Hayat Ahmad

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Technical Skills

Languages: C++, C, JavaScript, Python, HTML, CSS, Git, Zsh, VHDL **Frameworks**: React.js, Three.js, Node.js

Developer Tools: Solid Works, AutoCad, Altium Designer, KiCad, Blender, Linux, VsCode, STM32CubeIDE

Electrical skills: PCB Design, Soldering, Micro-controllers, Circuit Simulations, IoT Systems, 3D Printing

Experience

Electrical Team Member, University of Waterloo Orbital Design Team – Waterloo, Canada Sept 2024 – Current

- Completed a comprehensive course on **Altium Designer,** gaining proficiency in **PCB design** and schematic drawing.
- Engineered digital twin models of buck converters using **LTSpice's** SPICE-based circuit simulation engine, enabling accurate power conversion analysis for CubeSat power distribution systems

Software Engineer Intern | National University of Science and Technology – Islamabad, Pakistan June 2023 – Aug 2023

- Supported the development an intuitive web interface using **React** that connects students with professor research opportunities, resulting in streamlined research collaboration
- Developed responsive professor profile pages that display research interests, current projects, and contact information, leading to improved student-professor connections
- Improved research collaboration efficiency, resulting in a 20% increase in successful student-professor connections

Technical Team Intern | Tetra Pak Ltd. – Lahore Pakistan Aug 2023 - Nov 2023

- Supported engineers in the installation, troubleshooting, and maintenance of over 50 high-performance packaging machines
- Diagnosed and resolved mechanical and technical issues with less than 30 minutes per incident, resulting in a reduction in overall downtime and improved production efficiency.
- Collaborated with cross-functional teams to optimize machinery efficiency and reduce operational bottlenecks.

Projects

Desktop Spotify Assistant - ESP32 | C++ | OAuth2.0| ArduinoJSON | Python

- Engineered an **IoT** device using **ESP32** microcontroller and TFT display, enabling real-time visualization of Spotify track information and album artwork
- Implemented Spotify **Web API** integration, resulting in dynamic fetching of track metadata and enabling seamless content updates without user intervention
- Developed **HTTP request** handlers for rotary encoder inputs, allowing direct music control (play/pause, volume) without accessing the Spotify app
- Architected secure authentication system using **OAuth 2.0**, ensuring persistent access through automated token refresh and secure API communication

Custom Macropad - Raspberry Pi Pico | CircuitPython | Altium Designer | AutoCAD

- Designed a custom 3X3 matrix **PCB** for a macropad, optimizing layout for efficient keypress registration and durability.
- Developed a **CircuitPython** script to enable customizable macros for specific keys, enhancing user productivity and workflow.
- Integrated dual-function rotary encoders with **HID protocol**, resulting in seamless system control (volume/brightness)

Portfolio Website - HTML | CSS | React.js | Javascript | Three.js | JSON

- Designed and developed a portfolio website utilizing **React.js** implementing modular component architecture and **CSS modules** for maintainable, scalable code.
- Engineered reusable React components that dynamically render professional experience and skills from external **JSON** data sources, reducing code redundancy and maintenance overhead
- Leveraged Google's **Model Viewer Web Component** to render glTF/GLB 3D models, resulting in cross-browser compatibility without requiring WebGL boilerplate code or custom shader implementations
- Developed custom image asset management utilities to optimize resource loading and maintain consistent URL handling across components

Education

University of Waterloo, BASc in Computer Engineering - *Candidate* Sept 2024 – current

- **Presidents Scholarship**