

ECE 497: Special Project

Weekly Report

Week 01

Alexander Lukens Karl Hallsby

Illinois Institute of Technology

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- ▶ This is the intended behavior.
- ▶ A platform for designing, simulating, and implementing RISC-V hardware systems using open-source libraries
- ▶ Supports three main RISC-V core designs: Rocket Core, BOOM (Berkeley Out-of-Order Machine), and CVA6 Core
- ▶ It seems that the Rocket Core is the most uniformly supported (sifive-blocks library provides several system components intended to be used with the Rocket Core)
- ▶ It is important to note that FPGA prototyping is supported, and the specific FPGA board I already own is explicitly supported ([Xilinx Arty 35T](#))

Simulation

- ▶ Supports several simulation platforms, one of which is Verilator. Verilator is an Open-Source platform for simulating RTL logic, maintained by [Veripool](#)
- ▶ For advanced simulation, FireSim can be used to simulate fast FPGA boards to ensure pre-silicon verification and performance testing. FireSim is intended to be used on AWS cloud instances, so funding would be required if we intend to use this simulator. Provides comprehensive I/O simulation, including timing-accurate DRAM, Ethernet, etc. simulations. I anticipate that the Xilinx Vivado suite should provide sufficient FPGA simulation for our needs.

- ▶ Provides instructions for complete simulation using Verilator, including waveform generation. ECE Department Saturn Server provides tools that can be used to analyze waveforms (CosmoScope)



Our Focus

- ▶ Develop a working RISC-V chip prototype.
- ▶ Something else too.