Alan Mendoza

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Education

California State University, Sacramento – B.S. Computer Engineering   Dec 2024

Projects

NVIDIA Jetson Traffic Management System, **Caltrans** – Sacramento, CA   Jan 2024 – Dec 2024
- Developed and integrated NVIDIA Jetson machine vision technology into existing traffic management systems to enhance real-time traffic monitoring from a single camera into multiple outputs.
- Designed system architecture that interfaced with existing infrastructure, providing seamless interaction with hardware components.
- Resolved issues related to machine vision algorithms, contributing to system reliability.
- Led a team in utilizing project management tools like Linear to assign roles and tasks, ensuring efficiency and clear communication with product management.

CMOS Layout, Design, & Analysis   2023
- Created and optimized transistor-level schematics for CMOS logic gates using Cadence Virtuoso for a 45nm CMOS process, providing efficient and compact layouts.
- Ensured design accuracy by maintaining W/L MOSFET values, achieving zero design rule check (DRC) errors, passing layout versus schematic (LVS) checks, and minimizing layout area.
- Executed layout troubleshooting by following specific layout environment specifications, resolving LVS mismatches and library misalignment issues, guaranteeing seamless compliance with design constraints.
- Verified circuit functionality through simulation waveforms, conducting test benches to confirm correct input-output logic behavior.
- Documented findings extensively, producing detailed multi-page lab reports that analyzed design choices, simulation results, and troubleshooting insights.

STM32 Locking Mechanism Development   2023
- Led the design and development of a locking mechanism using an ARM-based STM32 microcontroller, integrating multiple I/O components like keypads, RFID, and fingerprint scanners.
- Programmed the microcontroller to display status updates on an OLED and Matrix display to output validation results from the locking mechanism.
- Managed project logistics, set up group meetings, and tracked progress using BitBucket for version control, improving remote collaboration skills.
- Developed hardware-software interactions, optimizing communication between the microcontroller and external components.

Processor Logic Circuit Design & Implementation   2023
- Designed and simulated complex processor logic circuits, including instruction fetch decoding, memory walkers, and register files.
- Implemented data memory and logic circuits that formed efficient data storage and retrieval.
- Applied debugging techniques to ensure functional processor operation.

Skills

Programming Languages: C/C++, x86 Assembly, Python, Java, JavaScript, MATLAB

Hardware Description & Simulation Tools: Multisim, Logisim, SPICE, Verilog, VHDL

Lab Equipment: Oscilloscope, Logic Analyzer, Power & Function Generators, Multimeter

Software & Misc Tools: Linux, Cadence Virtuoso, KiCad, Git, Virtual Machines, Unix Bash Shell

Synthesis Tools: AMD Xilinx Vivado

Club Involvement: MESA and SHPE-Society of Hispanic Professional Engineers