Design and Implementation of an FPGA-based Real-Time Face Recognition System

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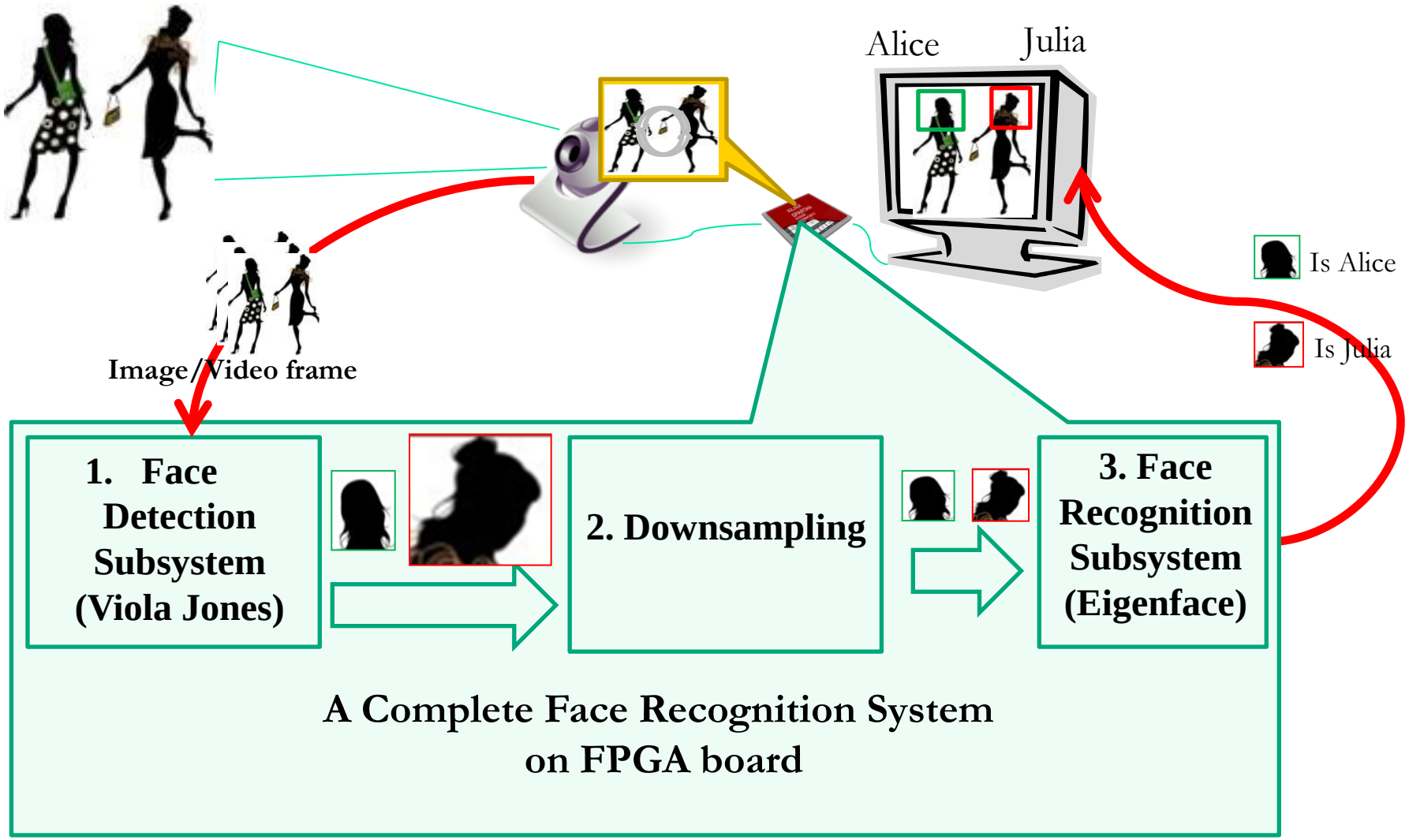
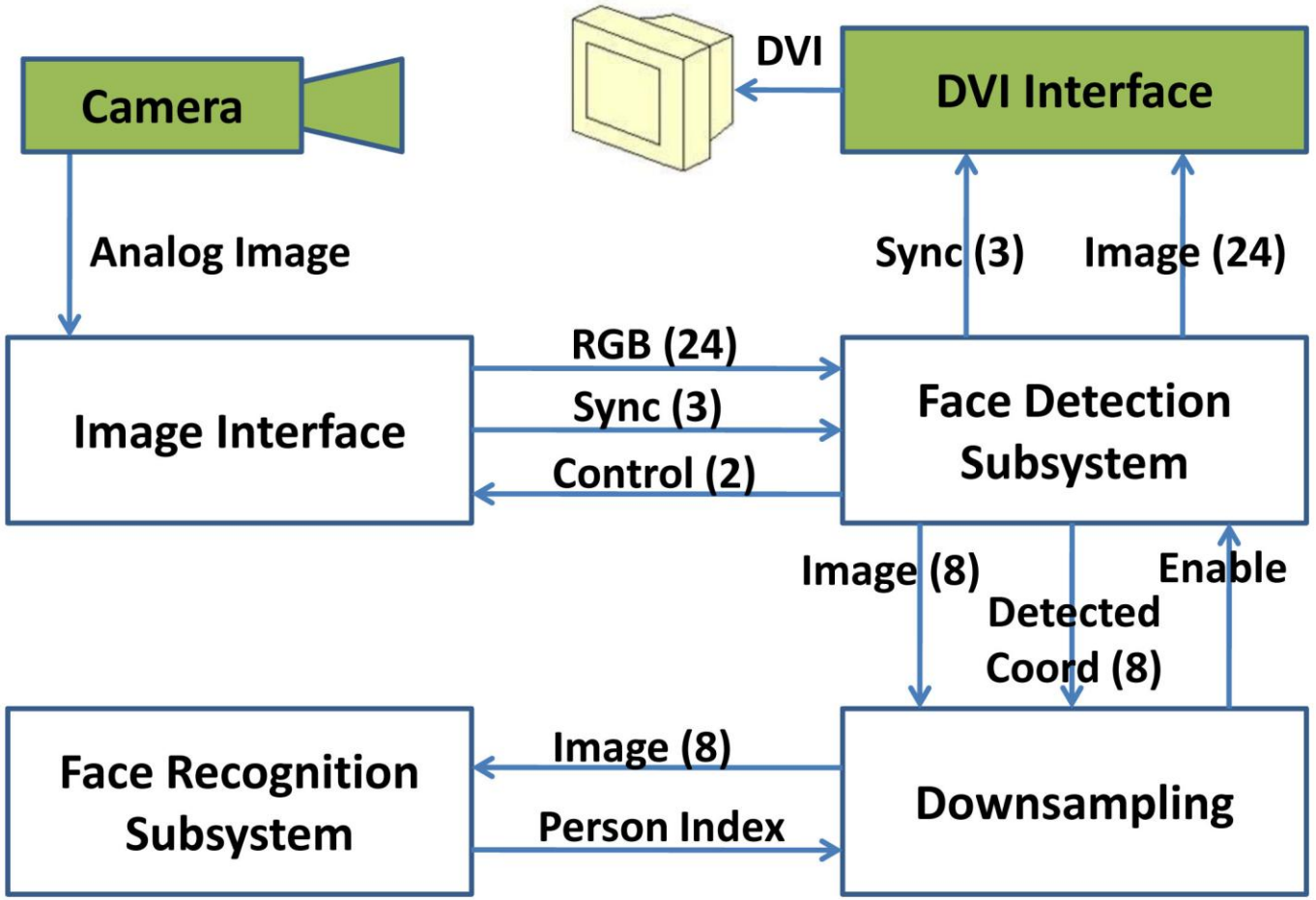
Face Recognition

- Face Recognition Applications
  - Security, Intelligent Robots, Biometrics, HCI,..
- Face Recognition System Characteristics
  - Real-time
  - Embedded
  - Accuracy
- Current Face Recognition Systems
  - Input: Only a face image
- A Complete Face Recognition System
  - Input: Arbitrary image

A Complete Face Recognition System

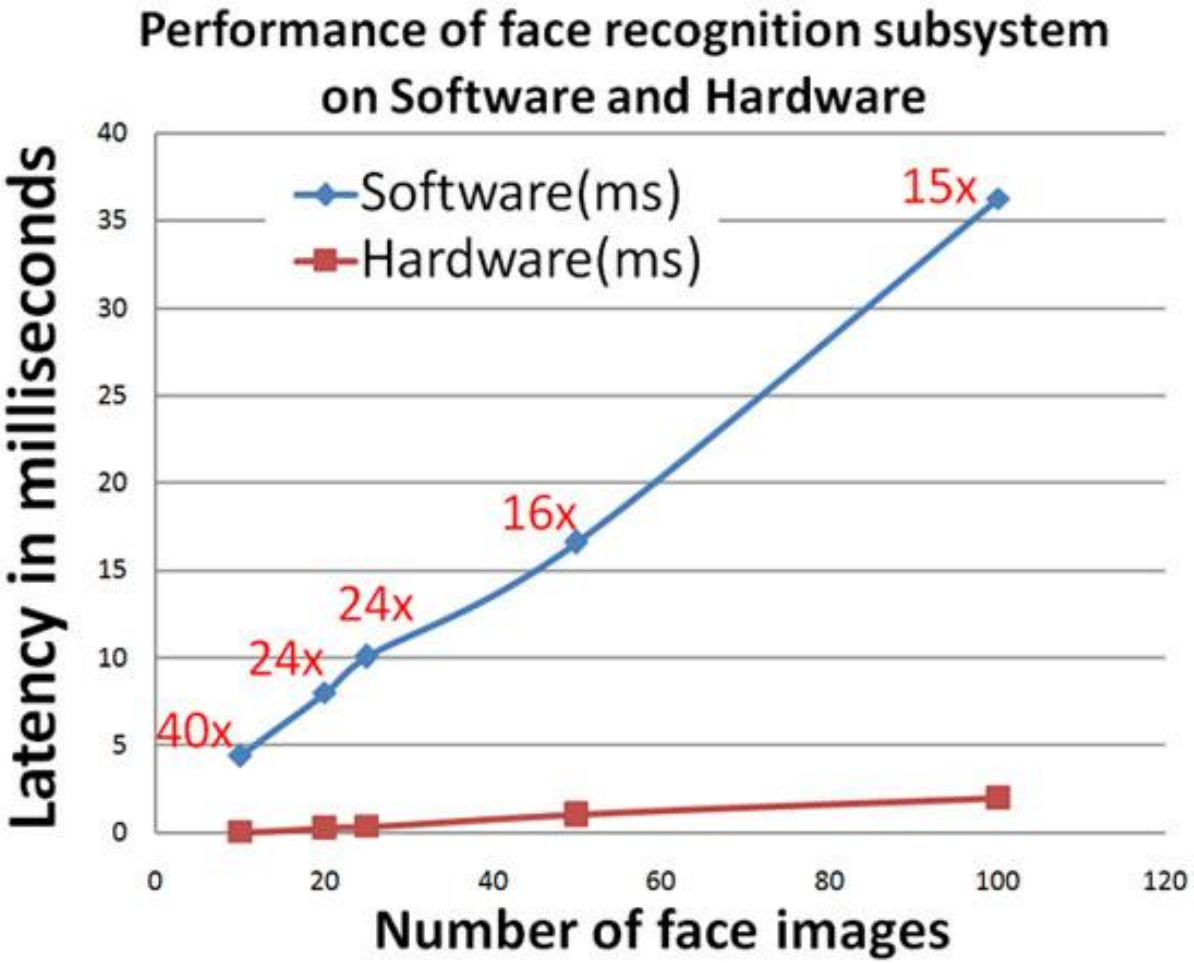


A Complete Face Recognition System



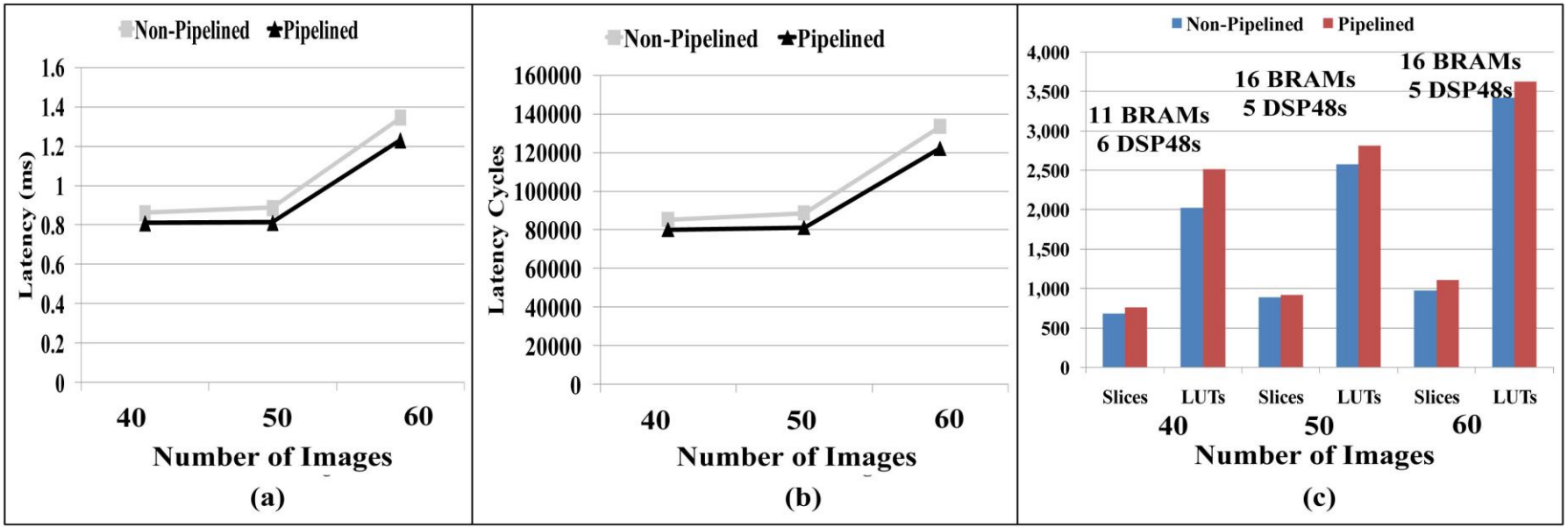
Experimental Results

- SW vs. HW Face Recognition
  - 23.8 X



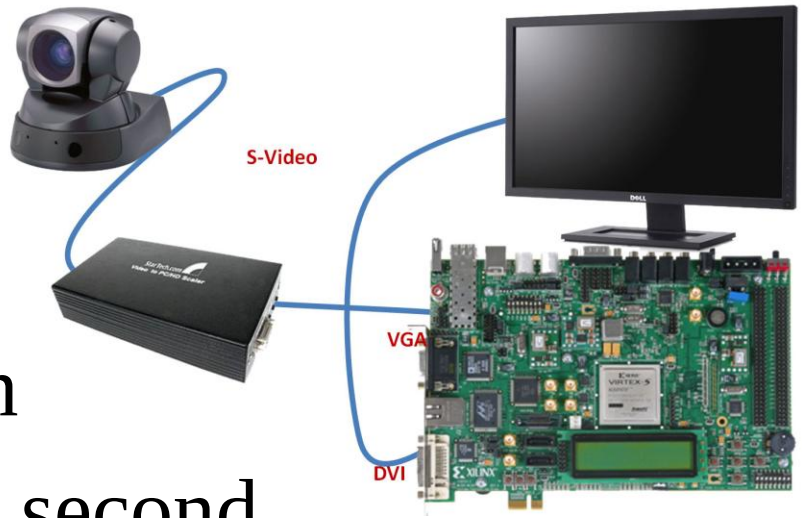
Experimental Results–cont'd

- Pipelined vs. Non-Pipelined



Experimental Results–cont'd

- Experimental set-up



- Hardware implementation
  - Average 45 frames per second
  - Virtex-5 FX70T FPGA

Logic Utilization	Used	Available	Utilization
Slices	8,683	11,200	77%
Number of Slices LUTs	32,480	44,800	72%
Number of Block RAMs	84	148	56%
Number of DSP48s	11	128	8%

Conclusion