Nour Al Mahdi Ballout

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Summary

Computer Science junior at Wayne State University with hands-on experience in object-oriented programming using Java, C++, and Python. Developed scalable applications such as a virtual CPU simulator and Minecraft server plugins. Seeking to contribute to real-world software development projects and gain exposure to CI/CD pipelines as a Software Engineering Intern.

Education

School: Wayne State University **Expected: Dec 2027**

Bachelor of Science in Computer Science – Minor in Electrical and Computer Engineering

- **GPA:** 4.0
- **Affiliations:** President and Founder of WSU's Video Game Design & Development Club

Skills and Completed Courses

Programming: C++, Python, Java, SQL, HTML, CSS, JavaScript, PHP, Lua, Object-Oriented Programming, Debugging
Technical & Tools: GitHub, AI Tools, Automation Testing, Android Studio, PostgreSQL, Cloud Platforms, Version Control, Documentation, Linux, Microsoft Office
Soft Skills: Communication, Curiosity, Willingness to Learn, Leadership, Teamwork, Arabic
Courses: Data Structures, Algorithm Design and Analysis, Database Management Systems, Mobile App Development

Projects

Sonus Charts – Python, Flask, Vite React, PostgreSQL **Completed: April 2026**

- Built a full-stack music analytics web app that visualizes top Spotify songs on a given date by country using a public dataset.
- Designed an efficient PostgreSQL database to store chart records, support user requests, and enable efficient querying of date and country specific song rankings.
- Developed Flask API endpoints to process chart data and serve structured responses to a Vite React frontend.
- Implemented user authentication with login and registration workflows using JWT-based authorization and CORS configuration.

Player Swap – Java, Spigot API **Completed: July 2025**

- Developed a configurable Minecraft server plugin that dynamically swaps player locations, inventories, and stats.
- Built an administrator command interface with subcommands for feature toggling, customization, and runtime control.
- Added validation and error handling for Minecraft server constraints to improve reliability and administrator usability.

Alpha CPU – C++ **Completed: June 2025**

- Designed and implemented a virtual CPU in C++ to simulate low-level instruction execution using arithmetic, comparison, and register-based operations.
- Built a virtual memory system using native C++ data structures to store and manage custom data objects during runtime.
- Created themed object wrappers for primitive datatypes using C++ operator overloading that utilizes the virtual CPU.
- Modeled core computer architecture concepts such as instruction processing, register management, and memory abstraction.

Fishing Rewards – Java, JUnit, Spigot API **In Progress Since 2024**

- Developed an open-source Minecraft server plugin that extends the default fishing reward system with configurable loot tables and customizable fishing related gameplay mechanics.
- Applied object-oriented design principles to integrate with Spigot's event-driven architecture to support modular rewards.
- Designed a highly documented YAML configuration system that enables server administrators to customize gameplay behavior without modifying the original source code.
- Implemented unit, integration, and performance testing with JUnit and Maven to improve reliability and maintainability.

Work Experience

Tinker Labs **Mar 2020 – Apr 2020**

Intern

- Researched and analyzed a large set of technical documents in a Linux environment, using Python scripts to automate data extraction and analyze key specifications that enabled the team to design AR and VR application prototypes.
- Assisted the development team in testing experimental AR features, debugging issues, and documenting findings, which helped improve feature stability.

Extra-Curricular Activities

Meaningful Power Foundation, Detroit, MI

- 4-day robotics and engineering bootcamp.