Saadan Surhyo

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EDUCATION

University of Wisconsin-Madison   Madison, WI
Double Major - B.S Computer Engineering and Computer Sciences   Expected Graduation: May 2025
- Relevant Coursework: OOP, Data Structures & Algorithms, Operating Systems, DBMS, AI/ML, Agile Methodology, Machine Organization, Computer Architecture, Digital System Design, VLSI Design, Microprocessor Systems

WORK EXPERIENCE

Software Engineer | *SwiftUI, visionOS, Agile*   Sep 2024 - Dec 2024
Holos, Inc.   Madison, WI
- Collaborated with a team of 4 engineers to develop an immersive office hours application for Apple Vision Pro, enabling real-time collaboration between students and instructors through spatial computing
- Architected modular 3D interaction system leveraging RealityKit for gesture-based manipulation (drag, scale, rotate) and model state synchronization across multiple users via SharePlay
- Engineered integration of multi-user collaboration capabilities using GroupActivities framework, achieving seamless synchronization for whiteboard drawings and 3D model interactions across devices
- Designed modular system architecture separating feature components (3D Models, PDFViewer, Whiteboard, Spatial drawing) into independent modules, enabling efficient feature development and maintenance
- Implemented immersive space management system with visionOS APIs, handling transitions between 2D windows and 3D environments while maintaining consistent user experience across collaboration sessions

PROJECTS

Digital Logic Analyser – *UW Madison (ECE551 Project) | SystemVerilog, ModelSim, Synopsys*
- Designed 5-channel logic analyser with 400 MS/s sampling rate, featuring adjustable threshold levels and protocol-based triggering (SPI/UART)
- Implemented RTL in Verilog with datapath/control partitioning, verified using self-checking testbenches
- Synthesized the design for 1 GHz timing and demonstrated functionality on the DE0-Nano FPGA board

Digital Neuron Design – *UW Madison (ECE555 Project)*
- Designed a neural network perceptron module for machine learning acceleration using Cadence VLSI tools, optimizing for area and timing efficiency
- Developed MAC unit components with gate-to-layout design flow in ASAP7nm PDK, verifying via DRC/LVS
- Optimized critical paths across RVT/LVT process corners through parasitic extraction and metal (layer) routing
- Implemented 2-input neuron with configurable weights and ReLU activation for binary classification, characterized with FO4 loading through pre/post-layout simulation

Embedded Multiplayer Dino game - *UW Madison (ECE353 Project)*
- Engineered a dynamic multiplayer Chrome Dino game on PSoC6 MCU using FreeRTOS, implementing real-time task management and UART-based player/game state synchronization
- Developed custom drivers to interface with various PSoC6 peripherals including joystick control, IMU-based obstacle dynamics, and light-sensitive display adjustments

Operating Systems - *UW Madison (CS537 Projects) | C, xv6, Linux*
- Implemented core OS features (syscalls, memory management, scheduling, synchronization primitives) in xv6
- Developed a custom shell supporting pipes, environment vars, and built-in commands using the fork-exec model
- Built an optimized concurrent key-value store server using a thread-safe ring buffer and fine-grained locking
- Created a FUSE-based file system with support for core (CRUD) file and directory operations

Reddit posts Search Application - *UW Madison (CS400 Project)*
- Co-led a backend team of 8 in the development of an app, that implemented a hash table-based search algorithm to efficiently index and retrieve 1000's of Reddit posts based on specific keywords
- Conducted comprehensive unit testing on 2 team members' code using JUnit to validate the performance of the search app, resulting in a highly reliable and error-free application

SKILLS

Programming Languages: Java, C/C++, Python, Swift, SwiftUI, JavaScript, HTML, CSS, SQL, MATLAB, Bash
Software/libraries/tools: Git, Linear, SQLite, Jupyter, Pandas, PyTorch, NumPy, SystemVerilog/Verilog, Altium, Cadence