Wireless Camera

Wireless Camera using Android/Firebase and FPGA Camera

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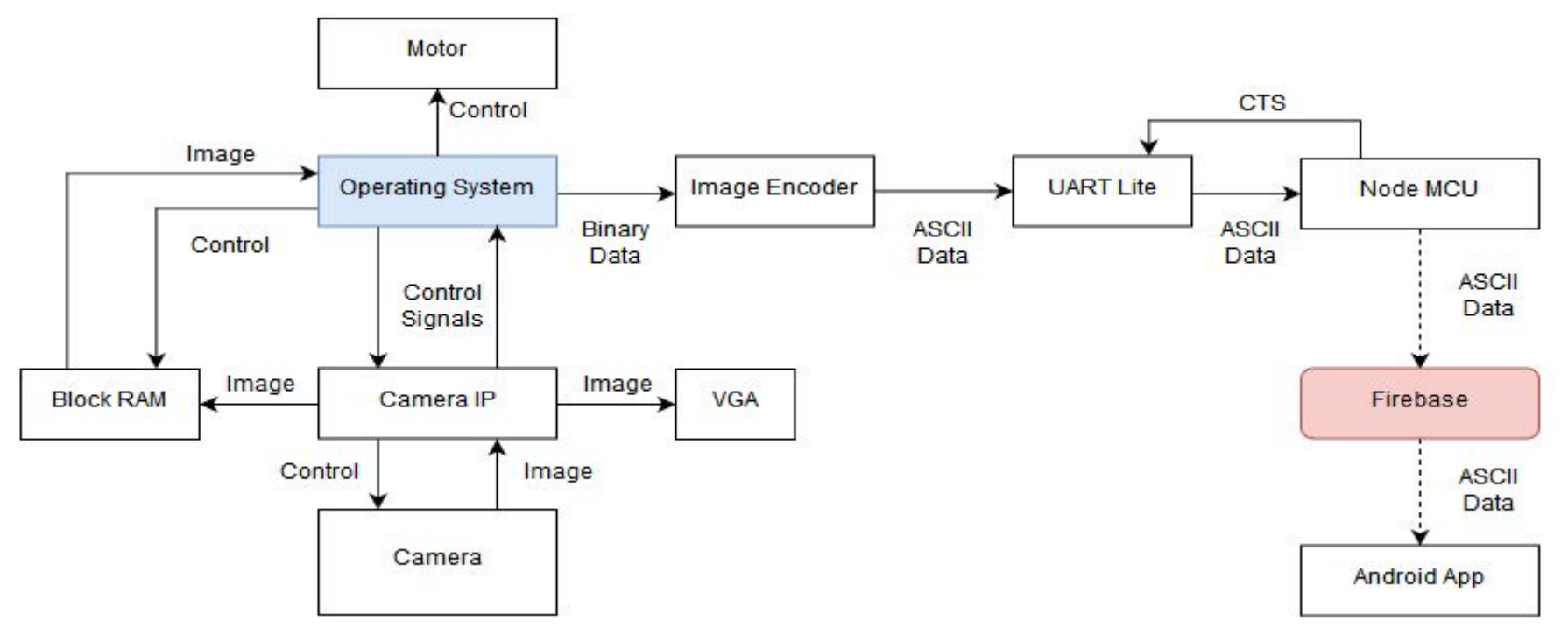
Team Roles

- Andrew Capatina
  - Android App
- Ryan Bentz
  - Image Processing
  - Wifi Connectivity
- Ryan Bornhorst
  - Configure Camera Display
  - Image Processing

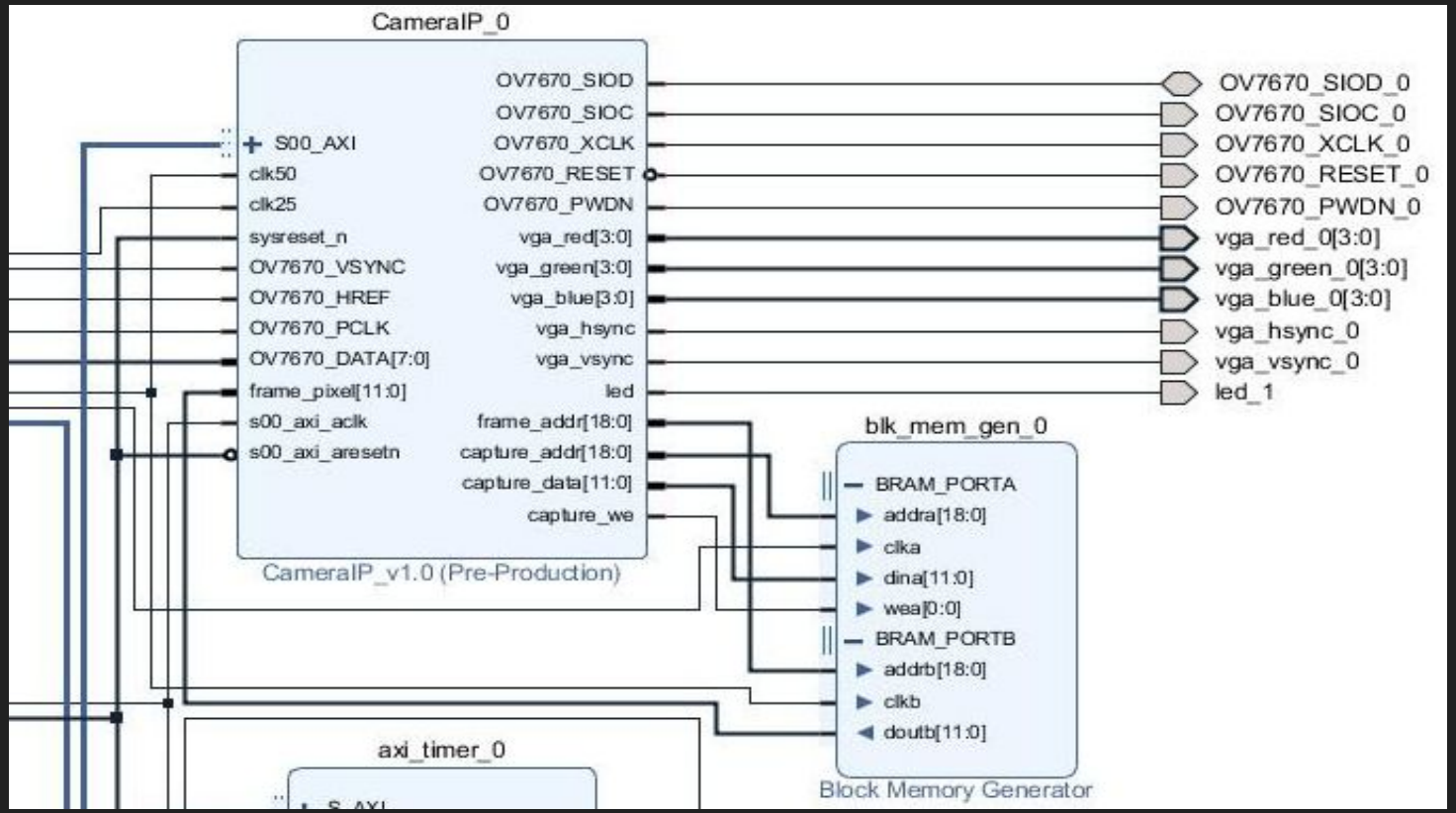
System Design



OV7670 Camera Module

- Controlled through Serial Camera Control Bus (SCCB)
- Supports multiple formats - we are using RGB565
- Max image transfer rate - 30 fps / VGA

Camera Module as IP



Camera Status Report

Completed:

- Camera setup as IP that can be read/written to from software
- Currently streaming the picture through the VGA port
- Using I2C bus to write to camera for configuring display output

To Do:

- Use software to read entire camera image off the AXI bus from RAM
- Serial data transfer of image to the NodeMCU

Image Transfer and Wifi Connectivity

- Images encoded using base64 encoding
- Image data transmitted to NodeMCU via UART
- NodeMCU collects image data and writes to Firebase as JSON object
- Image decoded and displayed on Android app

Completed:

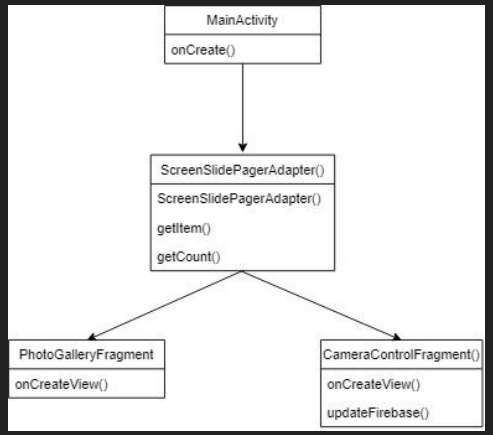
- NodeMCU connectivity to Firebase
- Data transfer between FPGA and NodeMCU

To Do:

- Camera Image to base64 encoding
- Android image decoding

Android App

- What has been completed:
  - User interface for camera interaction.
    - Firebase is updated once user makes selections.
  - Displaying lists of images.
    - A fragment receives an image ID each time it’s instantiated.
- What is remaining:
  - Splash screen with Async task.
  - Ability to delete photos.
  - Listeners for adding new images to layout.
- Problems encountered:
  - Implementing RecyclerView for displaying a gallery of photos.
  - Performance issues when using Firebase.



THANK YOU