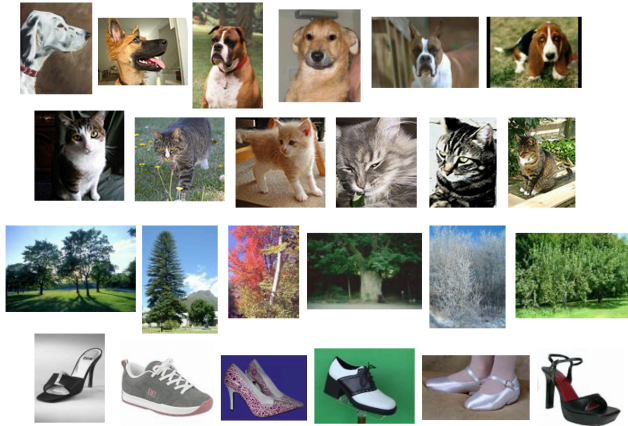


Object recognition – why is it difficult?



1

The recognition of faces

2

Why is face analysis important?

- Remember/recognize people we've seen before
- Categorization – e.g. gender, race, age, kinship
- Social communication – emotions/mood, intentions, trustworthiness, competence or intelligence, attractiveness
- Scene understanding, e.g. direction of gaze suggests focus of attention



3

Why is face recognition hard?

4

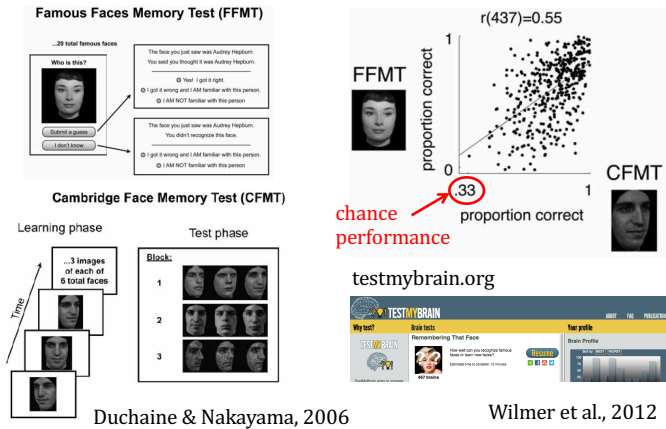
How good are we at face recognition?



Jenkins, White, Van Montfort & Burton, *Cognition*, 2011

5

Face recognition performance in humans



6

Face recognition performance in humans

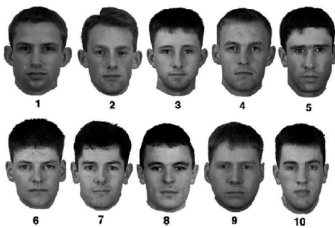


Which of the 10 photos on the bottom depicts the target face?

Viewers are ~ 70% correct

Performance degrades with changes in pose, expression

Only slight improvement with short video clip of target



Importance of familiar vs. unfamiliar face recognition!

Bruce et al., 1999

7

How good are the best machines?

Public databases of face images serve as benchmarks:

Labeled Faces in the Wild (LFW, <http://vis-www.cs.umass.edu/lfw>) > 13,000 images of celebrities, 5,749 different identities

YouTube Faces Database (YTF, <http://www.cs.tau.ac.il/~wolf/ytfaces>) 3,425 videos, 1,595 different identities

Private face image datasets:

(Facebook) Social Face Classification dataset 4.4 million face photos, 4,030 different identities

(Google) 100-200 million face images, ~ 8 million different identities

	LFW	YTF
Facebook DeepFace	97.4%	91.4%
Google FaceNet	99.6%	95.1%
Human performance	97.5%	89.7%



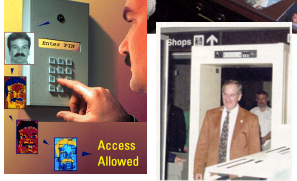
8

Machine vision applications of face recognition

security, forensics



access control



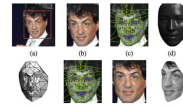
surveillance



9

More applications of face recognition

Facebook's New Face-Recognition Software Is Scary Good



Google Glass Face Recognition App Coming This Month, Whether Google Likes It Or Not



Facial recognition app matches strangers to online profiles



social media & content-based image retrieval



How to block Facebook and Google from identifying your face

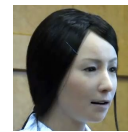
PUBLISHED WED, JAN 22 2020-3:37 PM EST | UPDATED WED, JAN 22 2020-4:48 PM EST



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SHARE f t in e



graphics, HCI
humanoid robots

10

Aspects of face processing

Face detection – find image regions that contain faces

Face identification – who is the person?

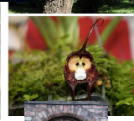
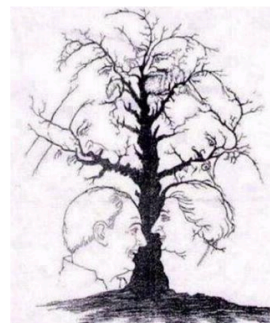
Categorization – gender, age, race

Facial expression – mood, emotion

Non-verbal social perception and communication

11

Faces everywhere...



12