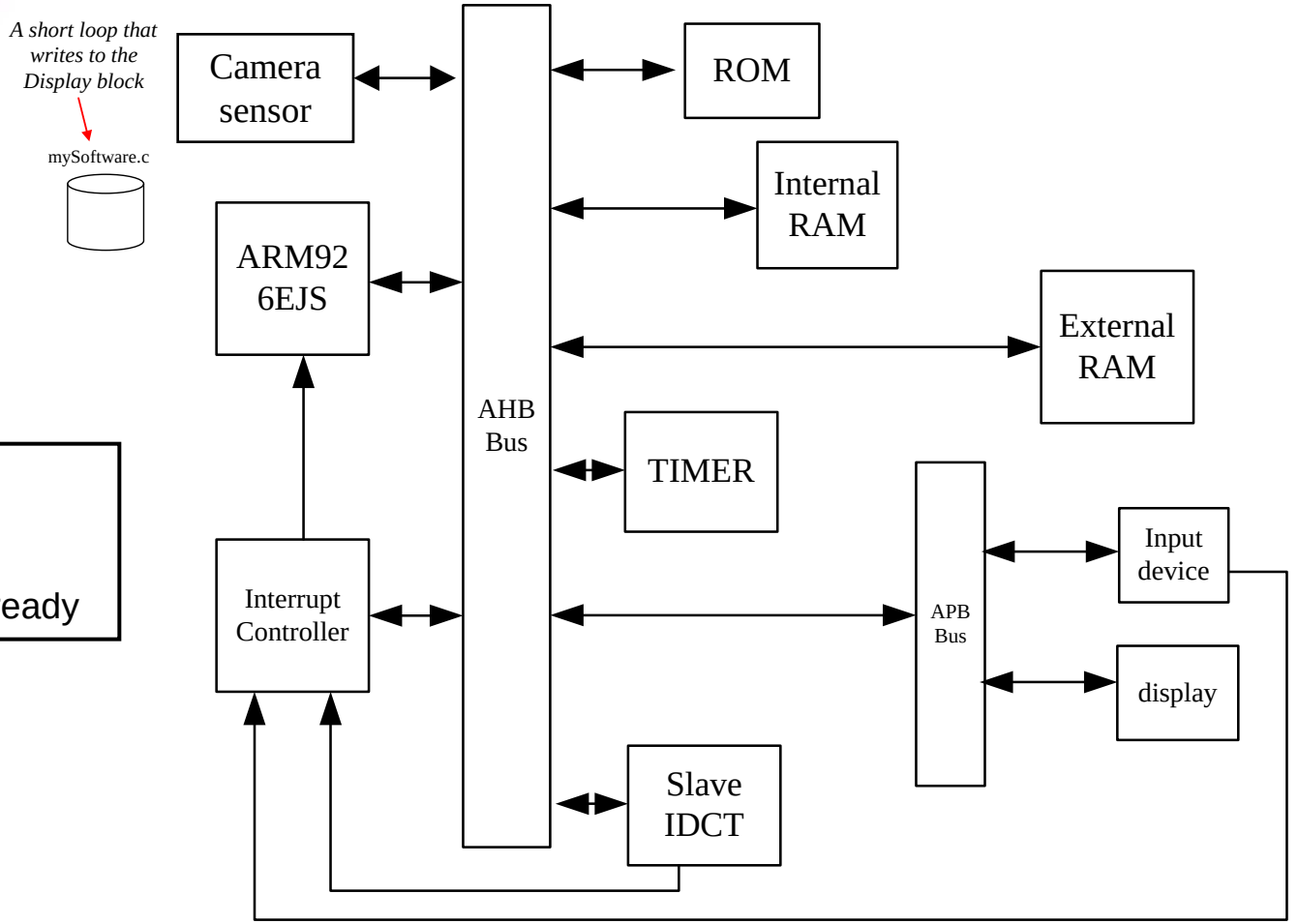
MSOC Final Project

Surveillance System

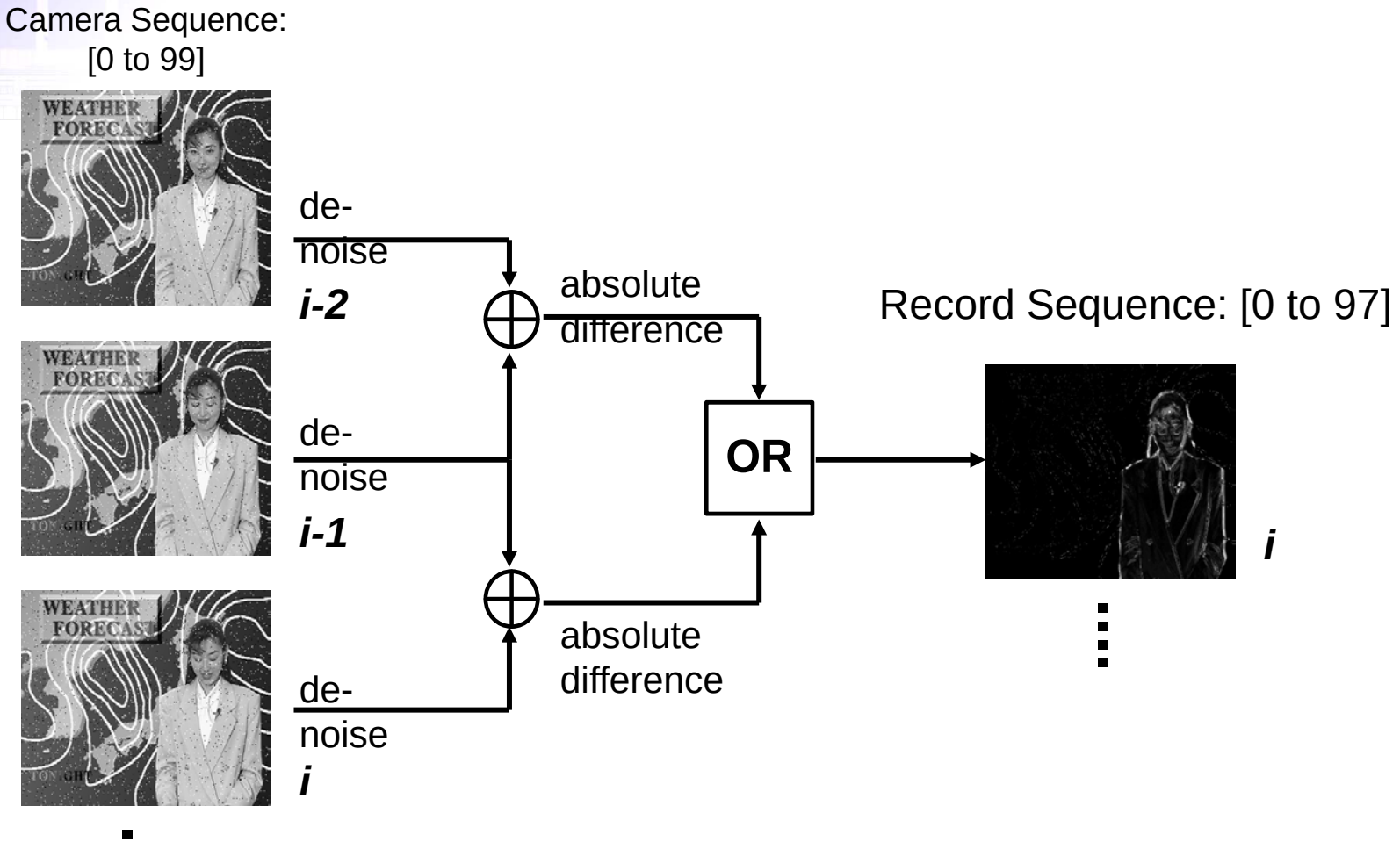
Project – MSOC Platform v2



Camera sensor

```
if is_enabled
    for every 33 ms
        buffer[W*H] is ready
```

Function View



Project – Software flow

While (read *status* of the sensor) {

(1) skip frames if needed according to *status*

(2) read one frame to internal memory

(3) de-noise the frame

(4) if (read_in_frame_num < 3)

save frame into External memory, then goto (2)

else

save frame into External memory , then go (5)

(5) segmentation (frame1, frame2, frame3)

(6) write out frame

}

Basic Requirements

- System constraints ➔ do not change!
  - Clock frequency: 100MHz (10ns/cycle)
  - Internal memory size: 7Kbytes
  - External memory size: 20Kbytes
  - Frame size: 88x72 in gray scale
- No frame skipping
- Write out result must be done in the CPU
- Only the following approaches can be used
  - Add hardware de-noise accelerator on AHB
    - At least 6336 cycles/frame
  - Add hardware segmentation accelerator on AHB
    - At least 6336 cycles/frame
- Try to claim your hardware cost is minimum

Advance Topic

- Improve the performance of the system
  - The criterion is the frame rate to apply read/write/de-noise/segment frame
  - Possible directions
    - DMA
    - Change bus structure to multi-layer bus
    - Modify the functions of IPs
  - Please show the pros and cons about your modification

- Analysis for any modification is important

Grading

- Basic Requirements
  - 70%
- Detailed analysis
  - 10%
- Use AXI
  - 10%
- HDL Co-simulation
  - 10%
- Create more realistic environment
  - 10%

Deadline

- Project presentation
  - 6/7, 6/14, 6/21
- Upload *project file* and *presentation slide* **before presentation**
- Don’t need to write report, only need to present
- Please present more details