Jashwanth Bamidi

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Education

University of Illinois Urbana-Champaign Champaign, IL
Bachelor of Science in Electrical Engineering *Expected Graduation: May 2027*
GPA: 3.84/4.00
Relevant Coursework: Digital Logic Design, Computer Systems, Electronic Circuits, Analog Signal Processing, Design Laboratory

Experience

Eco Illini Aug. 2025 – Present
Battery Management System *Champaign, IL*
- Led the **Power Distribution Unit** and **Joule Meter** PCB-Design teams in developing power regulation and monitoring systems using **KiCad**, reducing prototype iteration cycles by 30%.
- Designed and simulated DC-DC buck converters and LDO voltage regulators to supply stable 12 V and 3.3 V rails for sensors and control units with less than **50 mV** ripple.
- Developed and validated current and voltage sensing circuits using INA228 and STM32 microcontrollers; achieved less than **1%** measurement error verified through **LTSpice** simulations and **oscilloscope** testing.
- Collaborated with powertrain and telemetry teams to integrate **CAN** and used **SPI** and **I2C** communication protocols between components, improving data reliability.

Illini EV Concept Aug. 2024 – Present
Motor Encoder Team *Champaign, IL*
- Spearheaded the design and simulation of encoder PCB using **KiCad** and **LTSpice**, achieving a **15%** improvement in motor speed feedback accuracy.
- Conducted full bring-up and validation with **oscilloscopes**, **logic analyzers**, and differential probes; resolved 5+ hardware bugs and reduced testing time by **40%**.
- Coordinated with drivetrain, power, and controls teams to integrate **PCB design** into the EV system, ensuring stable motor communication during bench testing.

GateWay Tax Services May 2023 – Aug 2023
Data Analyst Intern *Inglewood, CA*
- Processed and reorganized **10,000+** client tax records with **Excel** macros, reducing redundancy by **20%** and improving report generation speed.
- Built semi-automated workflows for client communications and data reporting, shortening turnaround time from 3 days to 1 day.
- Collaborated with management to plan digital infrastructure upgrades projected to reduce manual data entry by **50%**.

Projects

Pipelined RISC-V CPU Core | *SystemVerilog, RTL Design, Vivado, FPGA Simulation*
- Built a fully functional **5-stage pipelined RV32I CPU core** (IF–ID–EX–MEM–WB) achieving a **3.8× throughput improvement** over the single-cycle design.
- Implemented **data forwarding, hazard detection, and branch/JAL/JALR flush** units to resolve all data/control hazards and sustain **1 CPI** steady-state.
- Integrated **modular pipeline registers** with stage-accurate control propagation, ensuring correct writeback sequencing and complete RV32I ISA support.
- Verified pipeline timing, forwarding paths, stalls, and branch resolution using **Vivado XSim** and EPWave with **100+ directed and random test programs**.
- Performed **FPGA synthesis and timing analysis** in Vivado targeting the RealDigital Blackboard, validating pipeline timing, LUT/FF utilization, and memory inference for on-board execution.

Hardware Guitar Auto-Tuner | *Analog Circuit Design, Oscilloscope, Waveform Generator, CAD*
- Developed a fully **analog auto-tuning system** for guitar strings using op-amp gyrator circuits, high-Q band-pass filters, and peak detection.
- Designed frequency-selective **RLC filters** at 630 Hz, 660 Hz, and 690 Hz, achieving tuning accuracy within **2 Hz** and noise attenuation exceeding 40 dB.
- Implemented **comparator circuits** with peak detectors and an **H-bridge** motor driver to automatically adjust tuning pegs with mechanical rotation precision within **3 degrees**.

Technical Skills

Languages: Python, C++, C, Verilog, SystemVerilog, RISC-V, MATLAB, Assembly
Hardware Tools: Oscilloscope, Waveform Generator, Multimeter, FPGA, LTSpice, KiCad, Altium Designer, PCB Bring-Up, Soldering, Logic Analyzer, STM32CubeIDE, Fusion 360
Software & Simulation: Vivado, EDA Playground, ModelSim, EPWave, Quartus Prime, LTSpice, Git, Linux CLI