Mood player

Team 20 R漱漱一

Team Members

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Job: Take the face

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Job: Beauty the face

Collaboration mechanism:

- Github https://github.com/sean2249/AI_Project_FaceDetection

Background

We listen to MUSIC when we're GLAD

We listen to MUSIC when we're SAD

We listen to MUSIC when we're MAD

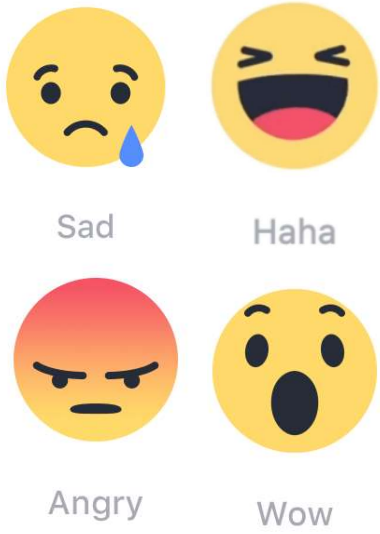
Our mood decide what we want to listen!!

- Every time we'd like to play some songs, usually we will choose a song that we already known before.
- If we would like to try something new, the only way we do is to judge the song by its title.
- If it hits our moods, it's nice; but if it don't…

Problem definition

Let's build a system that automatically provide songs by user's mood.

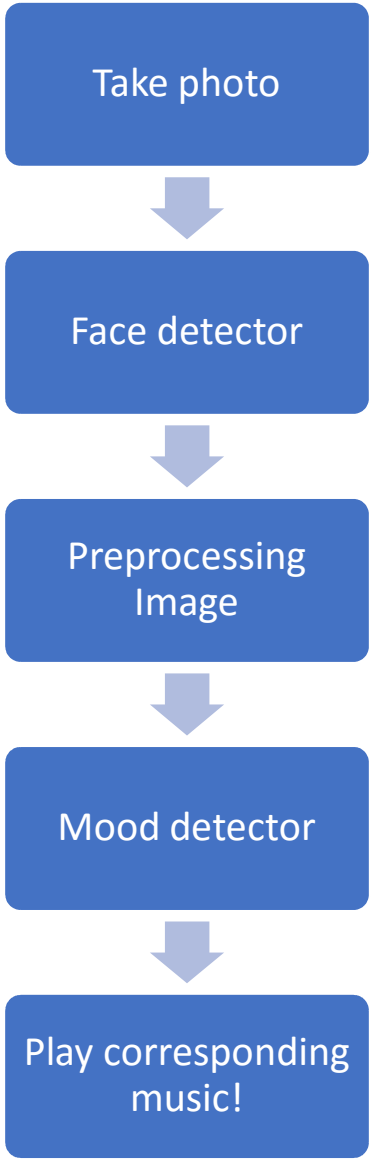
- Problems:
  - How to get user's mood?
  - How to extract faces feature in photos?
  - How does computer decide one's mood?
  - How to improve our system accuracy?
  - How to combine with music recommend?



Proposed methods

- Input stage
  - Take one's picture on the camera of laptop.
- Pre-processing stage
  - Draw ROI by MATLAB **vision.CascadeObjectDetector.**
- Feature computing stage
  - Quantize the face image into gray level.
  - Compute HOG of the face image extracted in the previous step.
- Train classifier (SVM)
  - Use KDEF images to pass through stage 1-3, to get train set and uses them to train SVM model.
- Classifying, play music
  - With the model, we can build our system.

KDEF: Karolinska Directed Emotional Faces http://goo.gl/h220y8

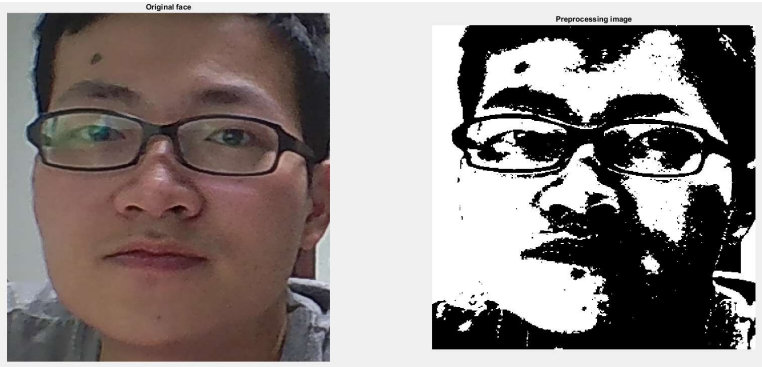


Results

- HOG
  - cellSize = [8 8], blockSize = [2 2]
- SVM
  - With train set of nearly 1000 images.
  - Validation accuracy 82%
    - Validation test image: 100
- Demo: Our tested with camera, laptop and speaker

Happy

Surprised



Afraid

Discussion

- Bad accuracy when trying to use gabor as feature extraction.
- Binary image is good for HOG extract.
- Work well (80%) in validation, but in our test often label to afraid, sad, happy.

Future work

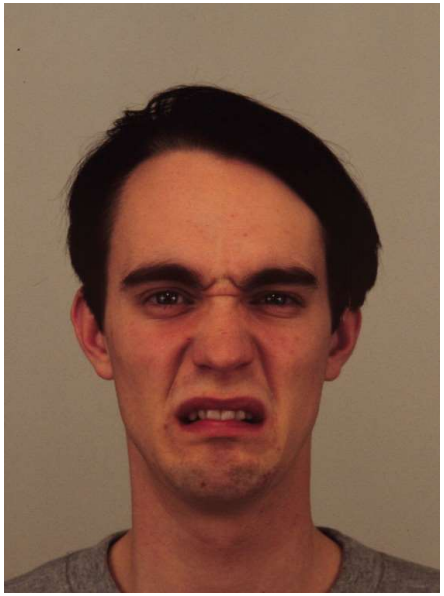
- Maybe AAM would improve performance of classifying?
- Facial expressions are hard to define?
  - (surprised vs afraid, discussed vs sad …)
- Improve our song recommend system by adding music mood classification which can collect user's song data.

KDEF

Happy

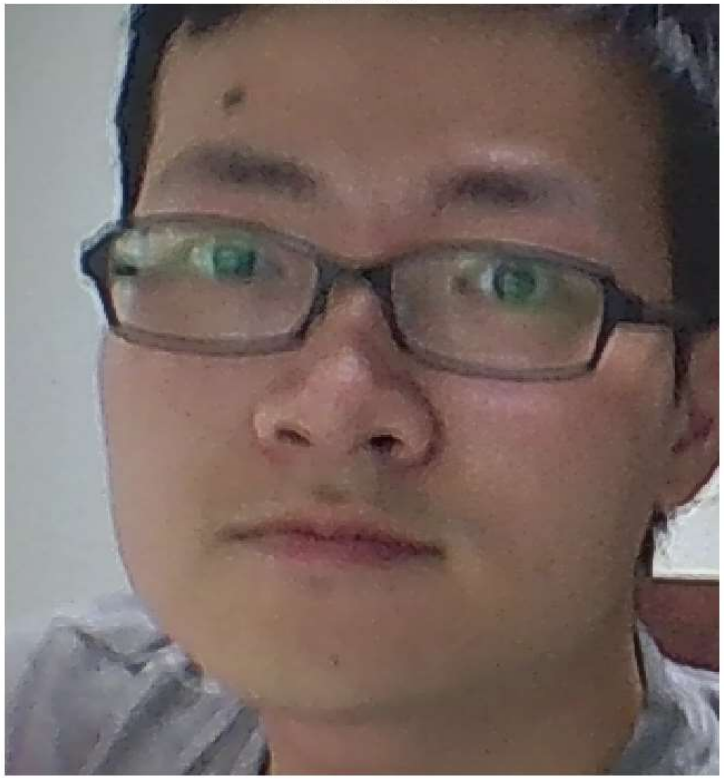
Surprised

Sad



Disgusted

Original face



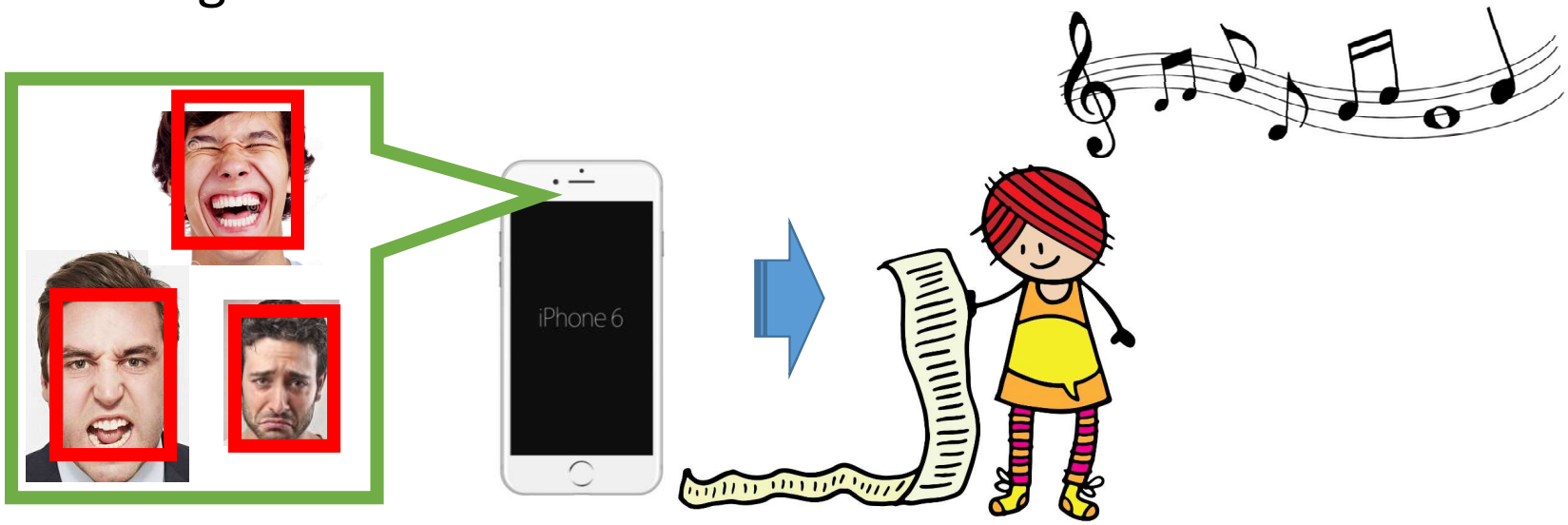
Preprocessing image

Reference

- https://i.ytimg.com/vi/oCqGtM3yAig/maxresdefault.jpg
- http://blog.enjoycss.com/wp-content/uploads/2015/09/woman-making-list.jpg
- http://thumbs.dreamstime.com/z/happy-teenage-laugh-closeup-close-up-portrait-loudly-laughing-young-man-isolated-white-background-35325424.jpg
- http://i.dailymail.co.uk/i/pix/2014/08/29/1409331226296_Image_galleryImage_17_Jan_2013_Businessman_y.JPG
- https://blog.udemy.com/wp-content/uploads/2014/05/bigstock-Portrait-of-a-sad-man-41540233-300x234.jpg
- http://www.thetailgatetimes.com/wp-content/uploads/2016/02/Curry-and-Lebron-James.jpg
- http://core0.staticworld.net/images/article/2012/10/v5-471p20win820left20facin-100008105-orig.jpg
- http://wrightrobinson.co.uk/wp-content/uploads/2014/01/music_notes_stock_by_bassgeisha-d3h9mpv.jpg

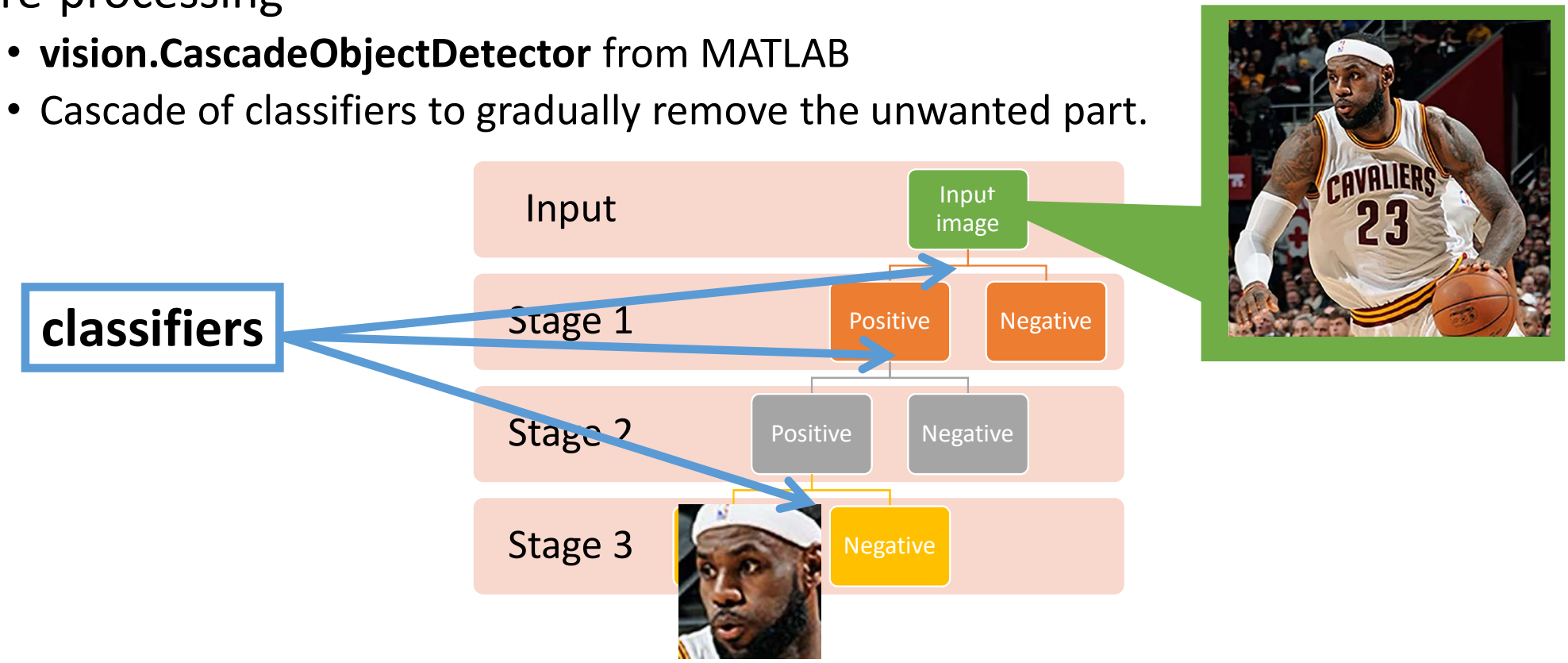
Our vision architecture (Backup)

- Step1: Read faces through camera.
- Step2: Processing the face images and classify mood label.
- Step3: Output a song list for users.



Proposed methods(cont.) (Backup)

- Pre-processing
  - **vision.CascadeObjectDetector** from MATLAB
  - Cascade of classifiers to gradually remove the unwanted part.



Proposed methods (cont.) (Backup)

- Histogram of gradients (HOG)
  - Quantize the face image into gray level.
  - Partition the face image into small cells.
  - Compute gradients of each pixels in each small cells, then combine them into histogram of gradients.
  - Use the histogram of gradients as feature to train SVM model.