

Image Classifiers

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Presentation Outline

- General information on IMCOP project
- Age classifier
- Bokeh effect detector
- Dominant colour of clothes (dresses)
- Dominant colour counter
- Nudity identification
- People counter
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- Red eyes detection
- Smile detection
- Unshaved faces

General Information on IMCOP Project

- IMCOP improves current approaches in field of digital preservation of:
 - IPTV, and
 - Internet Web-based content
- It provides comprehensive & extensive system for analysing, documenting & presenting:
 - Dynamic Web-based content, &
 - Complex, multimedia objects
- Reference:
<http://www.kt.agh.edu.pl/en/projekt/622>



Age Classifier

- Input:
 - RGB image of face
- Description:
 - Classify whether face belongs to human $<18 <$ yo (re-trainable)
- Output:
 - Returns probability than face belongs to person >18
- References:
 - http://doi.org/10.1007/978-3-642-38559-9_18
 - <http://doi.org/10.1007/s11042-014-2114-z>



Bokeh Effect Detector

- Input:
 - RGB image of face
- Description:
 - Aesthetic quality of blur produced in out-of-focus parts of image produced by lens
 - In progress
- Output:
 - Binary (Bokeh effect, no Bokeh effect), probability
- References:
 - http://doi.org/10.1007/978-3-642-38559-9_18
 - <http://doi.org/10.1007/s11042-014-2114-z>



Dominant Colour of Clothes (Dresses)

- Input:
 - RGB image
- Description:
 - Designed to detect colour of dress of red-carpet image of actress
- Output:
 - Returns 1 of 8 basic colours (quantized) or a 9th value meaning „colourful”
- Reference: M. Grega, “*Method for Automated Identification of Celebrity Dress Colour*”, to appear soon



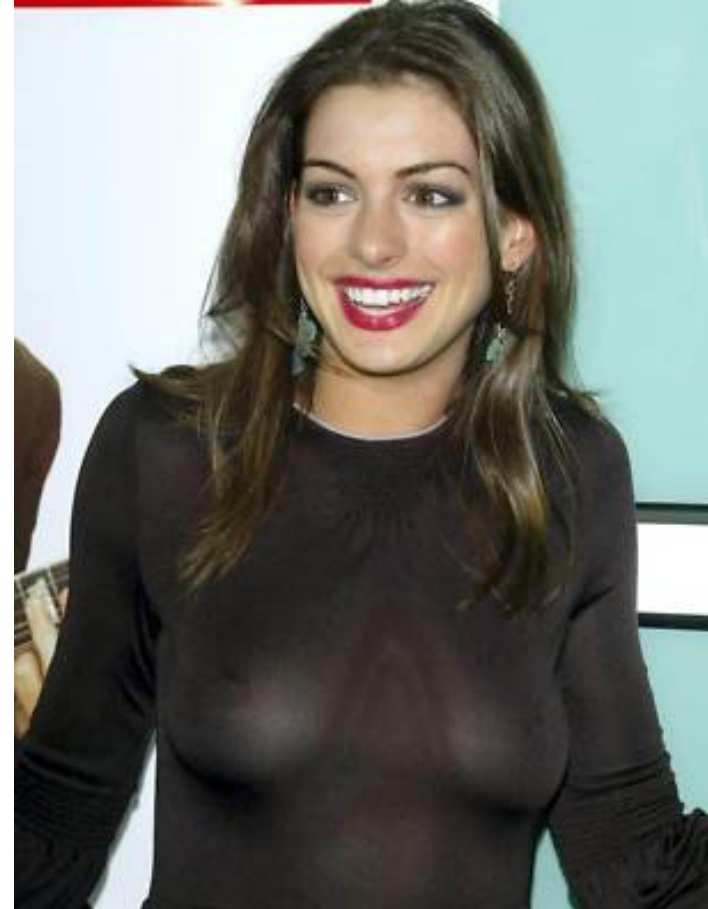
Dominant Colour Counter

- Input:
 - Any RGB image
- Description:
 - Identifies dominant colours in image
- Output:
 - According to the MPEG-7 standard:
 - N – number of dominant colours
 - c – RGB values
 - p – percentage of given colour
 - v – colour variance (optional in standard, not supported)
 - s – spatial coherency

$$\bar{F} = \{ \{c_i, p_i, v_i\}, s \}, (i = 1, 2, \dots, N)$$

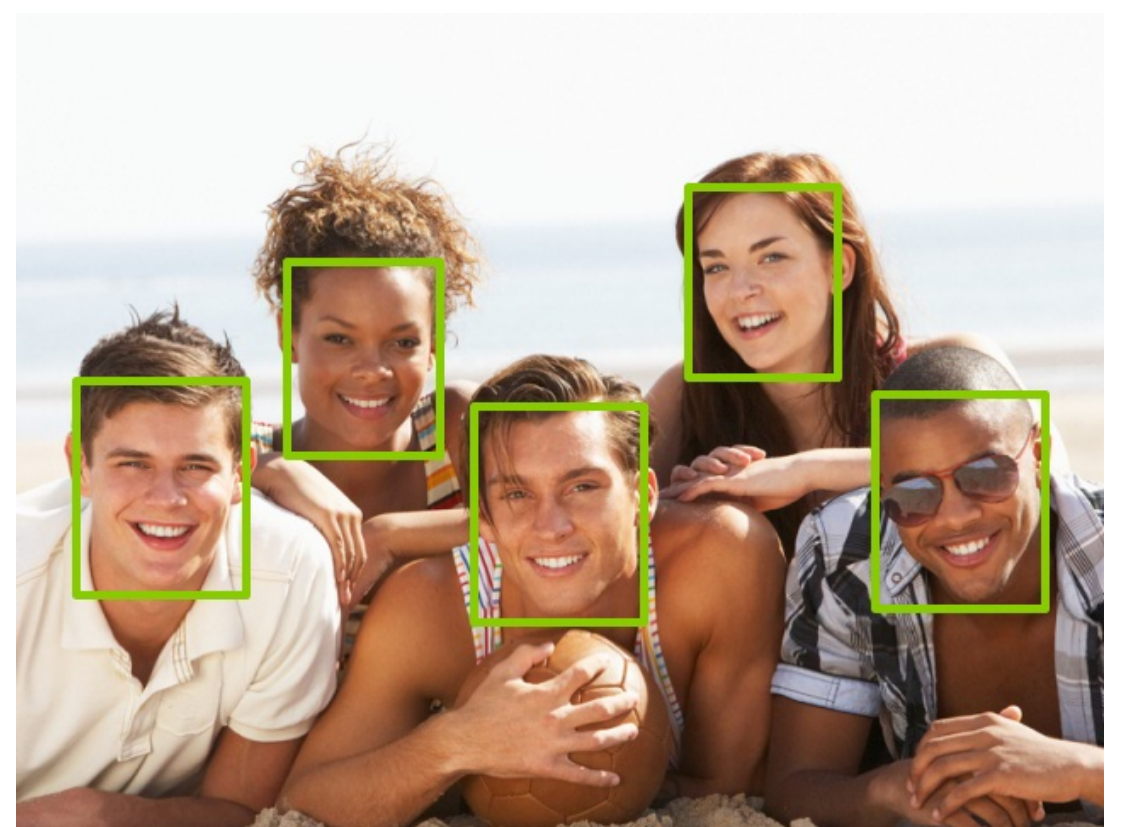
Nudity Identification

- Input:
 - Any RGB image
- Description:
 - Checks whether image contains nudity or not (basing on colour and shape information)
- Output:
 - Returns the probability that image contains nudity
- References:
 - http://doi.org/10.1007/978-3-642-38559-9_18
 - <http://doi.org/10.1007/s11042-014-2114-z>



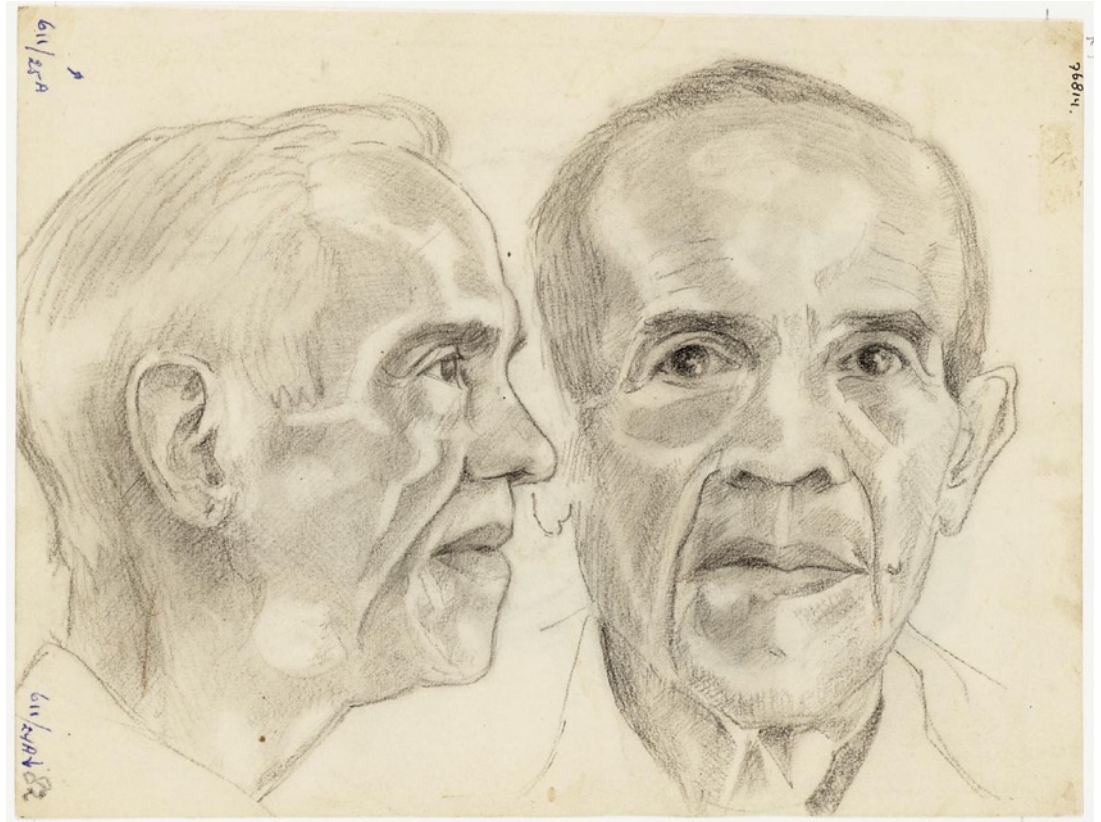
People Counter

- Input:
 - RGB image of faces
- Description:
 - Counts number of en-face faces in the image
 - (Trivially) based on Open-CV Haar cascade
- Output:
 - People count
- References:
 - http://doi.org/10.1007/978-3-642-38559-9_18
 - <http://doi.org/10.1007/s11042-014-2114-z>



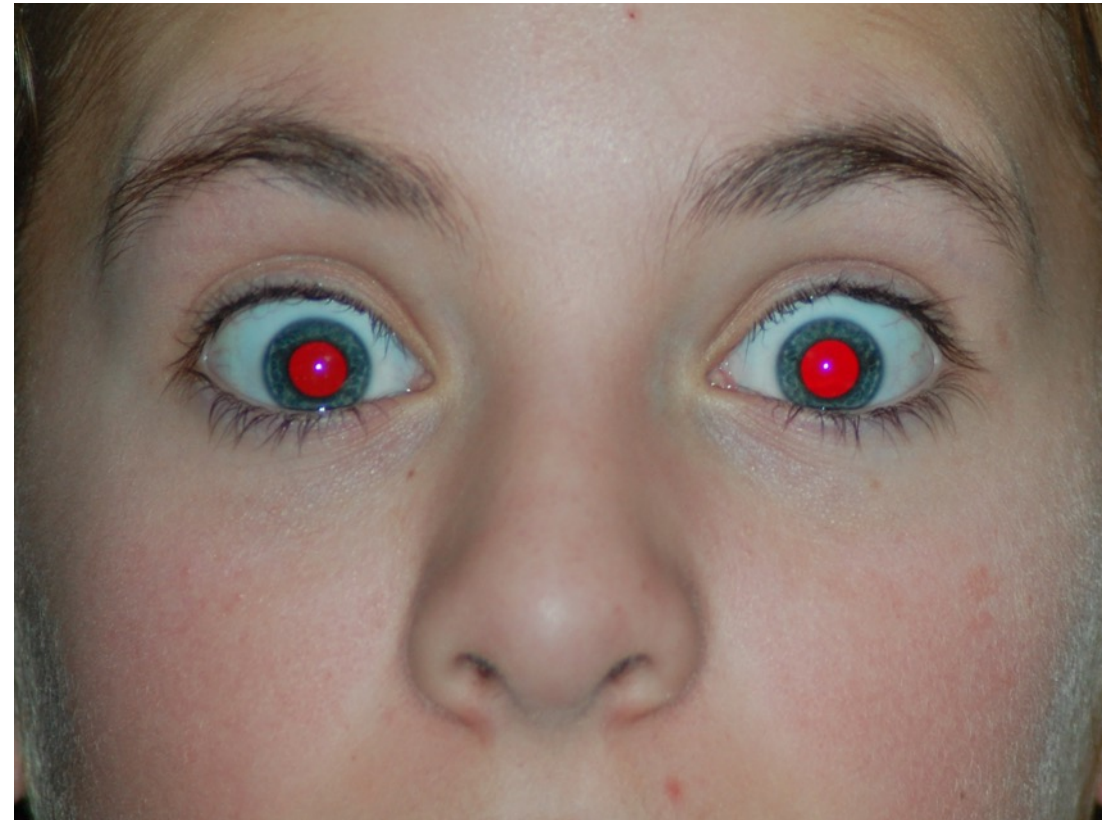
Profile/En face Classification

- Input:
 - Grey-scale image of face
- Description:
 - Classifier based on Support Vector Machines (SVM) & Local Binary Patterns (LBP)
- Output:
 - Class (left, right, frontal), probability
- Reference:
http://doi.org/10.1007/978-3-642-21512-4_17



Red Eyes Detection

- Input:
 - RGB image of face
- Description:
 - Algorithm first finding pupils
 - In next step, red colour probability calculated for each pixel
 - Output: weighted probability, weights to be inverses of distances from pupil
- Output:
 - Weighted redness $\in (0,1)$
- References:
 - http://doi.org/10.1007/978-3-642-38559-9_18
 - <http://doi.org/10.1007/s11042-014-2114-z>



Smile Detection

- Input:
 - Grey-scale image of face
- Description:
 - Classifier based on SVM & Haar Wavelets
- Output:
 - Binary (smile, non-smile), probability
- References:
 - http://doi.org/10.1007/978-3-642-38559-9_18
 - <http://doi.org/10.1007/s11042-014-2114-z>



Unshaved Faces

- Input:
 - Grey-scale image of face
- Description:
 - Classifier based on skin colour probability and SVM
 - Least accurate, need some polishing, mainly manual samples labelling
- Output:
 - Binary (shaved, unshaved), probability
- References:
 - http://doi.org/10.1007/978-3-642-38559-9_18
 - <http://doi.org/10.1007/s11042-014-2114-z>

