

Face Detection And Tracking In Video To Facilitate Face Recognition In A Visual Prosthesis

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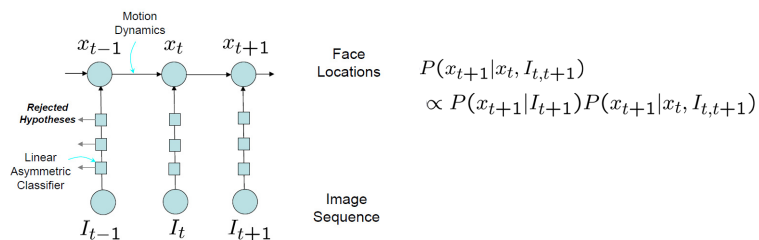
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Purpose

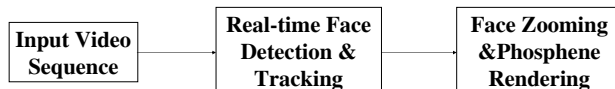
- Previous study shows faces may be recognized at 32x32 resolution (Thompson et al 2003).
- Facilitating face and expression recognition with low-resolution retinal implant array.
- Developing a real-time system capable of automatically detecting, tracking and zooming onto faces.

Methods

- Based on an improved boosted cascade classifier and statistical machine learning (Chunhua et al 2010).
- Incorporating temporal dynamic information to stabilize detection results.



- Zoomed in faces are kept still in the image over time in continuous video to facilitate recognition and expression recognition.



Reference

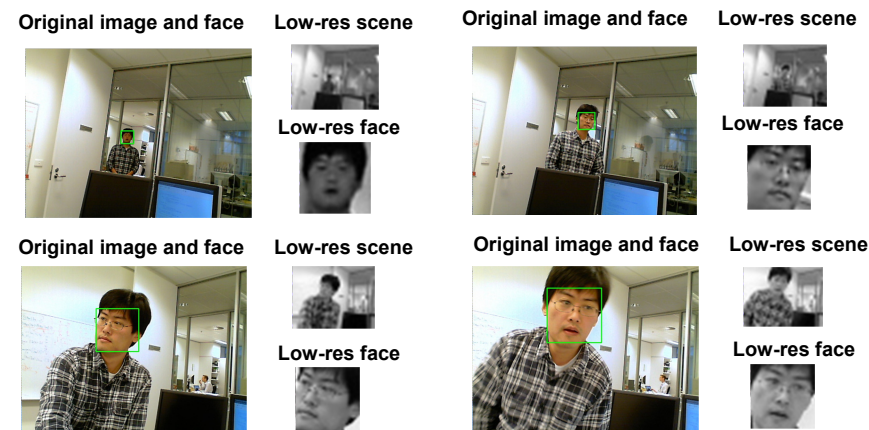
- Thompson RW Jr, Barnett GD, Humayun MS, Dagnelie G. Facial recognition using simulated prosthetic pixelized vision. Invest Ophthalmol Vis Sci. 2003 Nov;44(11):5035-42.
- Chunhua Shen, Peng Wang, Hanxi Li Lacobost and fisherboost: optimally building cascade classifiers. European Conference on Computer Vision (ECCV'10).

Results

- The system can reliably detect and robustly track faces within distance of 0.5 to 5 meters in a normal indoor environment.
- Figure shows results of our system across a live sequence in high resolution, The zoomed face window provides rich and informative cues for identity and expression recognition.



- Instances from a range of distances



Conclusions

- A top-down saliency and face-based fixation system has been built to provide retinal prosthesis recipients the ability to zoom onto faces at varying distance.
- This new component can be helpful for improving their recognition by selectively sending relevant information to low resolution devices.

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