

# **GNU Radio Zedboard Implementation with FPGA Acceleration**

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# Outline

- Overview
- Accomplishments
- Milestones
- Two week sprint
- Quarter Plan
- Conclusion

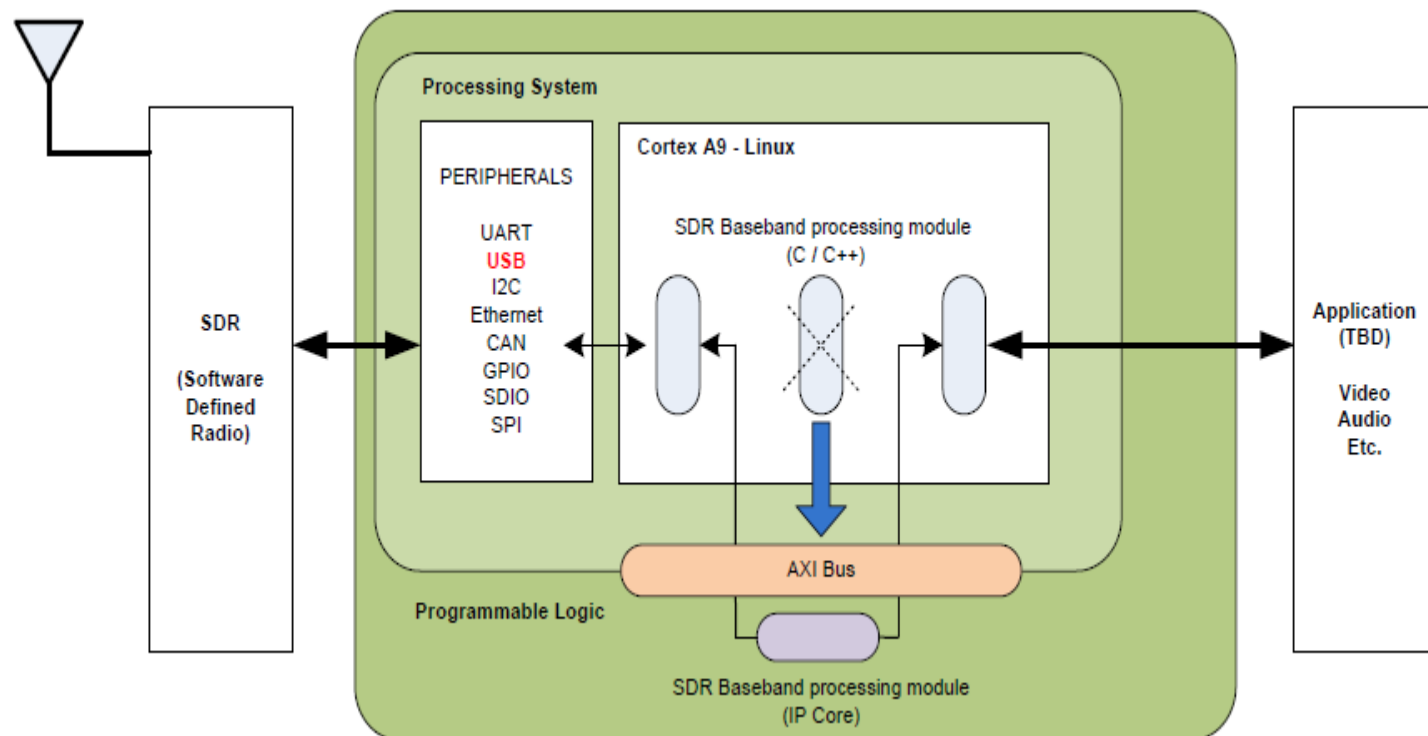
# Overview

Implement GNU Radio on the Zedboard

Route Part of the Rx Chain through the FPGA

Measure performance before and after

# Overview (cont.)

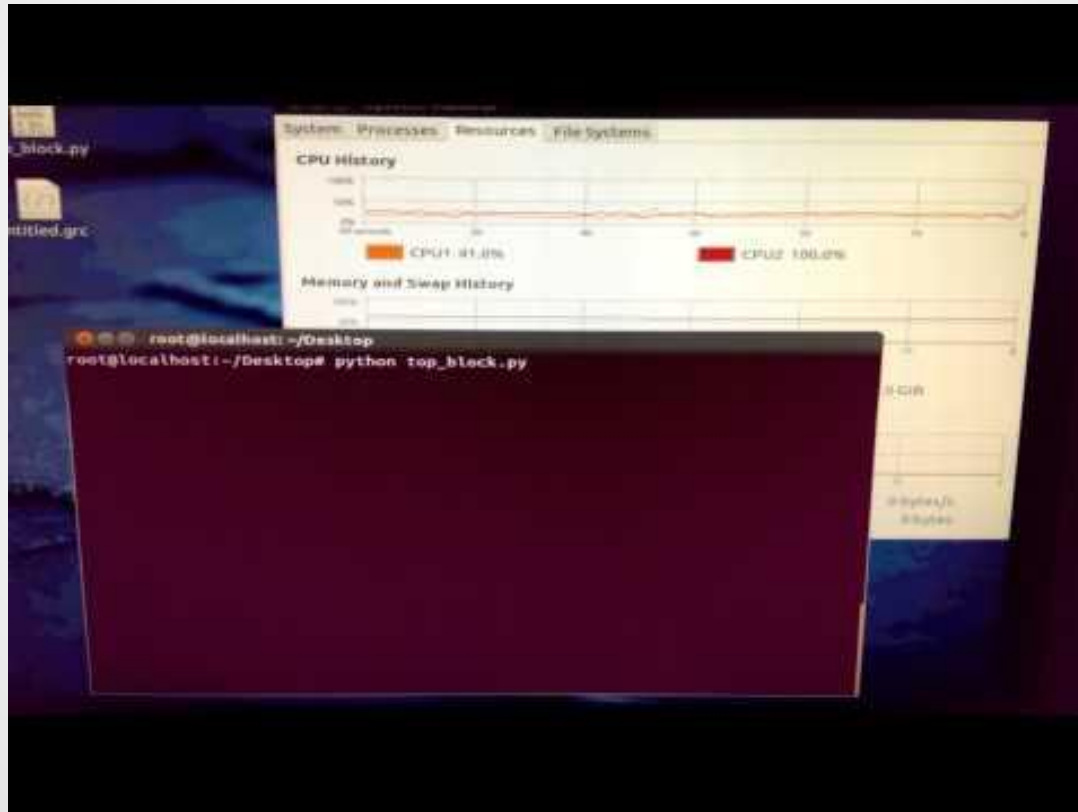


# Accomplishments

- GNU Radio (GR)  
Running on Laptop  
Capturing FM (Ali)
- GR Development  
Environment (Nishant)
- GR Installed on  
ZedBoard (Jun, Ali,  
Keyur)



# Accomplishments



# Issues

- Zedboard limitations
  - Memory
  - Slow speed (package installation time)
- Took too long to decide on Linux image



# Future Milestones

- Choose 1-3 blocks to implement in FPGA (teams of Ali and Keyur, Jun and Nishant)
- Create test benches using captured data (Keyur, Nishant)
- Prove blocks will fit on FPGA via simulation
- Integrate Verilog code with GNU Radio and demo
  - with previously recorded samples
  - in real-time (stretch goal)
- Try implementing with Petalinux instead of Xillinux

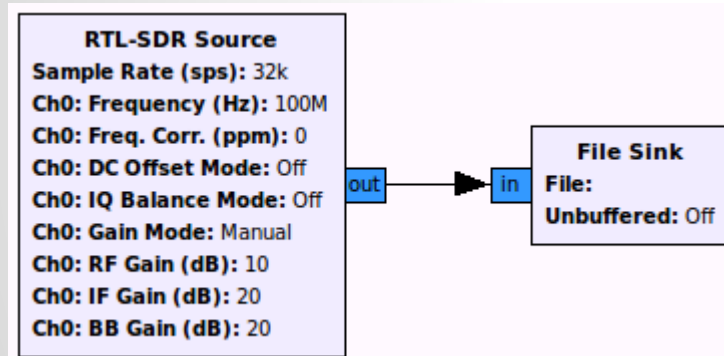


# Upcoming Two Week Sprint

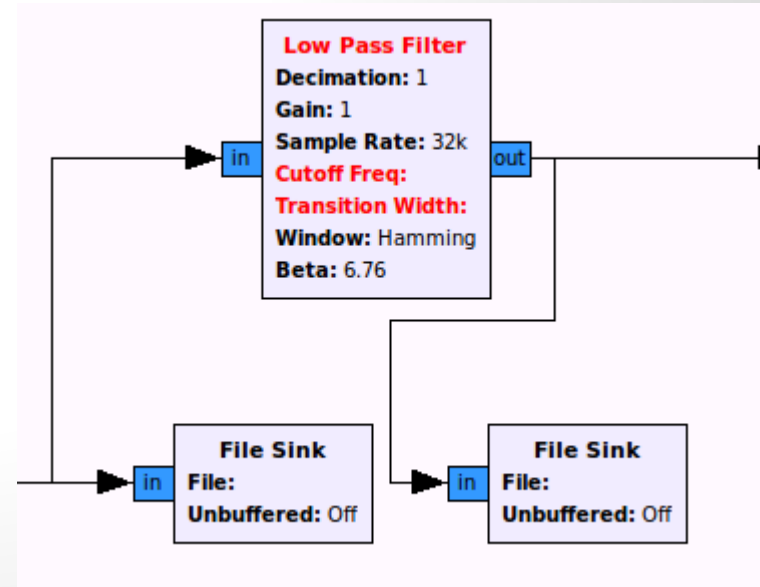
- Code analysis to choose functions to recreate in hardware (Nishant, Ali)
- Capturing testbench data (Keyur, Jun)
- Creating testbenches (Keyur, Jun)
- Have at least one block successfully simulate in HLS (team competition!)

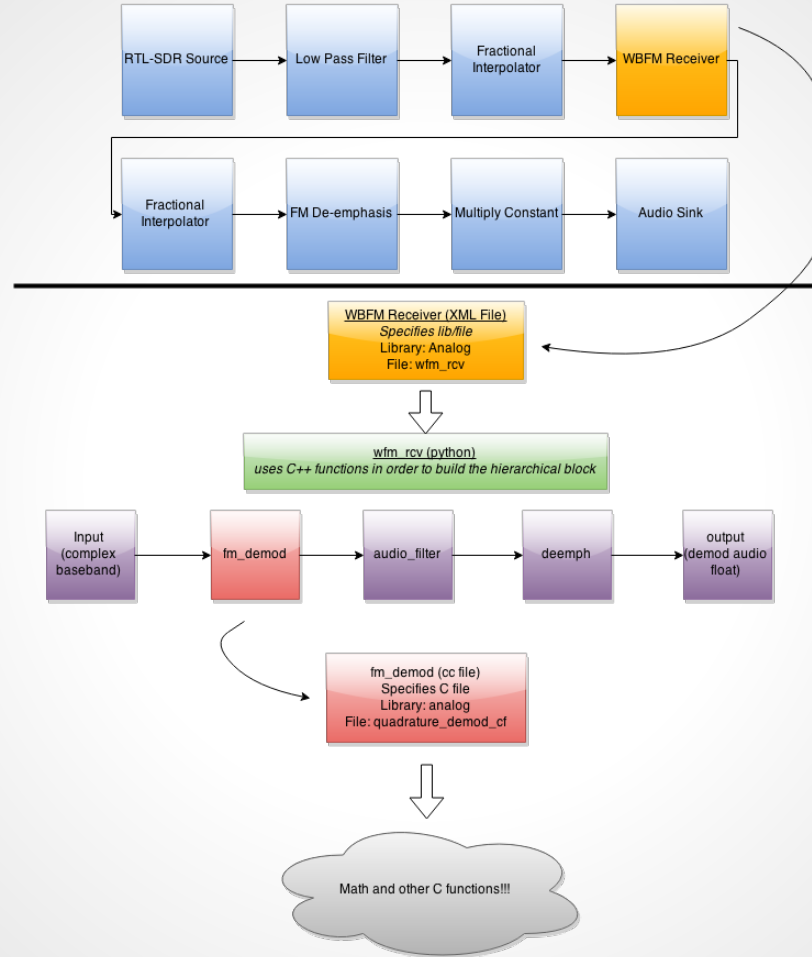
# Upcoming Two Week Sprint

## Sample Data Collection



## Testbench Data



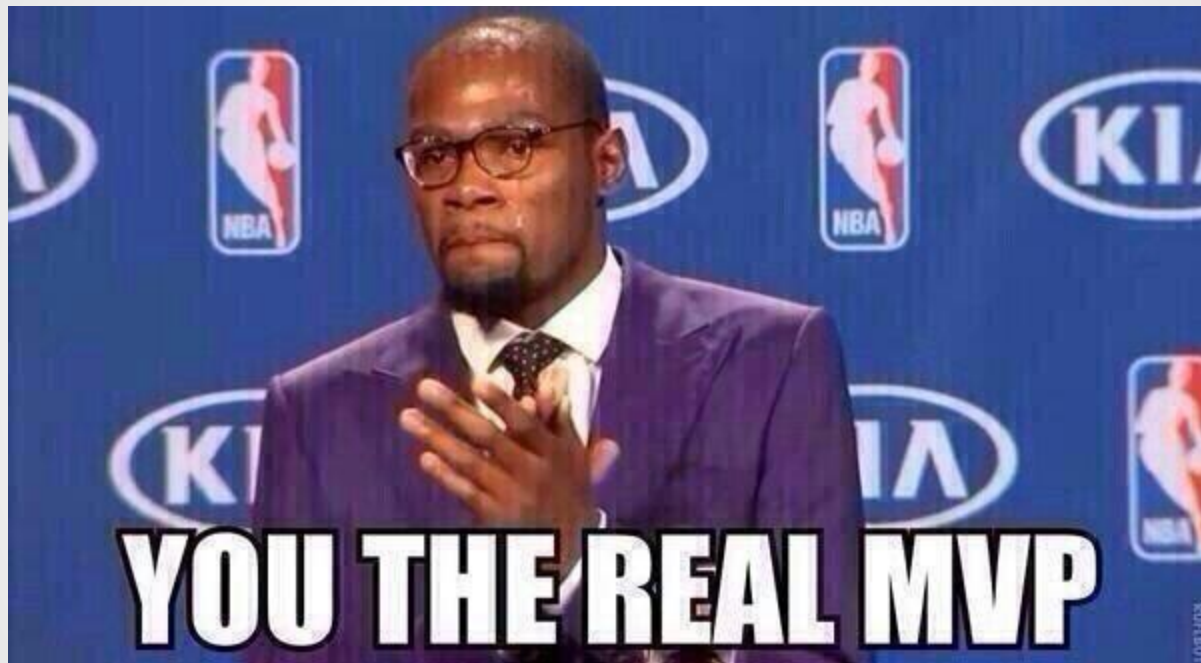


# Quarter Plan

Two demonstration goals at the end of this project

- show that data is processed to nearly the same fidelity on the Zedboard as on a laptop
- show the system is working in real time with FM radio

**Jun is this week's MVP**



# Conclusion

- Finally have GR Installed on Zedboard
- Need to determine scope of Rx chain that can be implemented in FPGA
- Still deciding on real-time vs processing recorded data