



FPGA iPad

Alex Leffell and Sienna Ramos

Overview

We want to manipulate the size, rotation, and placement of an image on a VGA screen with our fingers.



High Level Block Diagram

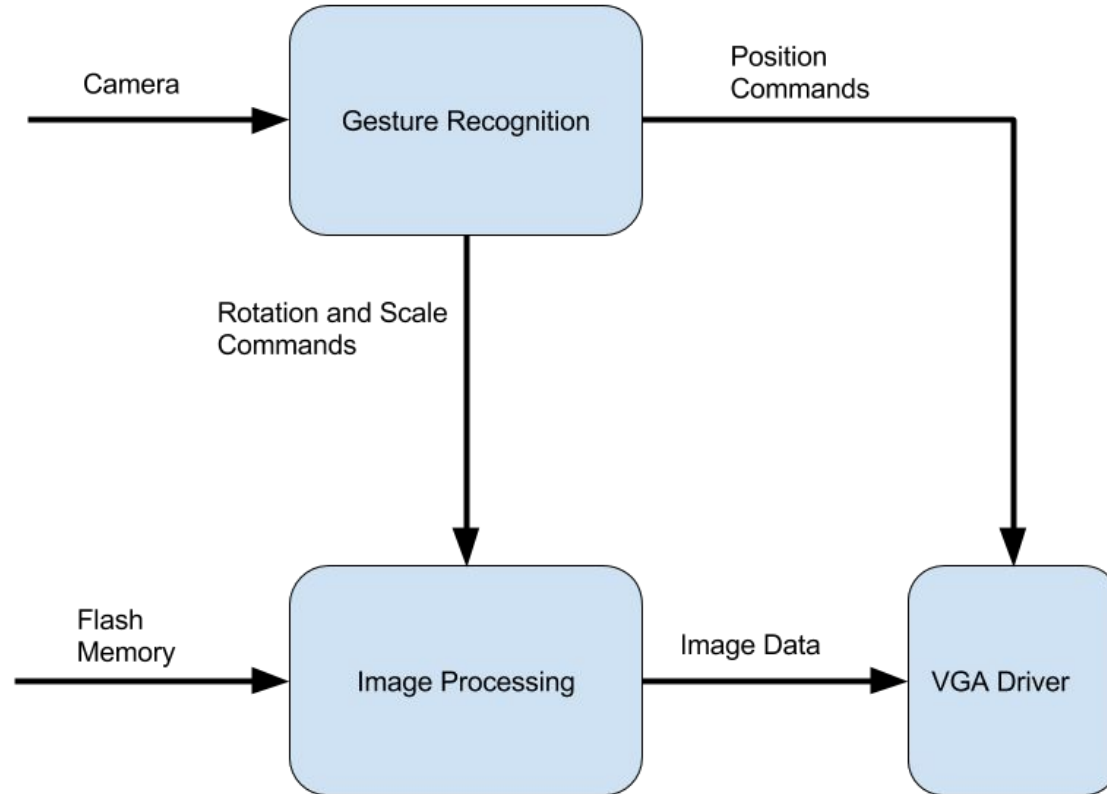


Image Processing Module

- Limit to 50%-200% scaling
- 8 scaling steps

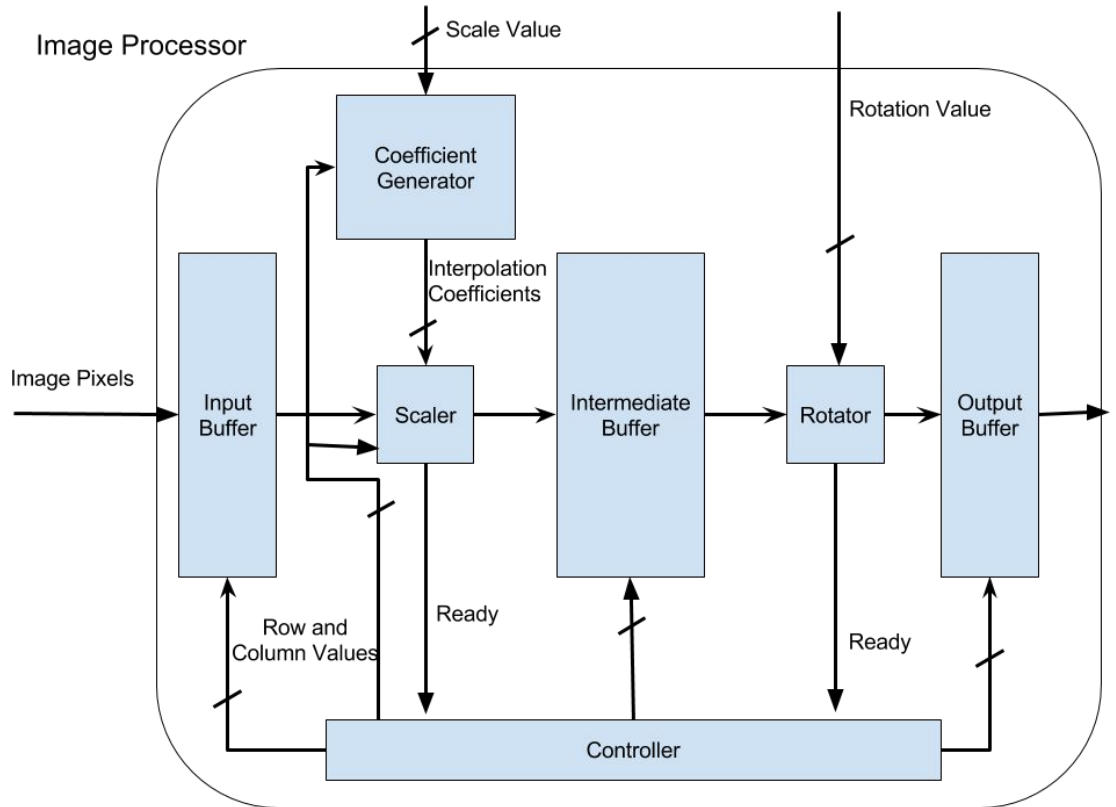


Image Processing Module

- Limit to 50%-200% scaling
- 16 scaling steps

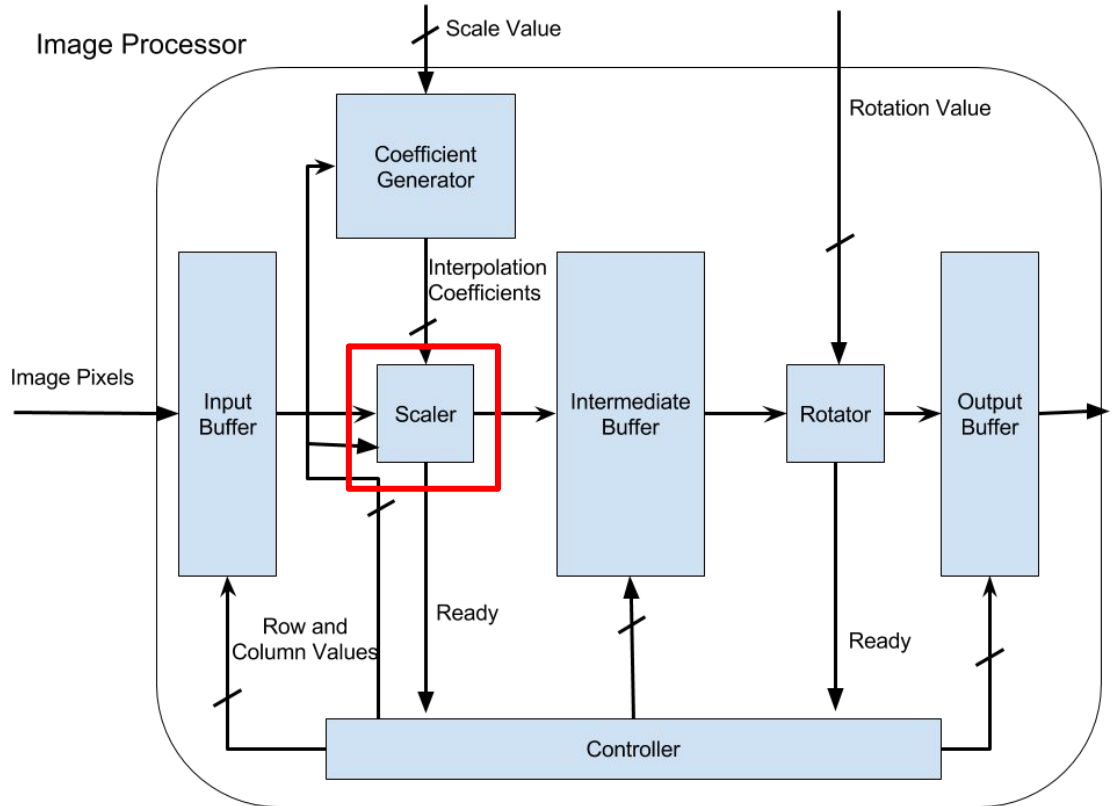


Image Processing Module

- First Iteration: Simple FIR structure
 - Like Lab 5 but with more complicated memory management

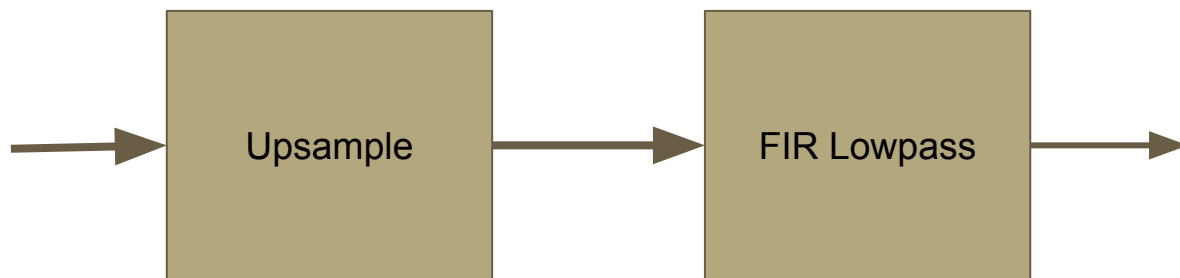
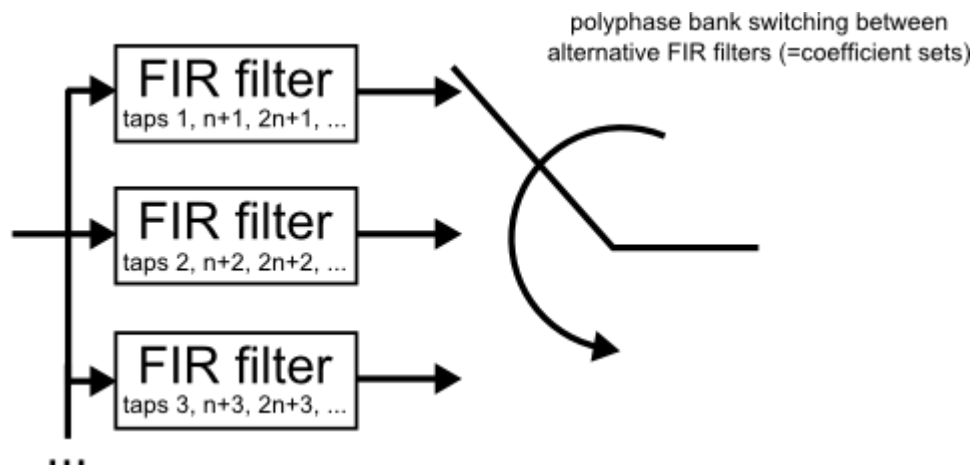
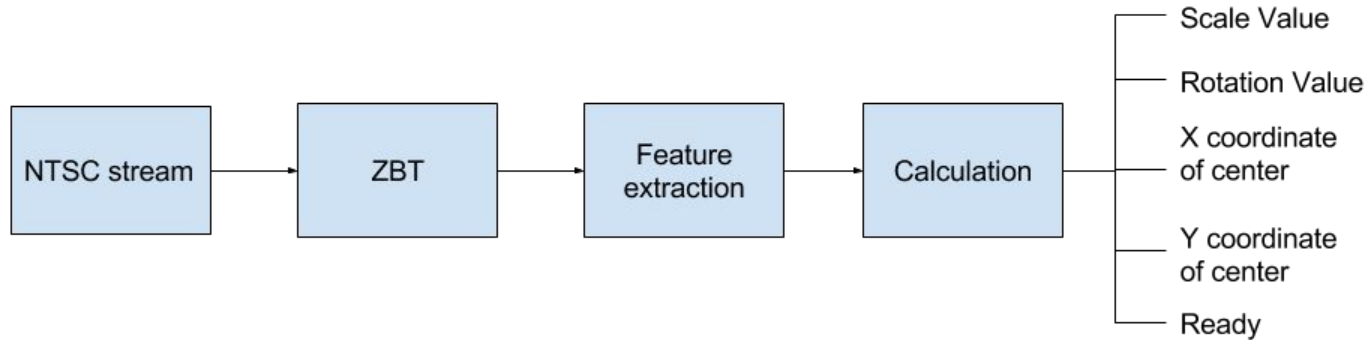


Image Processing Module

- First Iteration: Simple FIR structure
 - Like Lab 5 but with more complicated memory management
- Then: Polyphase structure for increased efficiency



Gesture Recognition Module



Three main tasks:

- Save the locations of any bright spots (fingers) in the image into the ZBT
- Find the center of the bright spots
- Use center coordinates to calculate scaling, rotation, and transposition values.

Challenges

- Both Image Processing and Gesture Recognition are memory intensive, and we will need to be clever about using the labkit memory so that we will not run out of space.
- Reducing noise in the camera so that Feature Detection works correctly.
- Completing computation fast enough to operate in near real time.

Timeline

Week	Sienna	Alex
November 6	Acquire parts	Experiment with Image Processing module architectures
November 13	Complete NTSC to ZBT module Complete Feature Detection module	Complete Coefficient Generator and Buffers Complete Scaler and Controller
November 20	Complete Command Generator module	Complete integration and testing of all image processing modules
November 27	Integrate Gesture Recognition and Image Processing modules	
December 4	Buffer Week Work on stretch goals	
December 11	Demo project and submit final project report	

Questions?