EE/CPRE/SE 491 - sddec24-13

ReRAM Compute ASIC Fabrication

Weekly Report 8

3/26/24 - 4/2/24

Client: Prof. Henry Duwe

Advisor: Prof. Cheng Wang

Team Members:

- Gage Moorman - Team Organizer, main analog designer
- Konnor Kivimagi - Main documentation editor, mixed analog digital designer
- Nathan Cook – Main client liaison, mixed analog digital designer
- Jason Xie – Assistant documentation editor, main digital designer

Weekly summary:

This week, we made some progress on the ReRAM models that weren't simulating properly by improving some software that is thought to be the issue, this has yet to be tested. We have also began designing the ADC schematic

Past Week Accomplishments:

- Made progress on ReRAM model issue
- Produced a plan for how to control all the circuits together
- Worked on Logic Analyzer concept and how it will work

Individual Contributions:

Team Member	Contributions	Weekly hours	Total Hours
Konnor Kivimagi	Made progress on ReRAM model issue, spent time organizing and documenting	10	56
Gage Moorman	Began Creating ADC Schematic	6	54
Nathan Cook	Started working on ReRAM schematic and controller design	6	52
Jason Xie	Assisted in developing control logic for ReRAM. Assisted in documentation.	6	52

Pending Issues:

- ReRAM instances within xschem are not simulating properly
  - Potential fix found, needs to be tested
- Figuring out controller design
- No straightforward way to analyze xschem/ngspice data on outside applications
- Need to update website
- Do not know how to synthesize Verilog in xschem for ADC

Plans for the coming week:

- Gage Moorman
  - Finalize Sizing of Comparator Transistors
  - Create resistor ladder for ADC and Encoder Verilog
  - Simulate and test full ADC design
  - Build upon analog documentation
- Konnor Kivimagi
  - Fix ReRAM model issue
  - Organize documentation
  - Walk through ReRAM operations
- Nathan Cook
  - Keep working on logic analyzer and what will be needed for control signals
- Jason Xie
  - Assist on improving documentation formatting and quality
  - Mapped out required peripherals for ReRAM control

Summary of Advisor Meeting:

This week we discussed the operations of ReRAM and walked through the form, set, reset, and read operations to make sure that everyone was on the same page about the direction that we are heading. We also discussed the upcoming presentation and how we should prepare for that to ensure we have everything we will need.