computer Science **2015 - 2019**
University of Central Punjab

TECHNICAL SKILLS

Programming Languages:	C++17/20, C, Python(Automation, Web Scrapping, Data Analysis), C#, Bash Scripting
Frameworks & Libraries:	Qt/QML, STL, Google Test, SFML, G-Test
Development Tools:	Git, GitHub, BitBucket, Surround SCM, JIRA, Helix
Specializations:	Socket Programming, Linux Message Queues, , Network Protocols (TCP/UDP, SDP), Data Structures & Algorithms, Design Patterns
Cloud :	AWS-S3
Other:	LaTeX, XML, JSON, SQLite

PROFESSIONAL EXPERIENCE

- **Senior Software Engineer (C++ developer)** **June 2021 - Present**
  Byonyks Pvt ltd.
  - Developed and maintained software for FDA-cleared Automated Peritoneal Dialysis (APD) machine using C++17, Qt framework, and embedded Linux.
  - Architectured inter-process communication system using Linux message queues for real-time data transfer between system components.
  - Collaborated with cross-functional teams (electrical, mechanical, QA engineers) to gather requirements and define new features for machine.
  - Conducted code reviews and mentored junior engineers in writing automated tests using Google Test framework, increasing code coverage to 95%.
  - Managed source control via GitHub and Surround SCM, tracked tasks using Helix & JIRA, and deployed periodic software releases through AWS.
  - Maintained comprehensive technical documentation for regulatory compliance and audits.
  - Reviewed large-scale therapy failure logs to identify root causes; developed C++, Python, and PowerShell scripts to automate log processing and analysis.
  - Resolved critical bugs in production, enhancing device reliability and increasing the success percentage of therapies from 60% to 91%.
- **Software Engineer (C++ developer)** **April 2020 - May 2021**
  Ebryx Ltd.
  - Developed cross-platform Network Security product using C, C++, Qt, and Python for macOS, Linux, and Windows.
  - Implemented socket programming and SDP protocol for TCP/UDP communication between controllers, gateways, and clients.
  - Integrated Single Packet Authentication (SPA) for secure data packet transmission.
- **Research Assistant at CSALT** **Sept 2019 - March 2020**
  Information Technology University
  - Contributed to Crime Investigation and Prevention Lab (CIPL) project focusing on audio analysis and keyword spotting.
  - Developed keyword spotting algorithms for audio utterance analysis.

– Applied machine learning techniques to audio signal processing for automated detection systems.

ACADEMIC/HOBBY PROJECTS

- **AI Based Snake Game:** An AI -based snake game using SFML which deploys three different algorithms for snake movement i.e. Breadth-first search (BFS), Depth-first search (DFS) and A* (heuristic based) to find the food.
- **Completed "The Modern C++ Challenge" (100 Problems):** Solved all 100 problems in the book "The Modern C++ Challenge". These 100 problems comprised of topics such as primality testing, Collatz conjecture, variadic templates, regex, time zones, multithreading, design patterns, file operations (XML, JSON, PDF), image manipulation, SQLite, cryptography, and networking.
- **LeetCode Problem Solving (203 Problems):** Due to my passion for problem solving, I solved 217 problems on LeetCode. Solved 101 easy, 104 medium, and 12 hard problems focusing on data structures and algorithms in C++17.
- **Search Engine of Wikipedia articles:** Implemented a search engine of provided wikipedia articles using C++11 and STL containers (std::unordered_map and std::map) for data indexing and retrieval. Afterwards a comparative analysis was performed to measure efficiency of hash-based and tree-based data structures.
- **File Compression/Decompression System:** Implemented Huffman algorithm for text file compression and decompression.
- **Disk Sort(External Sort):** Created program to sort files which are larger in size than RAM capacity using chunk-based sorting and k-way merge algorithm.

CERTIFICATIONS

- Data Analysis & Visualization with Python - Microsoft (Coursera)

  https://coursera.org/verify/PM6WXPQQR9RP
- Using Python to Access Web Data - University of Michigan (Coursera)

  https://coursera.org/verify/6RCFU7346HKM