Material Sorter

Project Update

Presenters:

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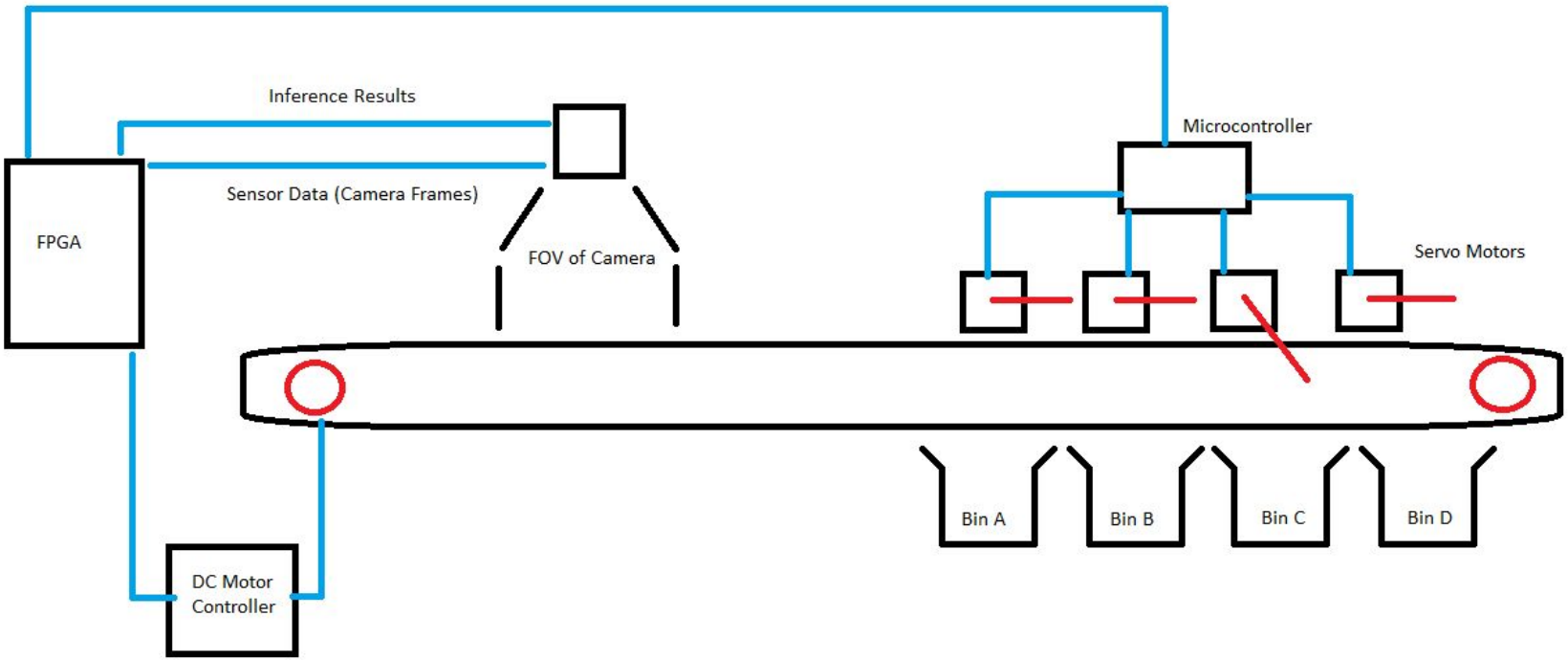
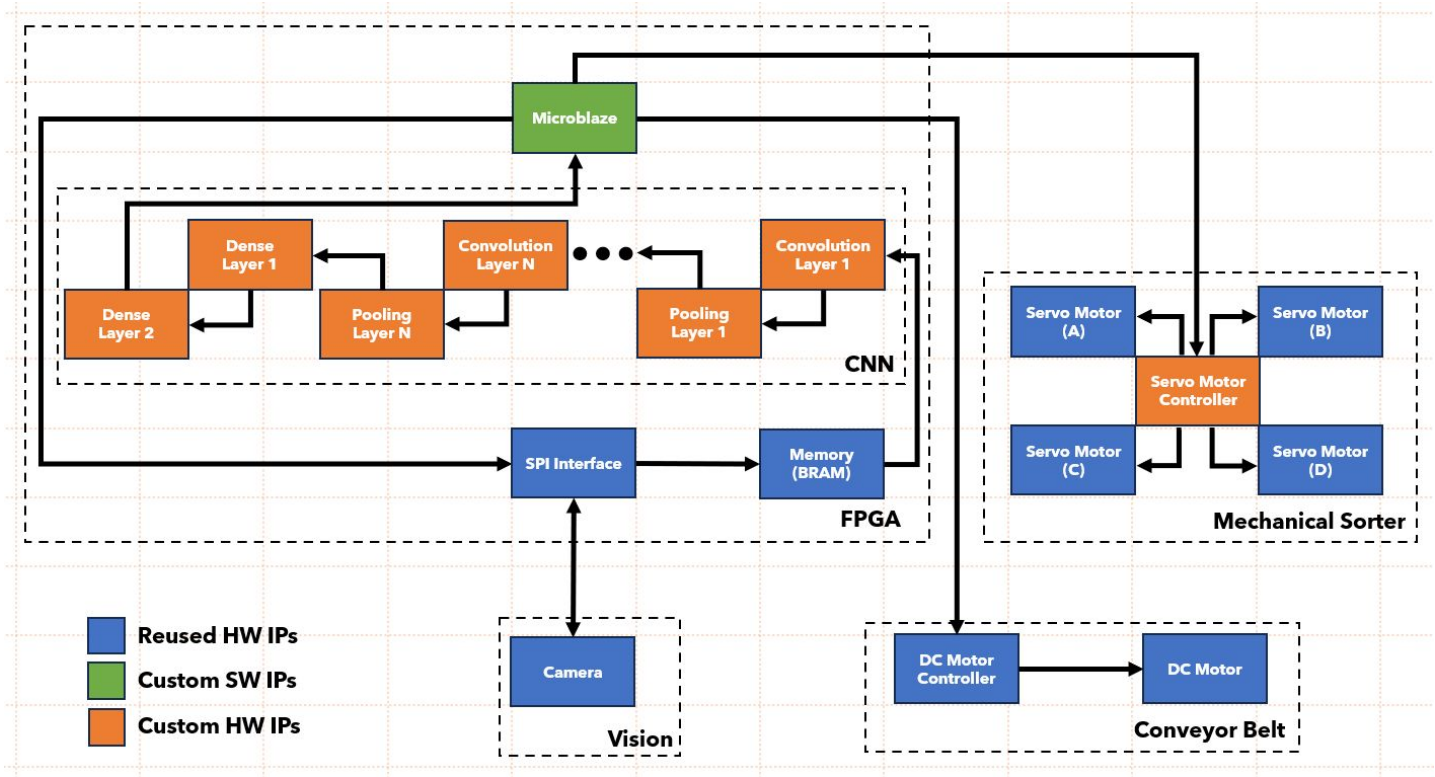
Project Overview



Block Diagram

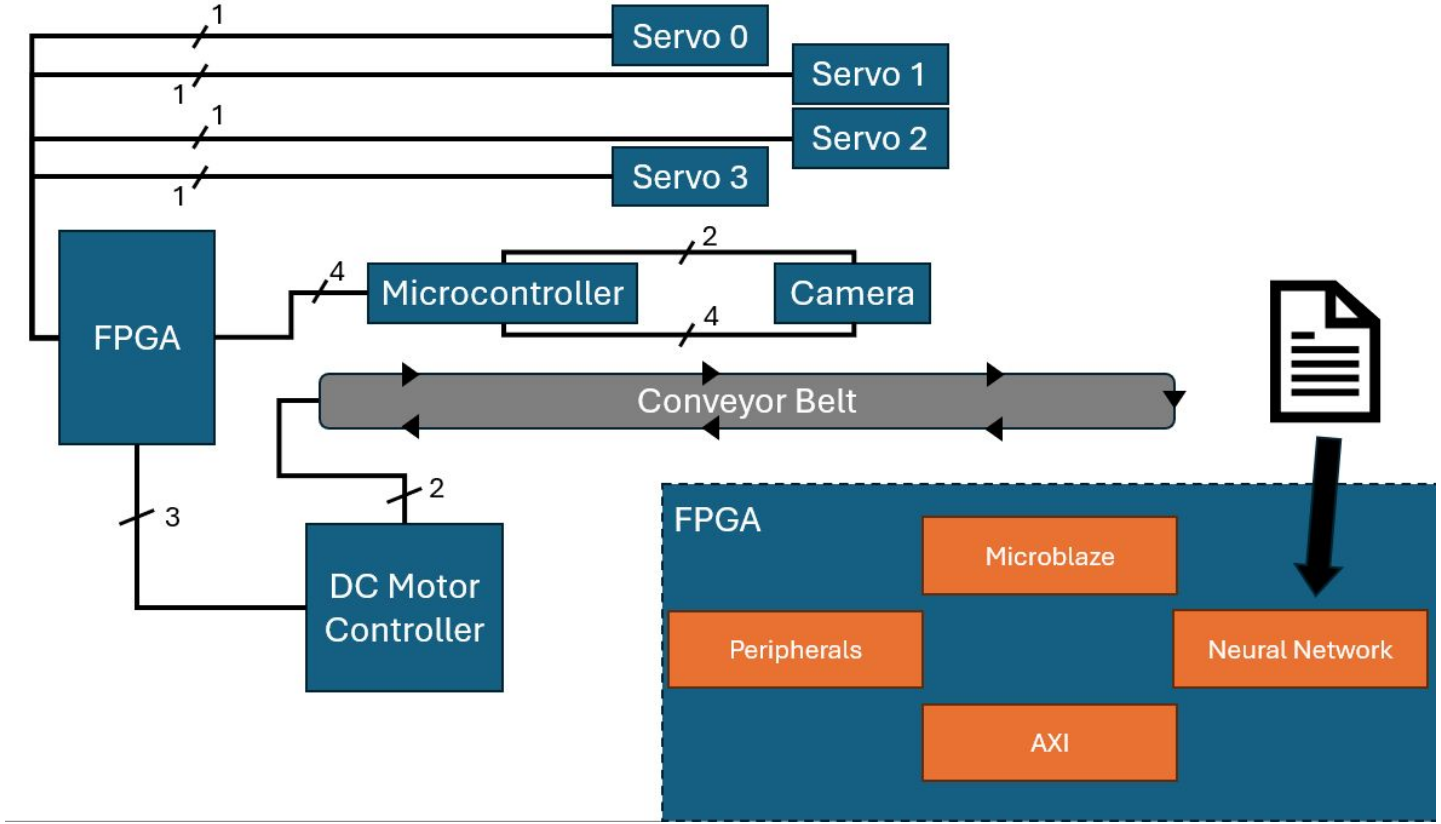


Challenges

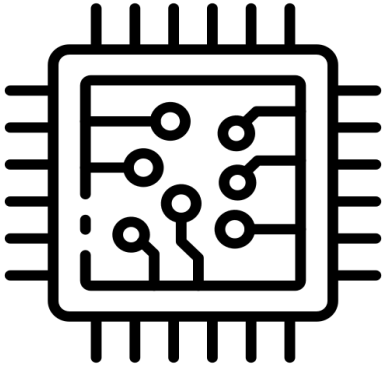
- Camera
  - SPI and I2C for communication
  - Lacking documentation
  - However, better performance and resolution

- Implementing Neural Network in Hardware
  - Time spent researching and experimenting
  - Was initially difficult to find a reliable method
  - Bridging between high level software and low level hardware implementation

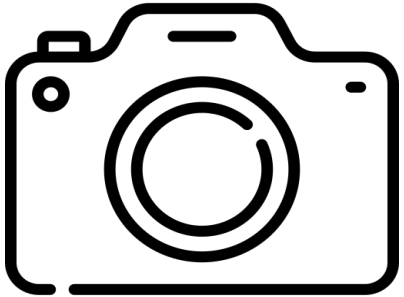
Demo


Servo 0
Servo 1
Servo 2
Servo 3
1
1
1
1
FPGA
4
Microcontroller
2
Camera
4
Conveyor Belt
3
2
DC Motor Controller
FPGA
Microblaze
Peripherals
Neural Network
AXI

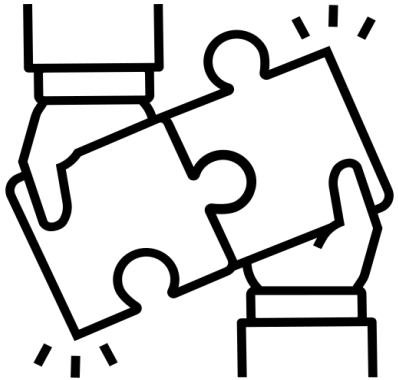
Next steps



Finalize model implementation in hardware



Complete camera integration with Microblaze



Finish remaining integration tasks

Final Demo

- Chosen application:
  - Sorting recycling objects: plastic, paper, glass, metal
- Contingency:
  - Sorting items by numerical label or color

Demo Overview:

1. Conveyor moves object into frame
2. Conveyor stops and camera shoots photo
3. Photo is processed and inference is made
4. Servo actuated based on model decision
5. Conveyor moves object into paddle and object is pushed into a bin

Questions