MasTagger

What's The Subject Person of This Photograph?

Demo ID 10 資工四
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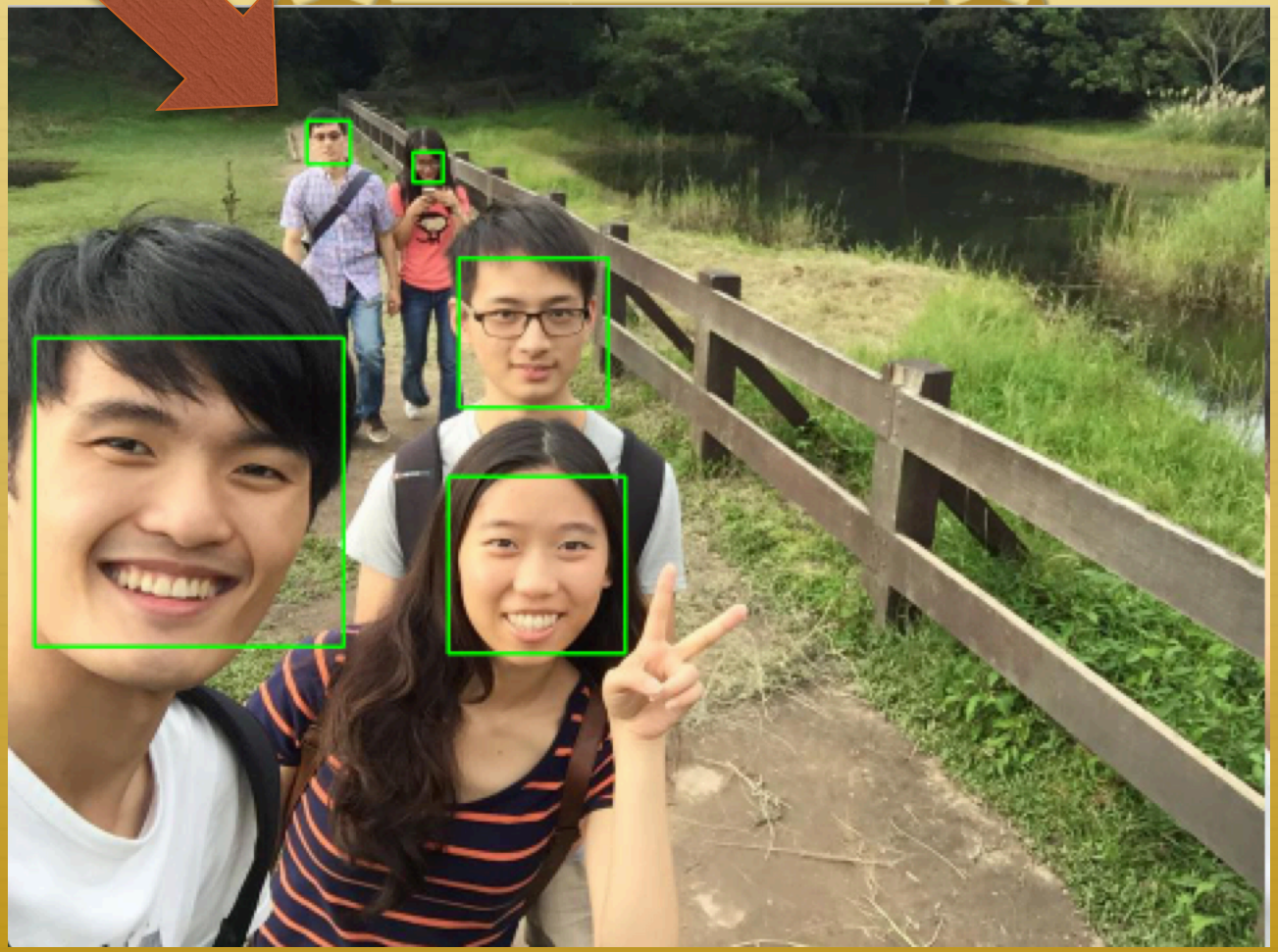
Github Repository

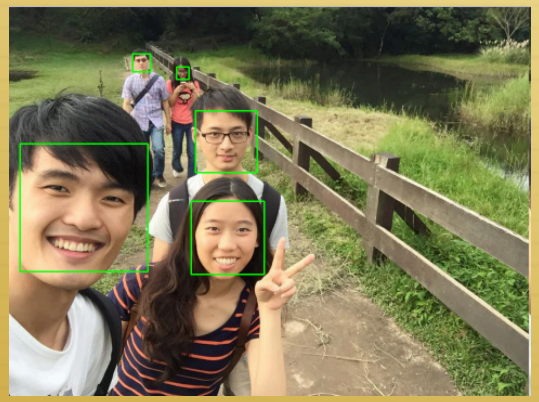
Non-Subject People

Motivation



Framework

Images with Face Detection



T/F/N

Semantic Tagging

Training Data

Global Features
+ Local Features

Feature Extraction

Machine Learning Model

SVM

Evaluation

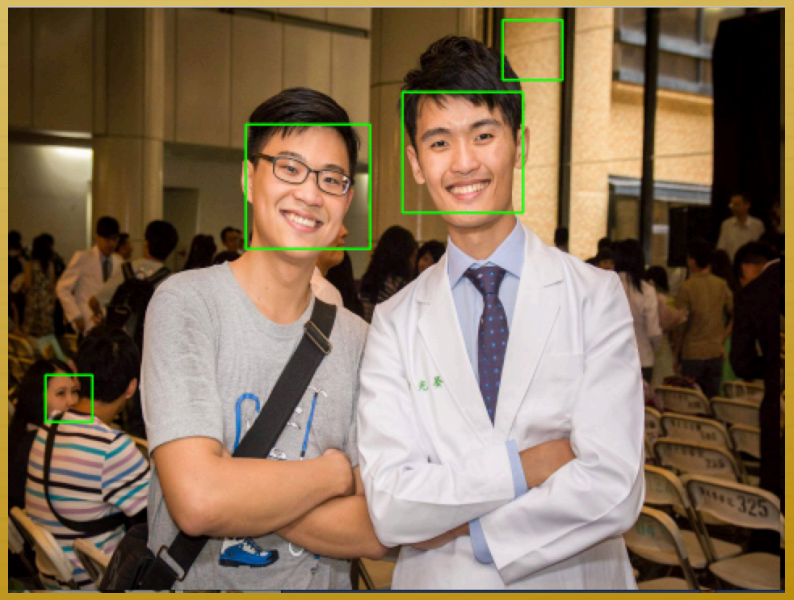
5-fold Cross-Validation

Testing Data

Application Use

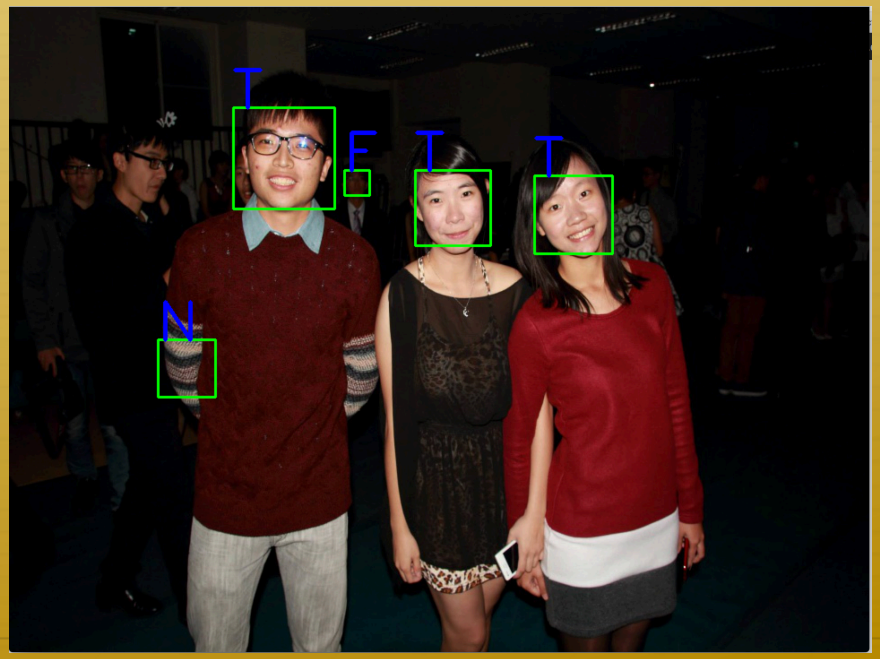
OpenCV Face Detection

- Use Haar-cascade Detection in OpenCV
- A widely used model: haarcascade_frontalface_alt2.xml
- But the model cannot tell the subject people between non-subject people
- Also, there are some non-human objects detected



Semantic Tagging

- Dataset : Crawl 2000 photos from Facebook
- We use the 290 cleaned photos with T and F for training
- Tag with 3 labels (within group consensus)
  - T : True Subject People
  - F : Non-Subject People
  - N : Non-Human Objects



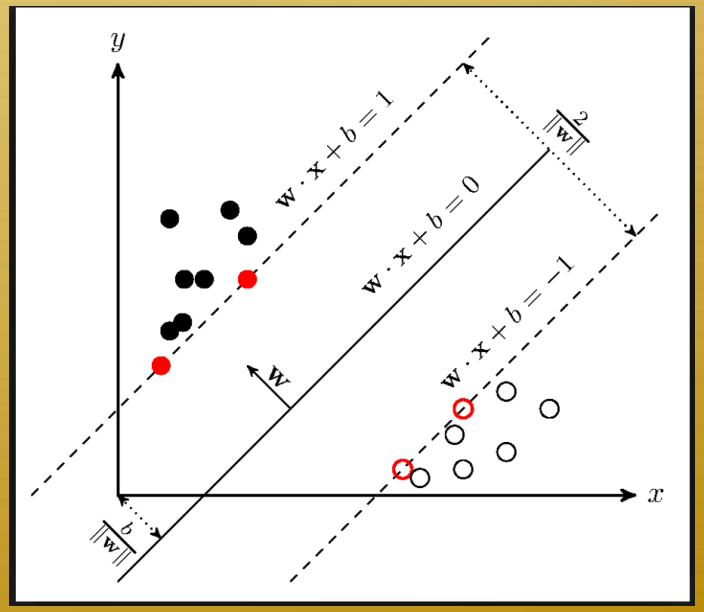
Feature Extraction

- Global Features : The feature of the whole photo
  - Color histograms
  - The mean and variance of (x, y) and (width, height) of all faces in this photo
  - Density (average distance of faces)
- Local Features : The feature of a face
  - (x, y) and (width, height) of this face
  - Number of faces with the circle (r = 0.4 width)
  - Centrality
  - Histograms

Machine Learning Model

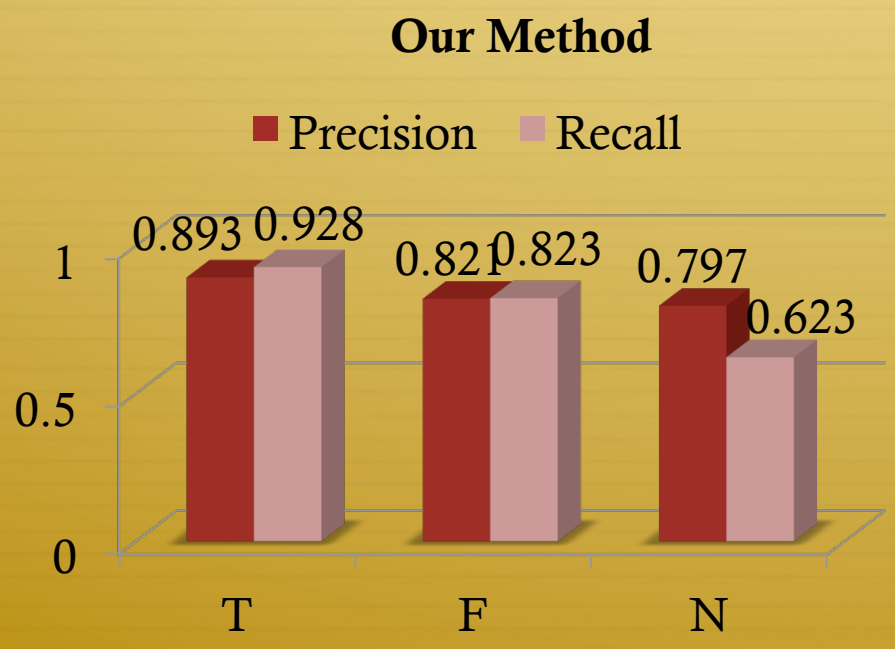
- Support Vector Machine (SVM) for the 3-class classification problem (One versus One)
- Radial basis function (RBF) kernel
- Gird Search, C = 10
- Each sample is re-weighted by

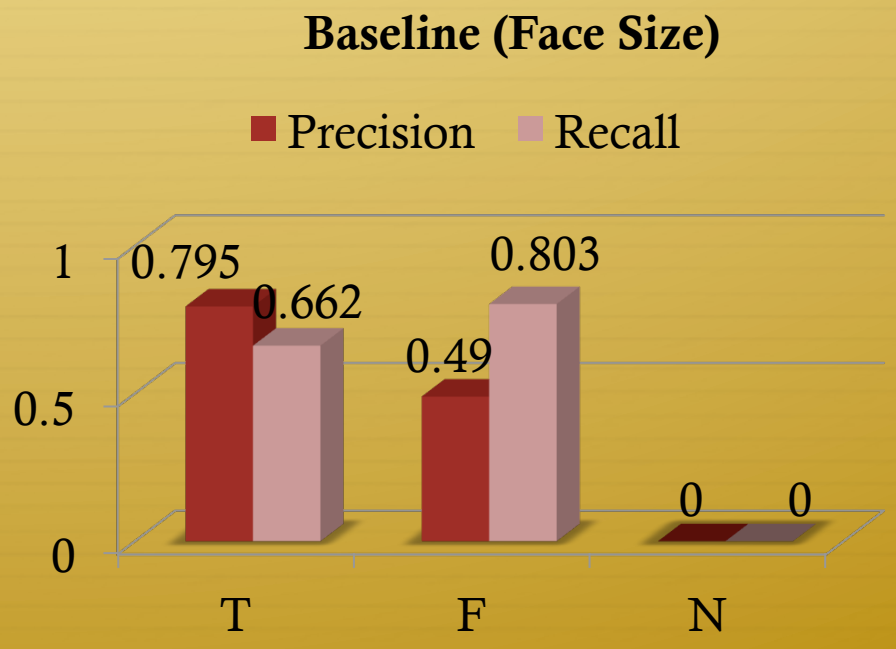
  1/#(faces in this image)



Evaluation
5 fold cross-validation

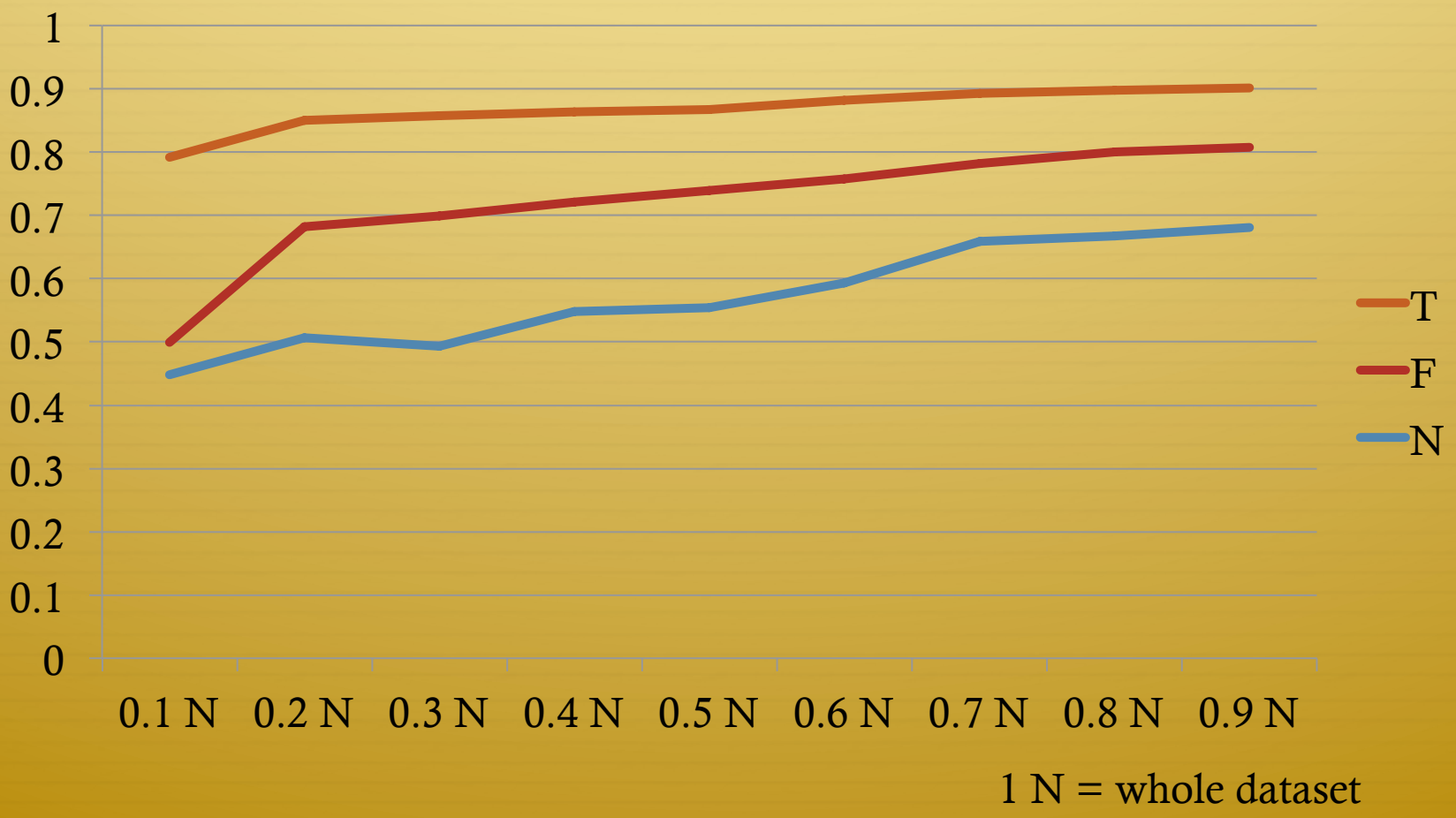
- (Precision / Recall), weighted by 1/#(faces in this image)





(#T : #F : #N) = (23 : 9 : 4)

Evaluation – F1 Score Convergence



1 N = whole dataset

Demo (Static)

Before

After

Demo (Static)

Before

After

Demo (Static)

Before

After

Demo (Static)

Before

After

Real Time Camera !!!

Future Work

- Add some better profile face detector
- Apply our model on mobile phones

Questions?