

# PAULINA SANCHEZ

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## EDUCATION

### UNIVERSITY OF NORTH TEXAS

Bachelor of Science in Computer Science

Relevant Coursework: Data Structures, Algorithms, Databases, Software Engineering, Artificial Intelligence

Denton, TX

Expected May 2026

## PROJECTS

### VIRTUAL SWITCH |

Mar 2025

- Engineered a **Layer 2 virtual switch** in **C** and **Python**, enabling **Ethernet frame exchange** across the internet and creating a **LAN-like environment** for remote devices.
- Developed a custom **VPN-like solution** with **TAP device integration**, replicating **Zerotier's functionality** to connect geographically distributed clients and enable seamless communication.

### RAYTRACING |

Jan 2025

- Developed a **ray tracing engine** in **C++** with **OpenGL**, implementing core rendering techniques such as **ray-sphere intersections**, **Lambertian reflection**, and **Schlick's approximation** for **realistic lighting**.
- Optimized **ray-object intersection** using **Bounding Volume Hierarchies (BVH)**, reducing **computation time** by **70%**, and streamlined **cross-platform builds** with **CMake**.

### SHELL |

Feb 2025

- Designed and implemented a **POSIX-compliant shell** in **C++** with a **Read-Eval-Print Loop (REPL) architecture**, enabling users to interact with the system through commands like **cd**, **pwd**, **echo** and enhancing responsiveness for continuous user interaction.

### WEATHER FORECAST APPLICATION |

Dec 2024

- Developed a high-performance, **cross-platform weather forecast application** using **C++** and the **Qt framework**, delivering an intuitive and responsive user interface.
- Integrated a **REST API** to fetch **real-time weather data**, leveraging **JSON** for efficient data processing and dynamic updates, ensuring a seamless and responsive user experience.

### PERSONAL WEBSITE |

Dec 2024

- Developed a responsive personal portfolio website using **HTML**, **CSS**, **JavaScript**, and **Bootstrap** with a mobile-first design approach, while configuring **AWS S3** for static hosting, **CloudFront** for content delivery, and **Route 53** for custom domain and SSL setup to ensure secure HTTPS access.

## WORK EXPERIENCE

### INDEPENDENT CONTRACTOR

Dec 2024

- Delivered **comprehensive product testing** services, including **bug identification**, **user feedback collection**, and **UI/UX evaluations** for **software and mobile app clients** via Upwork. Provided insights through detailed **testing reports**, helping clients improve product functionality and user experience before launch.

## SKILLS

**Programming Languages & Scripting:** C, C++, Python, JavaScript, SQL, Bash, HTML, CSS, JSON, REST API

**Development Tools & Platforms:** AWS, Git, GNU Debugger, LLVM, Linux

**Frameworks & Libraries:** Qt, Bootstrap

**Certifications & Training:** C++, Python 3, Generative AI, HTML/CSS (Codecademy)

**Languages:** English (fluent), Spanish (fluent)