Who is There?  
Video Surveillance & Face Recognition

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~30M surveillance cameras in the United States
Face Recognition

Probe          Gallery

How to compute the similarity between two faces?
Boston Marathon Bombing Suspects

Tamerlan Tsarnaev

Dzhokhar Tsarnaev

April, 2013
Search For Dzhokhar Tsarnaev

Who is this?

Law Enforcement

Who is this?

Gallery (80 million faces)

Search System

One of them?

Forensic expert

Search For Tammy Among 120 Million Faces
How Does Face Recognition Work?
Face Detection
Landmark Detection
Image Normalization
Feature Extraction
Comparison

Distance = 7
Same Person Comparison

Distance = 1
Faces in a Crowd
Pose Variations

Images of one subject in NIST IJB-A data, overlaid with V-J detector & dlib landmarks
Face Search in Action

Gallery: 34 million (30M DMV photos, 4M mugshots) 2009 driver license photo
Face Search in Action

Top-10 retrievals

Gallery: 34 million (30M DMV photos, 4M mugshots)
Summary

- Cameras are everywhere: mobile phones to surveillance systems
- Need to determine who is in the image and what they are doing
- Automatic face recognition is difficult: pose, illumination, expression, aging
- ~99% accuracy for cooperative subjects with face captured in controlled conditions
- 1.5 million face comparisons/sec/core
ARE YOU WILLING TO TRADE CIVIL LIBERTIES FOR GREATER SECURITY?

Poll

THAT DEPENDS ON THE EXCHANGE RATE.
Privacy Concerns

Will surveillance cameras be used
- to track people?
- only for the intended purpose?
- to link multiple databases? *(function creep)*