Photo Classification

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Outline

Goal

In/Outdoor

Building

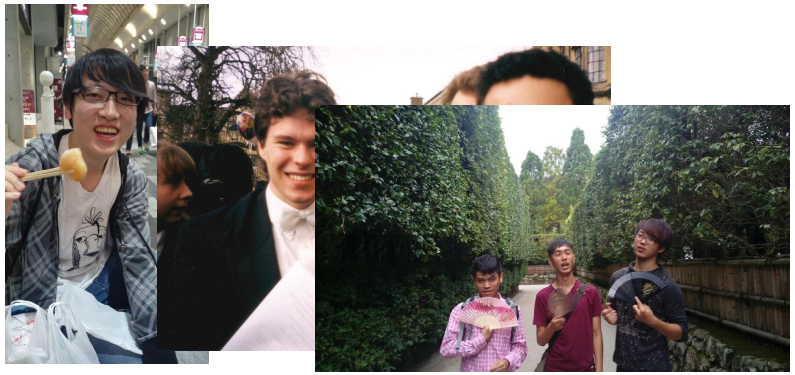
People

Evaluation

Demo

Goal

Simple, fast photo classification for mobile devices.



Method

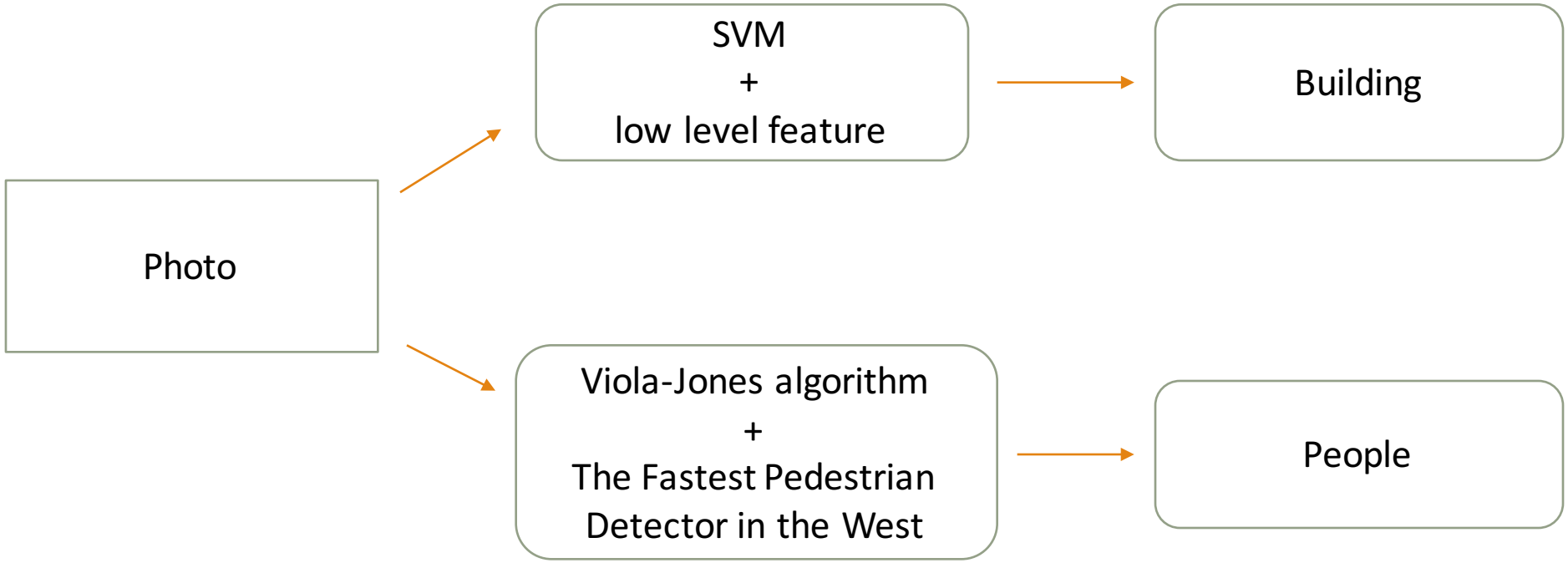


Photo
SVM
+
low level feature
Building
Viola-Jones algorithm
+
The Fastest Pedestrian
Detector in the West
People

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InOutDoor

- Using **EXIF** information to detect

- We extract following info as features

  ExposureTime

  FNumber

  ISOSpeedRatings

  ShutterSpeedValue

  ApertureValue

  BrightnessValue

  ExposureBiasValue

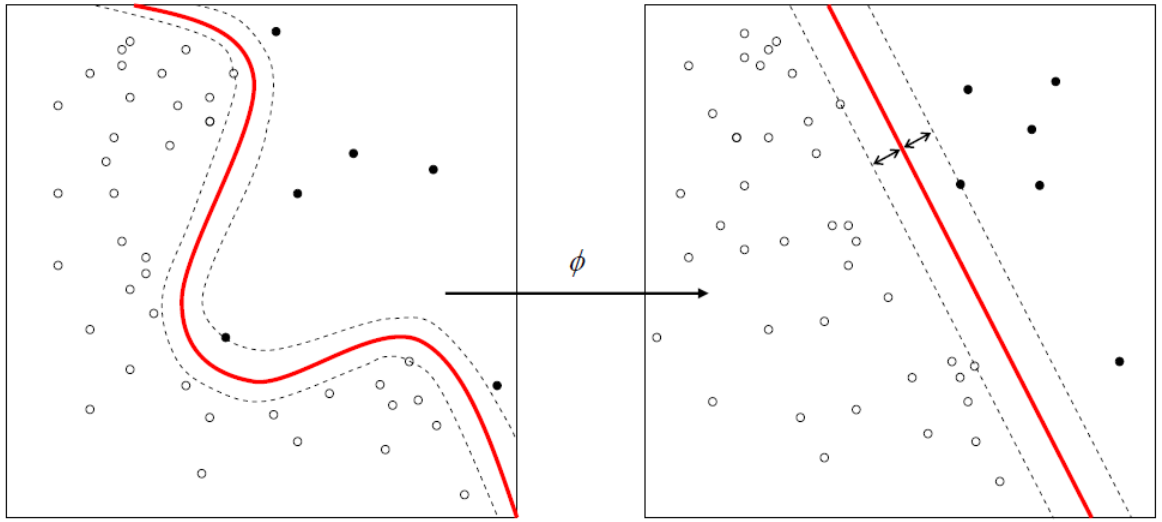
  MaxApertureValue

  FocalLength

Tag-ID hex.	Tag-Name	Tag-Bedeutung
9000	ExifVersion	Version des Exif-Standards
010F	Make	Name des Kameraherstellers
0110	Model	Name des Kamera-Modells
0112	Orientation	Bild-Ausrichtung Hochformat / Querformat
9003	DateTimeOriginal	Aufnahmedatum
829D	FNumber	Blendenzahl
829A	ExposureTime	Belichtungszeit
8833	ISOSpeed	Empfindlichkeit des Bildsensors
9207	MeteringMode	Belichtungsmessverfahren Mittelwert/Spot/Multisegment
013B	Artist	Ersteller/Photograph
8298	Copyright	Urheberrechts-Information
9286	UserComment	Allgemeiner Kommentar oder Bildbeschreibung. Unicode-fähig.
010e	ImageDescription	Titel des Bildes und kurze Bildbeschreibung.

InOutDoor

- By SVM (using rbf kernel) to train a model
- Using model to predict the new one.
- Training data set is too small



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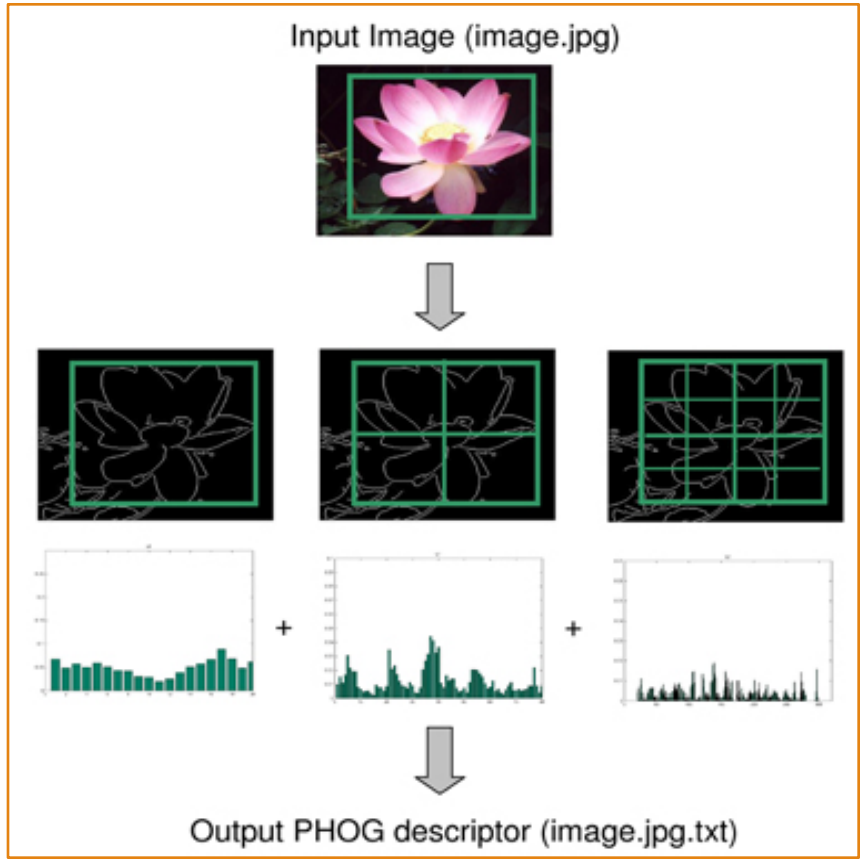
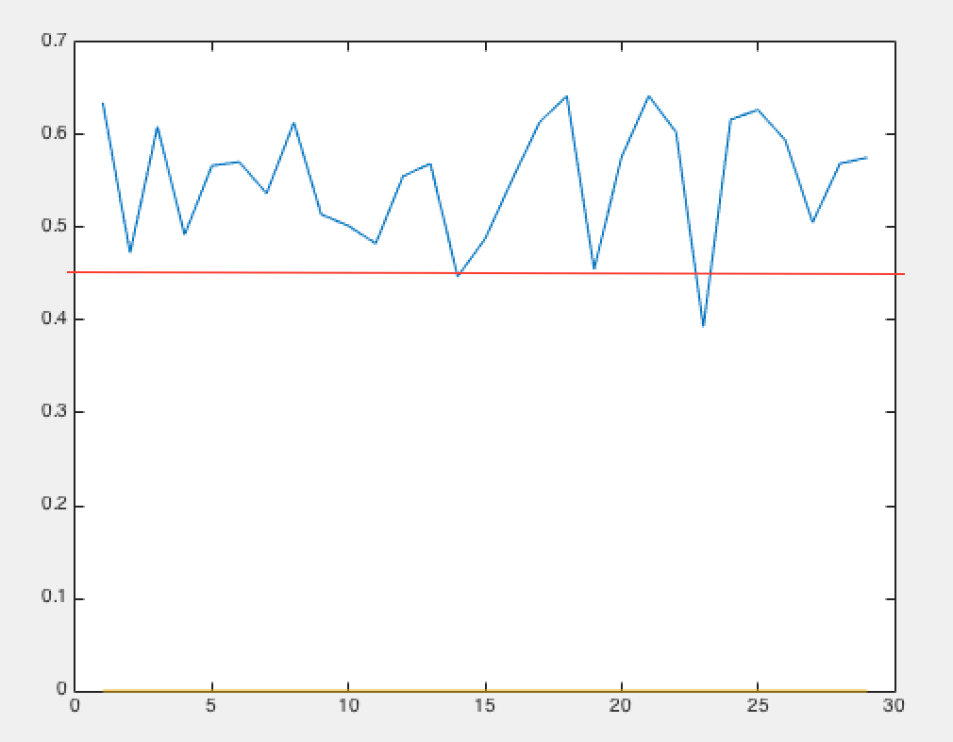
Building detection

- Using PHOG to detect each pictures` edge orientation
- Can pair with InOutDoor



Observation

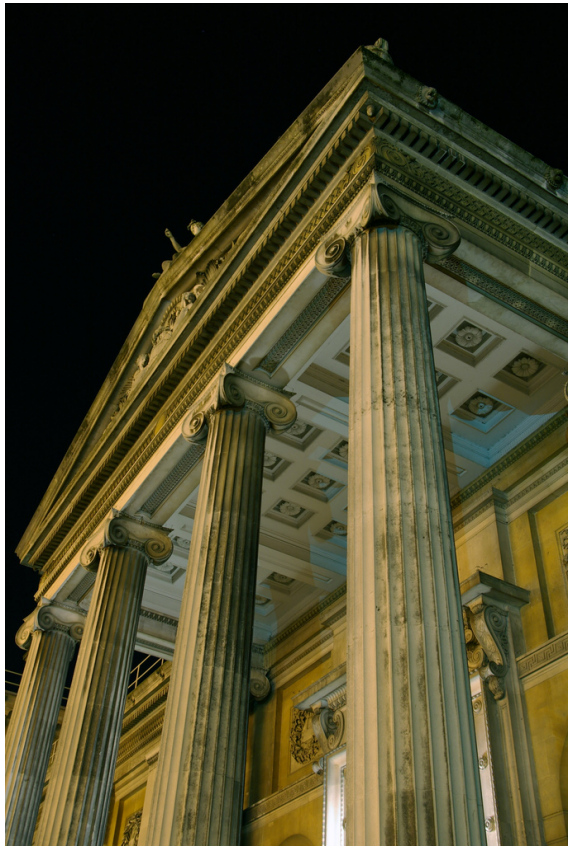
- building`s orientation will have great proportion in 0~10 80~100 170~180
- mean of Buildings` proportion over 45% mean of others` less than 45%
- therefore we use 45% as threshold



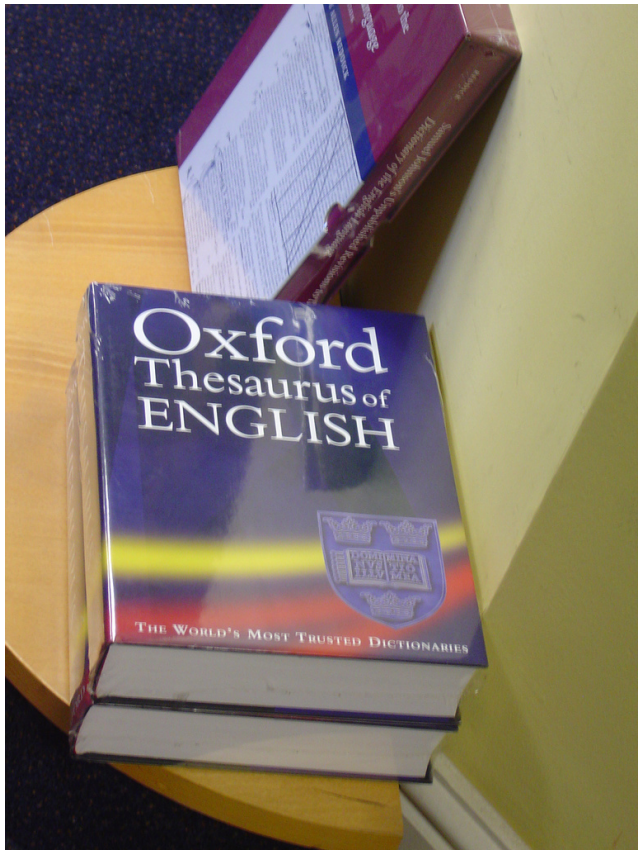
The Problem We Face

- Not all Building picture was taken in front
- The one which have many Horizontal / vertical edge
- The Building was blocked by other things, like people, tree, and so on
- The fake one

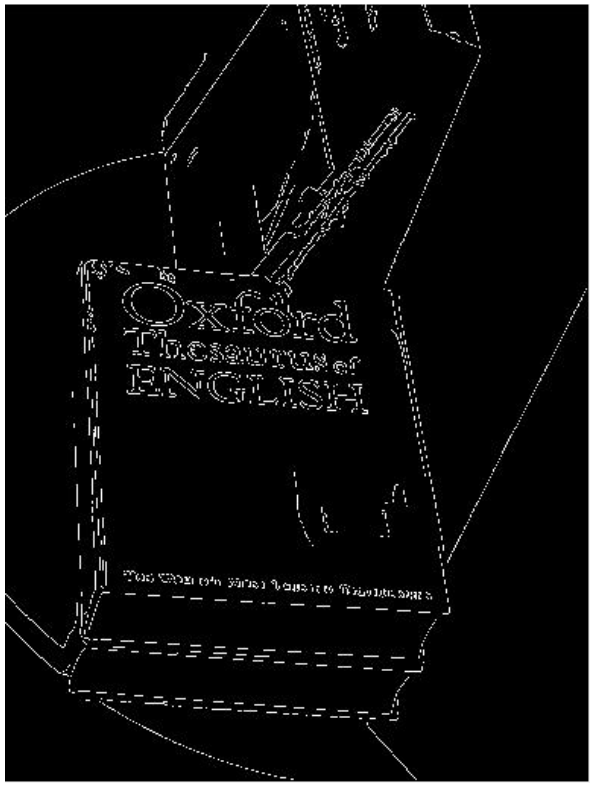
The Problem We Face (Not taken in front)

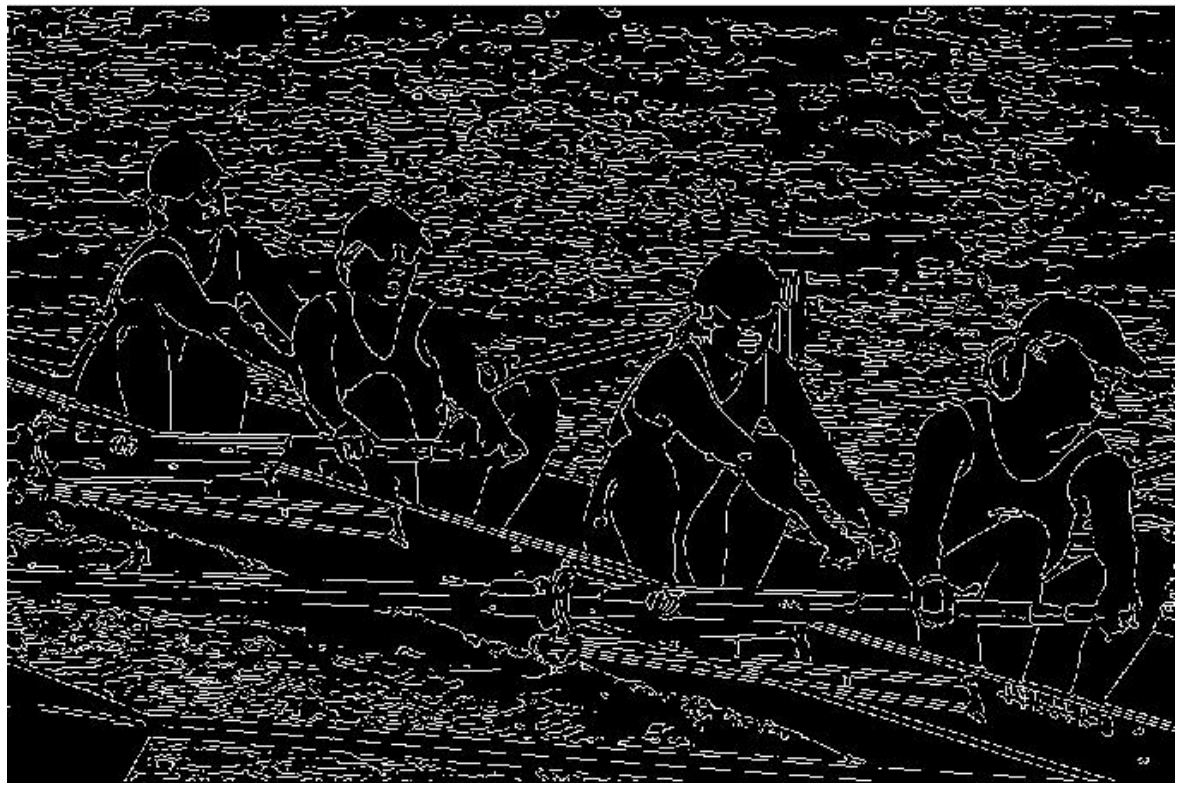


The Problem We Face (many Horizontal / vertical edge)



The Problem We Face (many Horizontal / vertical edge)

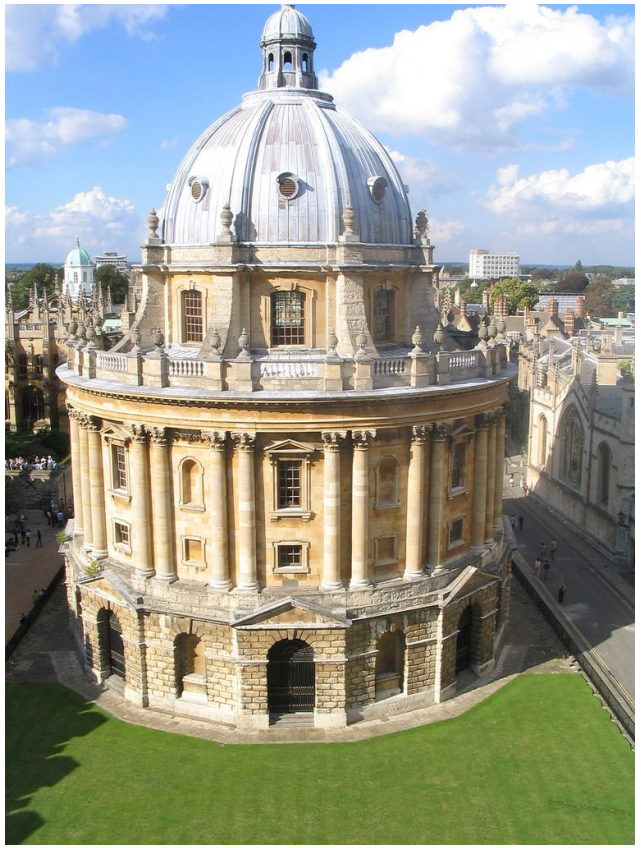




The Problem We Face (Blocked)

The Problem We Face (The Fake one)

Good Result



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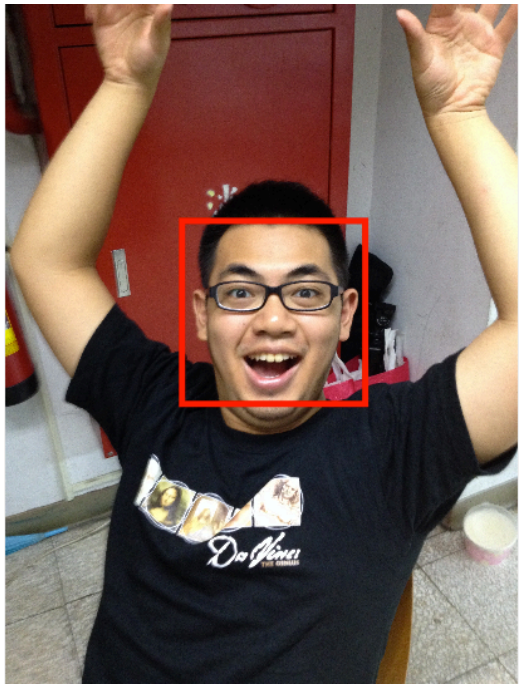
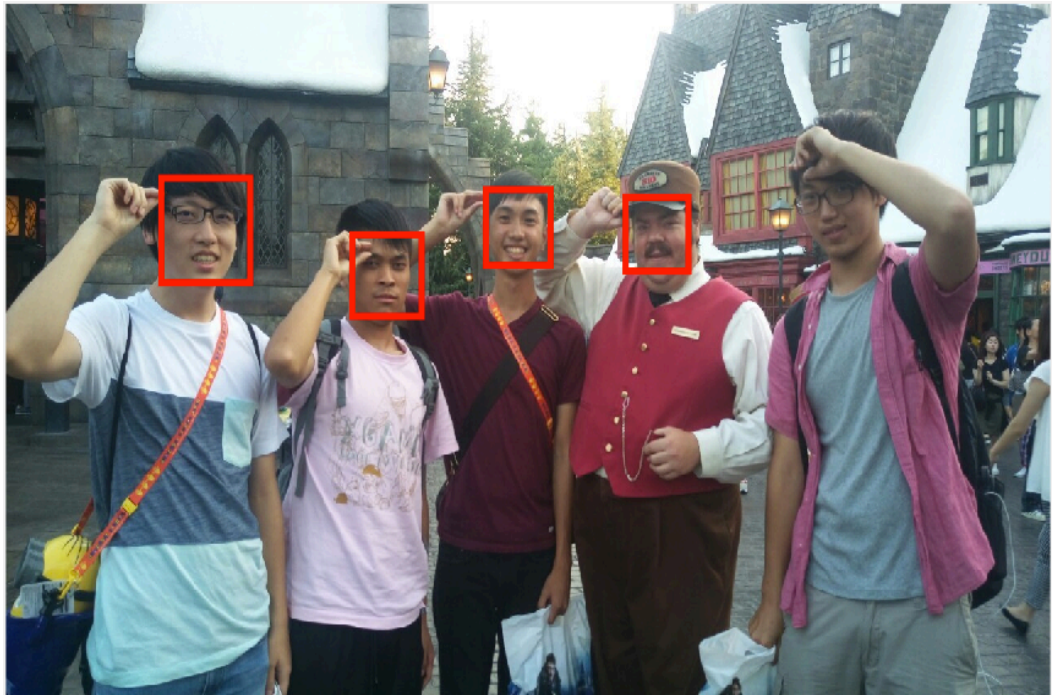
Findings

Set the threshold of the size of smallest detectable object to filter out some false detection

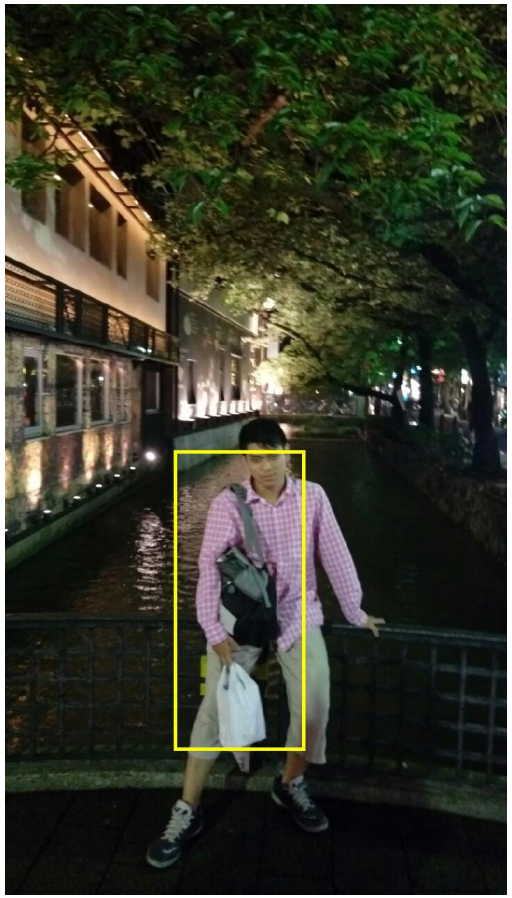
Pedestrian detection is too sensitive to the environment, even if the threshold is set

Viola-Jones algorithm

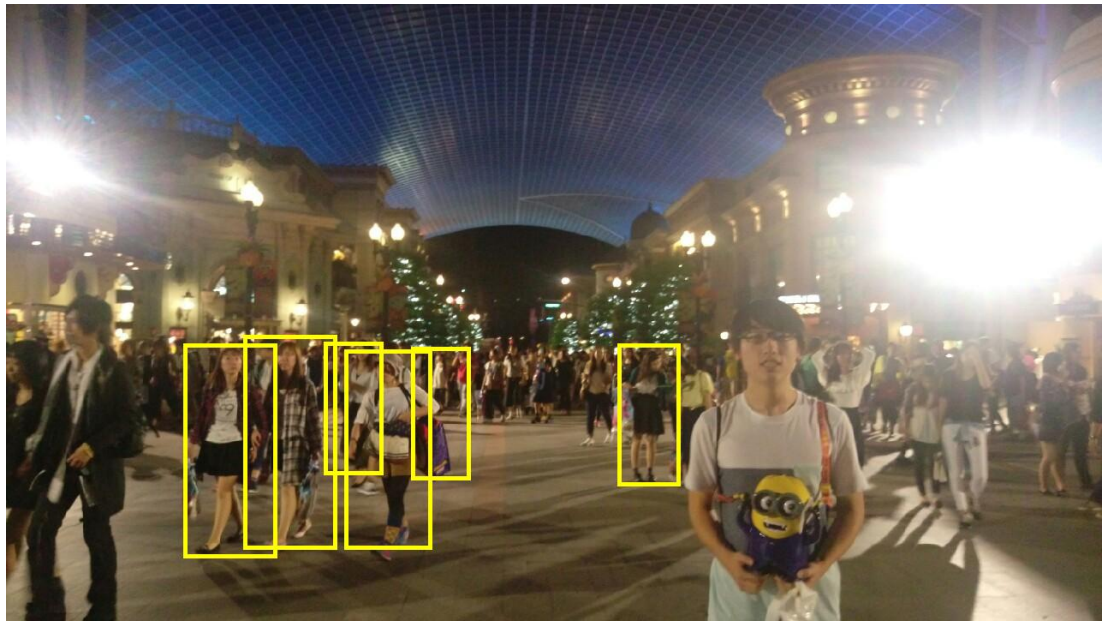




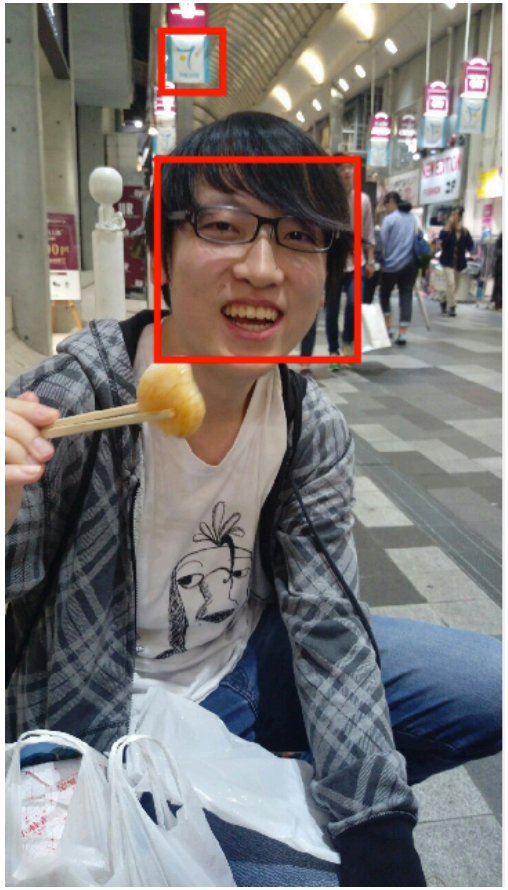
The Fastest Pedestrian Detector in the West



Bad Example



Compare two methods



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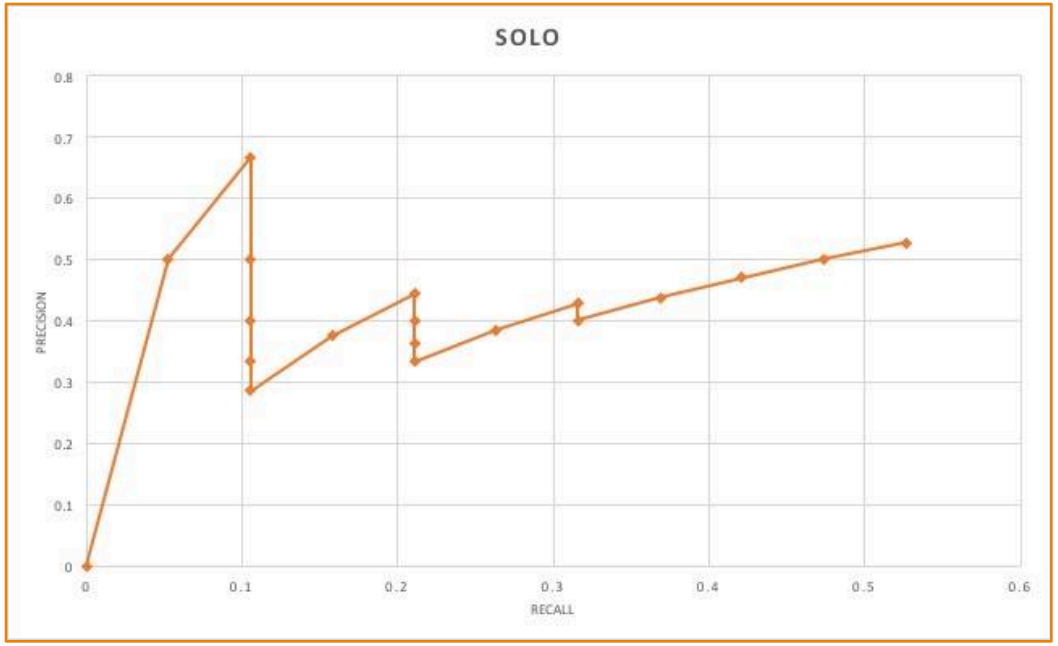
Evaluation (accuracy)

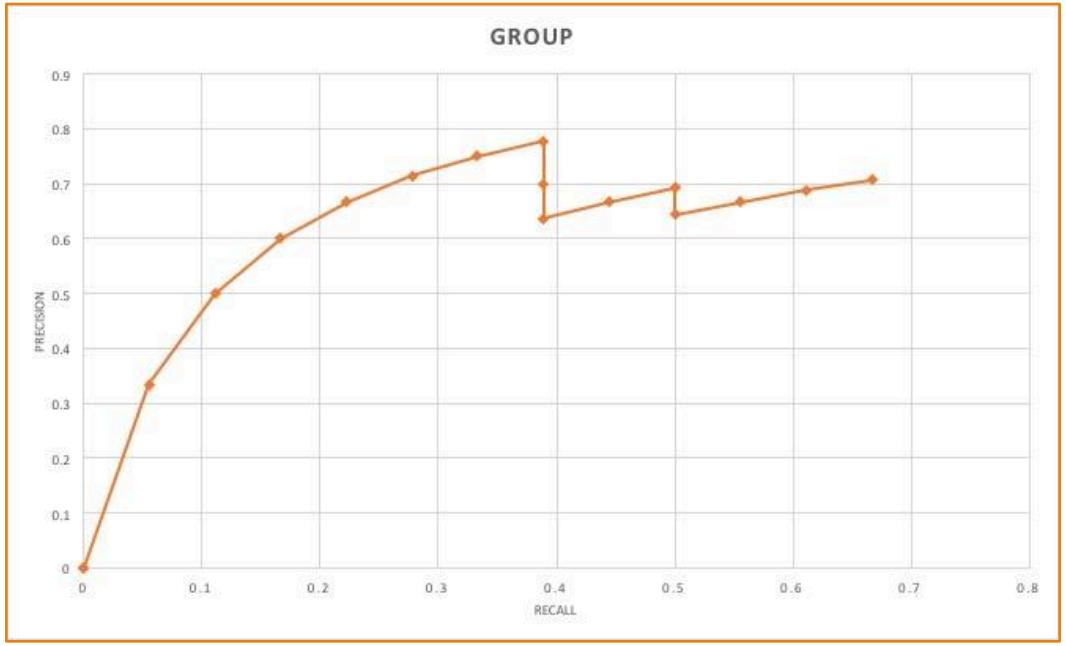
Building : 81.63 %

People : 65.15 %

Evaluation(Building)

Evaluation(People)





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Q & A

Thanks for listening