Project 2 Report

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Approaches improving wink detection and shush detection:

1. Parameters modification in cascade classifier

ScaleFactor is a parameter specifying how much the image size is reduced at each image scale; minNeighbors is a parameter specifying how many neighbors each candidate rectangle should have to retain it. I got better results via adjusting those two parameters to better fit testing photos.

1. Parameters modification in FACE detecting area

A lot of times during wink detection process, nostrils are sometimes detected as eyes, so I reduced the eyes detecting area to upper half of a face.

1. Using contrast limited adaptive histogram equalization

Ordinary histogram equalization uses the same transformation derived from the image histogram to transform all pixels. This works well when the distribution of pixel values is similar throughout the image. However, when the image contains regions that are significantly lighter or darker than most of the image, the contrast in those regions will not be sufficiently enhanced. Contrast limited adaptive histogram equalization improves on this by transforming each pixel with a transformation function derived from a neighborhood region, and it is a variant of adaptive histogram equalization in which the contrast amplification is limited, so as to reduce noise amplification.

Result of detecting wink: The program could correctly detect 19 out of 24 images

Result of detecting shush: The program could correctly detect 16 out of 21 images