

COMS30121: Assignment 2 Report

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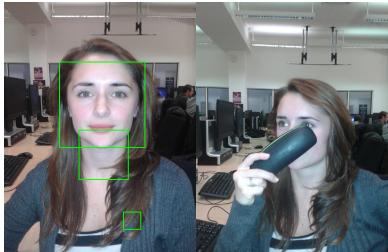
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Task One - Obama

obama0.jpg is the clearest example of a frontal face (resulting in successful detection): features are clearly defined, well lit and not occluded. **obama2** also positively classified, despite partial occlusion below the nose by the hand, possibly due to the brightness contrast between the fingers, which could suggest a mouth shape, e.g. a horizontal line Haar feature used over the mouth during training would still result in a positive output. However too much occlusion in **obama5** produced false negative (left eye, nose and chin all covered).

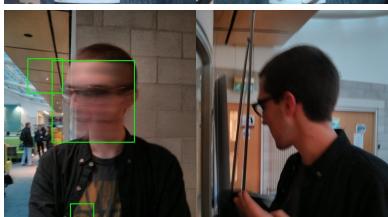
obama1 and **obama9** produce false negatives: the head is rotated but rotated examples not in positive training data of frontal face classifier; for obama9.jpg left eye completely occluded by rotation, also solar flare projects lines on face which may alter feature detection. **obama3** LHS of face completely occluded by light hiding features, faces in crowd not detected as out of focus, no clear features. **obama4** has false positive in the sky, clearly has no obvious facial features so probably error in training data e.g. no images in negative examples with very little or no contrast. Face successfully detected as darkness of sunglasses mimics eyebrows and cheek could be detected as a nose due to shading either side. **obama6** False negative 1 and 2: possible contrast in frame that could suggest a face; perhaps use edge detection to fix, false negative 3: mouth - could be seen as positive, since it's part of a face, positive: not quite on the whole face but recognises eyes/nose. **obama7** false negative; probably due to the face being a profile shot and not a frontal shot; changing the positive data to include profile images would probably fix this. **obama8** false negative; image is squashed, distorting the features; if the scaling isn't equal, i.e. if height increases, width increases, then the haar features won't be accurate since they don't take unequal scaling into account. **obama10** is a caricature of Obama and intuitively would be successfully detected as this style of drawing accentuates facial features, the upshot being that the differences in the Haar features are increased. **obama11** is a distorted version of obama10 and classification outputs a near success (missing the bottom lip) and a false positive. Positive training data may not have included teeth so large! They may be interpreted as the chin by a feature as they are lighter than the upper lip, which could be the entire mouth.

Task One - Ourselves



Correct image: Positives: Successfully found a face in the first image; the face is frontal lol and there are distinct features. There are two false positives; contrast could suggest a face. One could be fixed by not allowing any overlapping detection boxes.

Incorrect image: Most of the face is occluded. Since only the eyes are visible, the detector cannot recognise this as a face. No other faces have been detected.



Correct image: although motion blurred still a successful detection as contrast of dark eye area and forehead preserved and darker mouth area still present.

Incorrect image: no detections as all facial features hidden by extreme rotation.



Correct Image: The face is detected successfully because the eyes are darker than the forehead. Meanwhile, the nose is brighter than the cheek.

Incorrect Image: The face isn't detected as almost half face is hidden by a notebook. No such kind of facial features are trained in the generated Haar-Like features. There are two false positives because there are dark lines between white lines, which is like the eyes between the forehead and the cheek.