Correlation Filter Cascade for Facial Landmark Localization

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Introduction

- Task: detecting facial landmarks

- Challenges: face occlusion, pose and expression in images

- Method: we proposed to cascade a set of correlation filters for detecting facial landmarks

Cascade Framework

- The size of correlation filters decreases from lower to higher levels
- Filters at lower levels are trained using full face images. They capture face shape and are robust against wrong detection caused by landmarks with similar appearance such as the right and left eye
- Filters at higher levels are trained using smaller patches. They are more robust against face pose, expression and occlusion. The search region of higher levels are determined by the detection of lower levels.
- The final detection is the average of detections over all levels
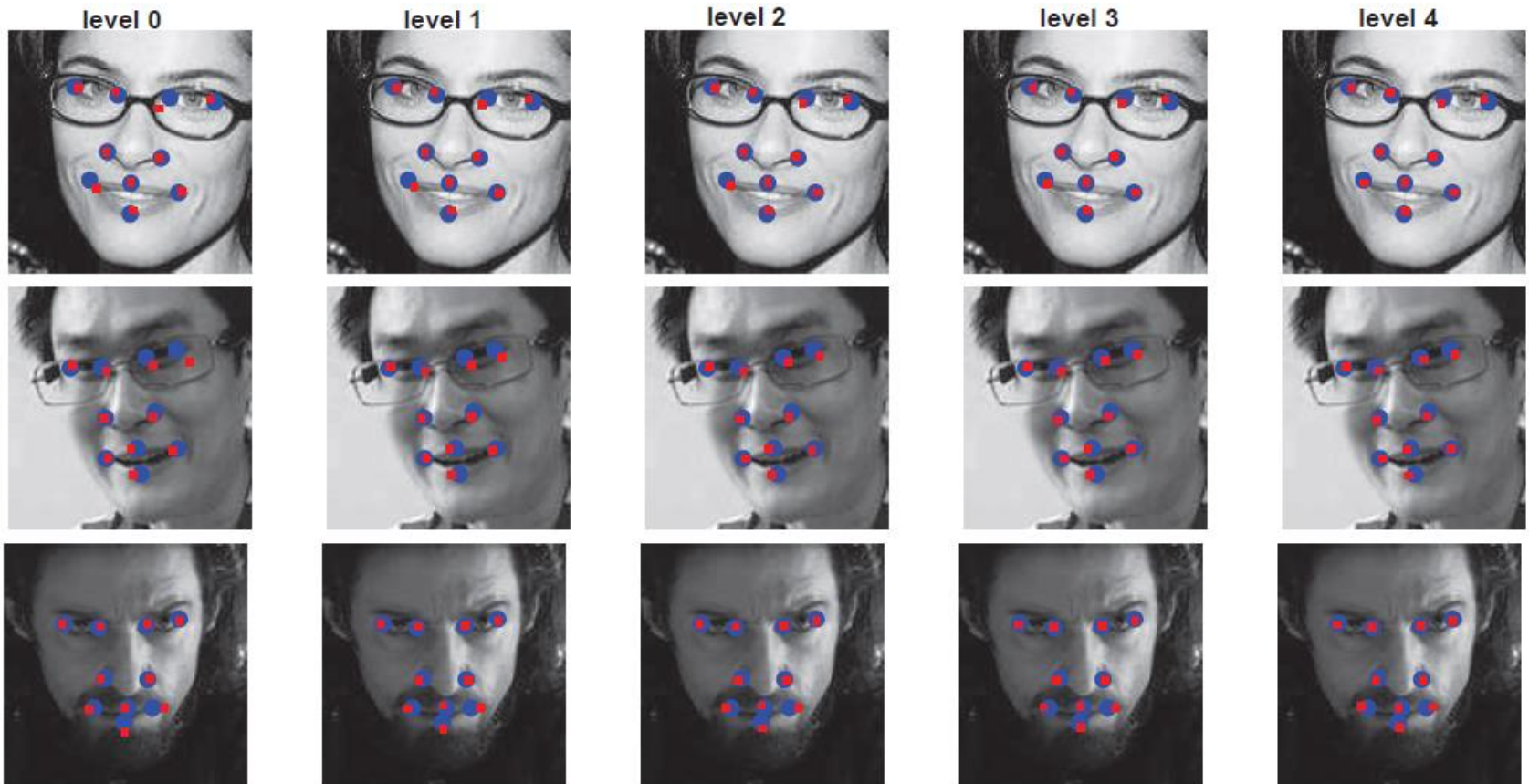
Cascade Framework 2

- The size of correlation filters decreases from lower to higher levels
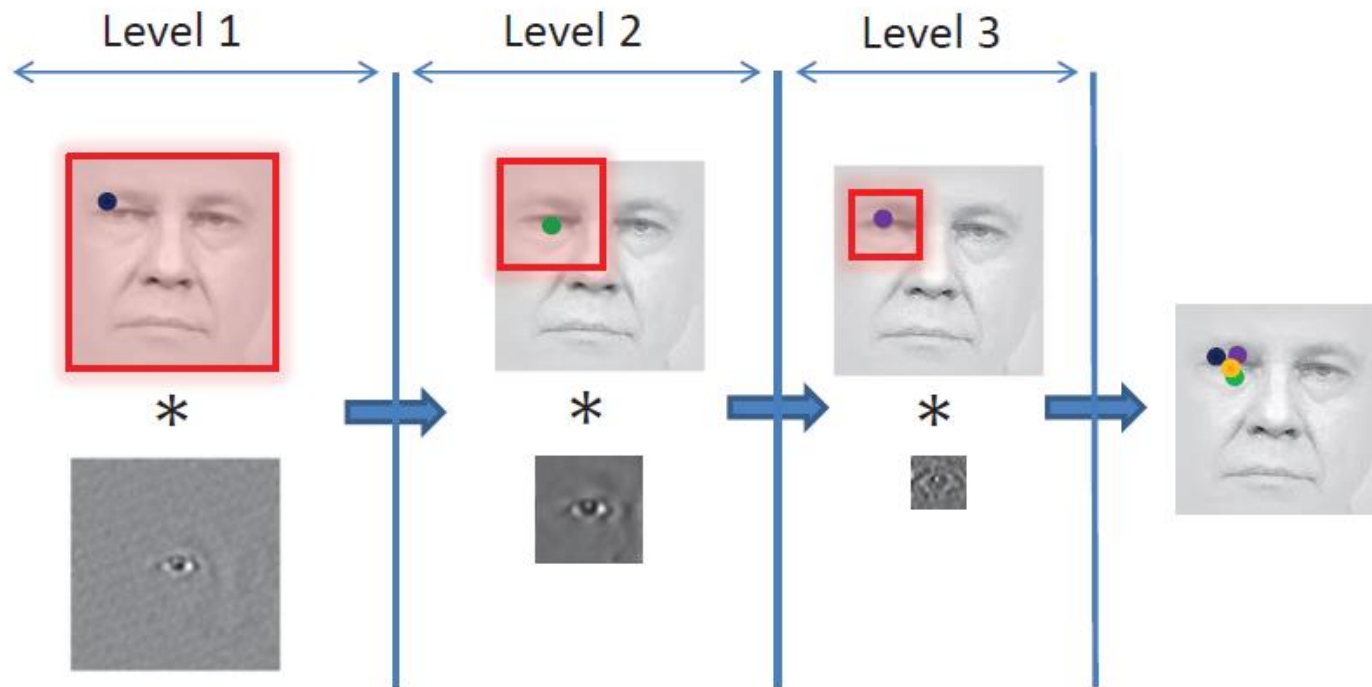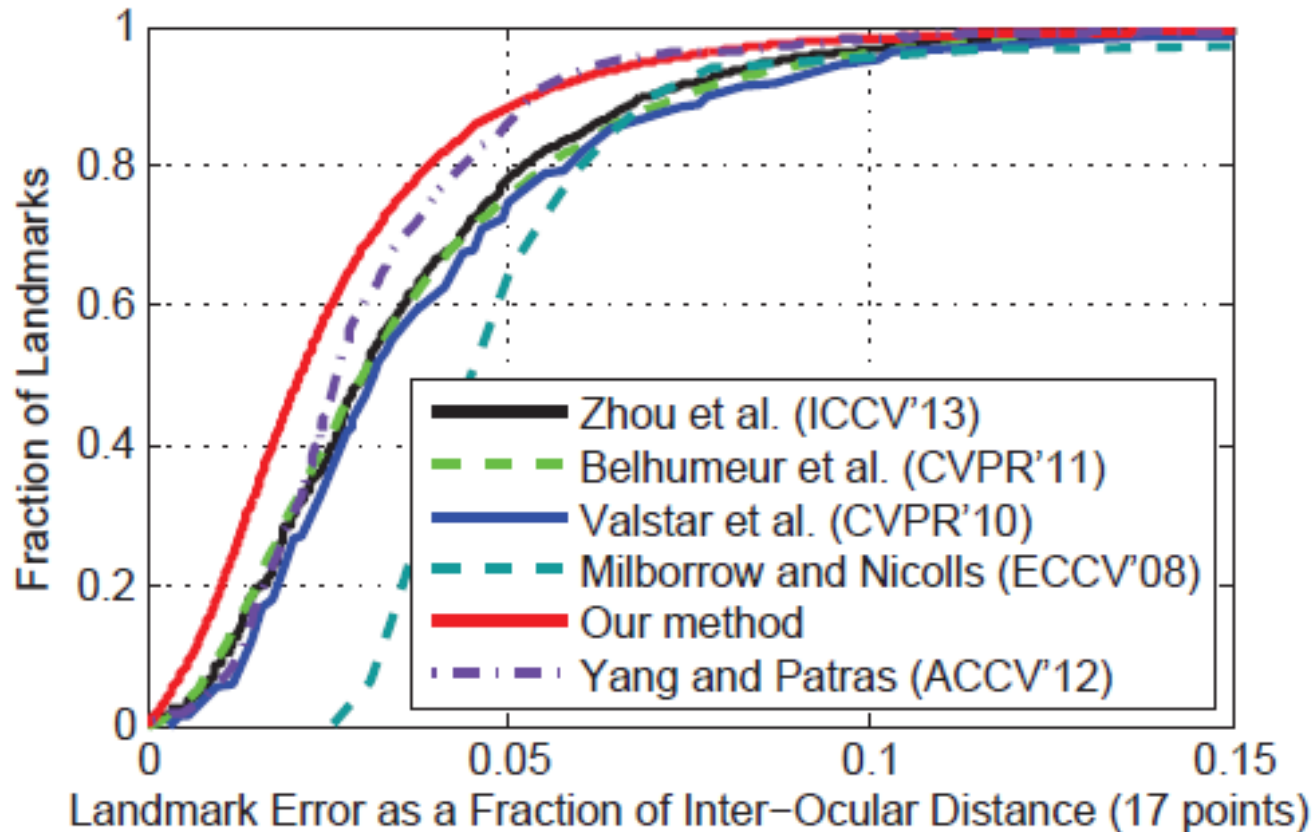
Experiments

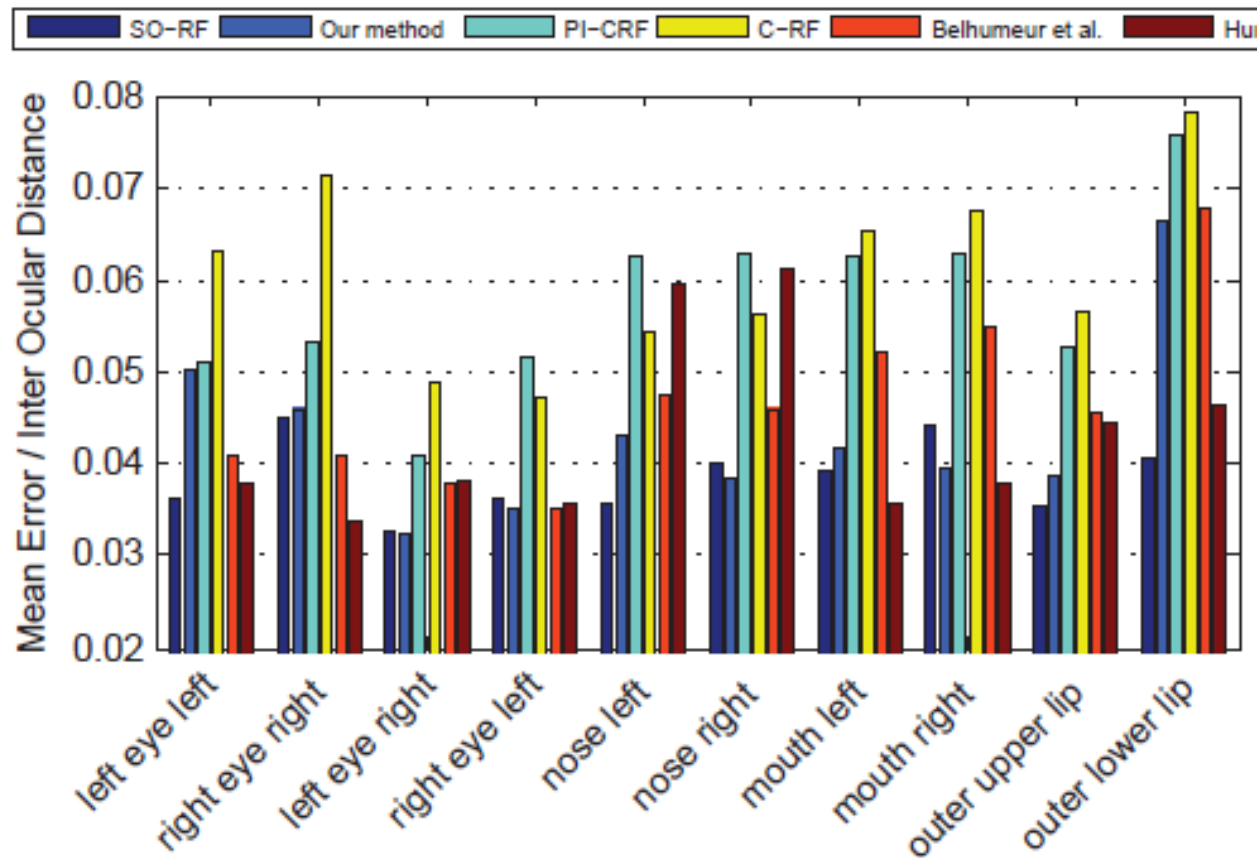- Refinement over levels: GT(blue), detections (red)
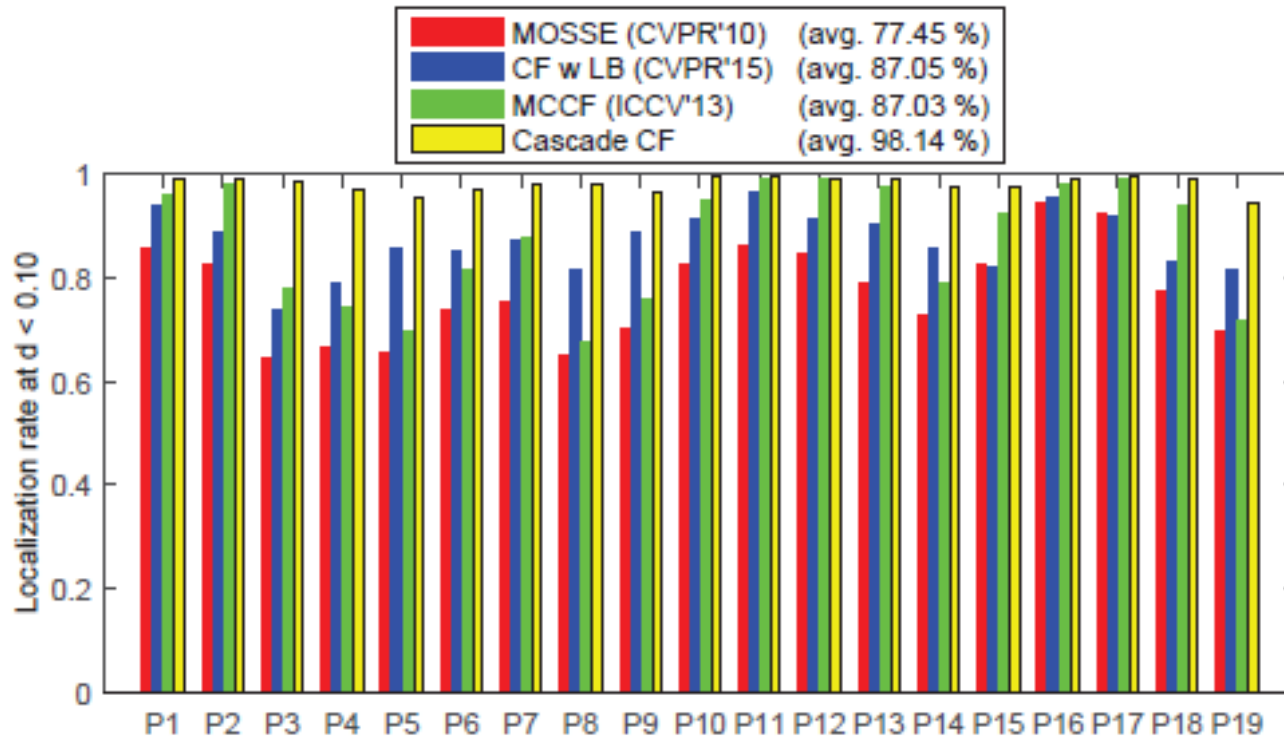
Experiments 2

- Results on BioID dataset

Experiments 3

- Results on LFPW dataset

Experiments 4

- Comparing with prior CFs on BioID

Experiments 5

- Detection Results: blue GT, red detection

Conclusion

- A cascade framework is proposed for detecting facial landmark

- Robust against occlusion, pose and expression

- Robust against landmarks with similar visual appreance

- Very fast. 2.5 ms to detect a landmark in a 128 x 128 face image

- Superior results compared to prior techniques

Q&A