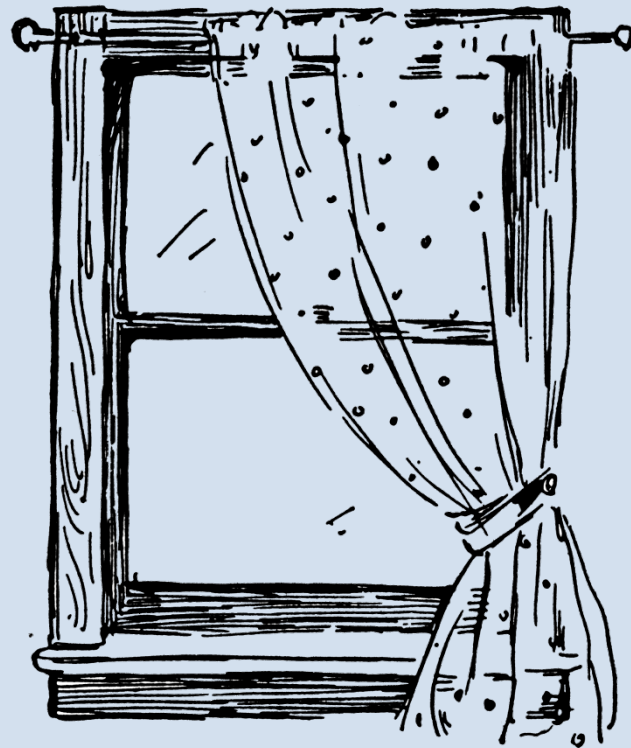


# Face tracking for the Watching Window

Masha  
Mikhisor



# Watching Window concept



Watching Window prototype video



2004



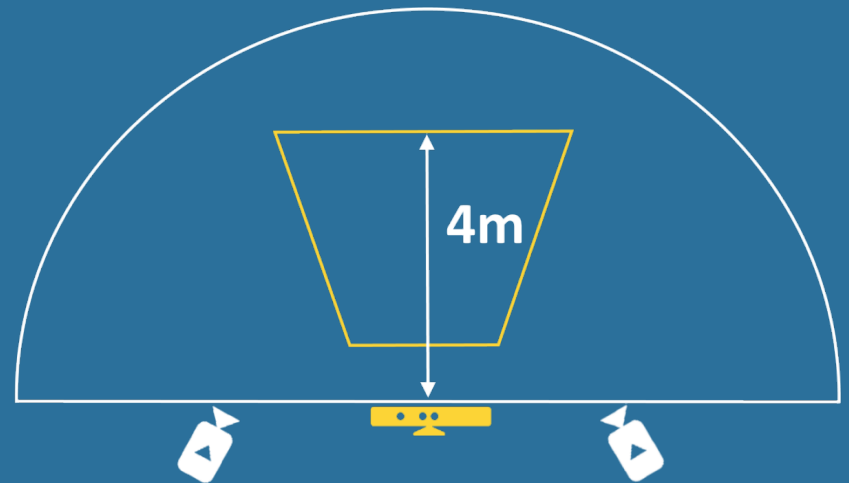


2004

Is the problem solved  
already?

# Problem statement

- **Large operating zone**
  - No extra devices
  - Fast
  - Long term
  - Other faces and dynamic background



# Problem statement

- Large operating zone
- **No extra devices**
- Fast
- Long term
- Other faces and dynamic background





# Problem statement

- Large operating zone
- No extra devices
- **Fast**
- Long term
- Other faces and dynamic background

**30 fps**



# Problem statement

- Large operating zone
- No extra devices
- Fast
- **Long term**
- Other faces and dynamic background



# Problem statement

- Large operating zone
- No extra devices
- Fast
- Long term
- Other faces and dynamic background



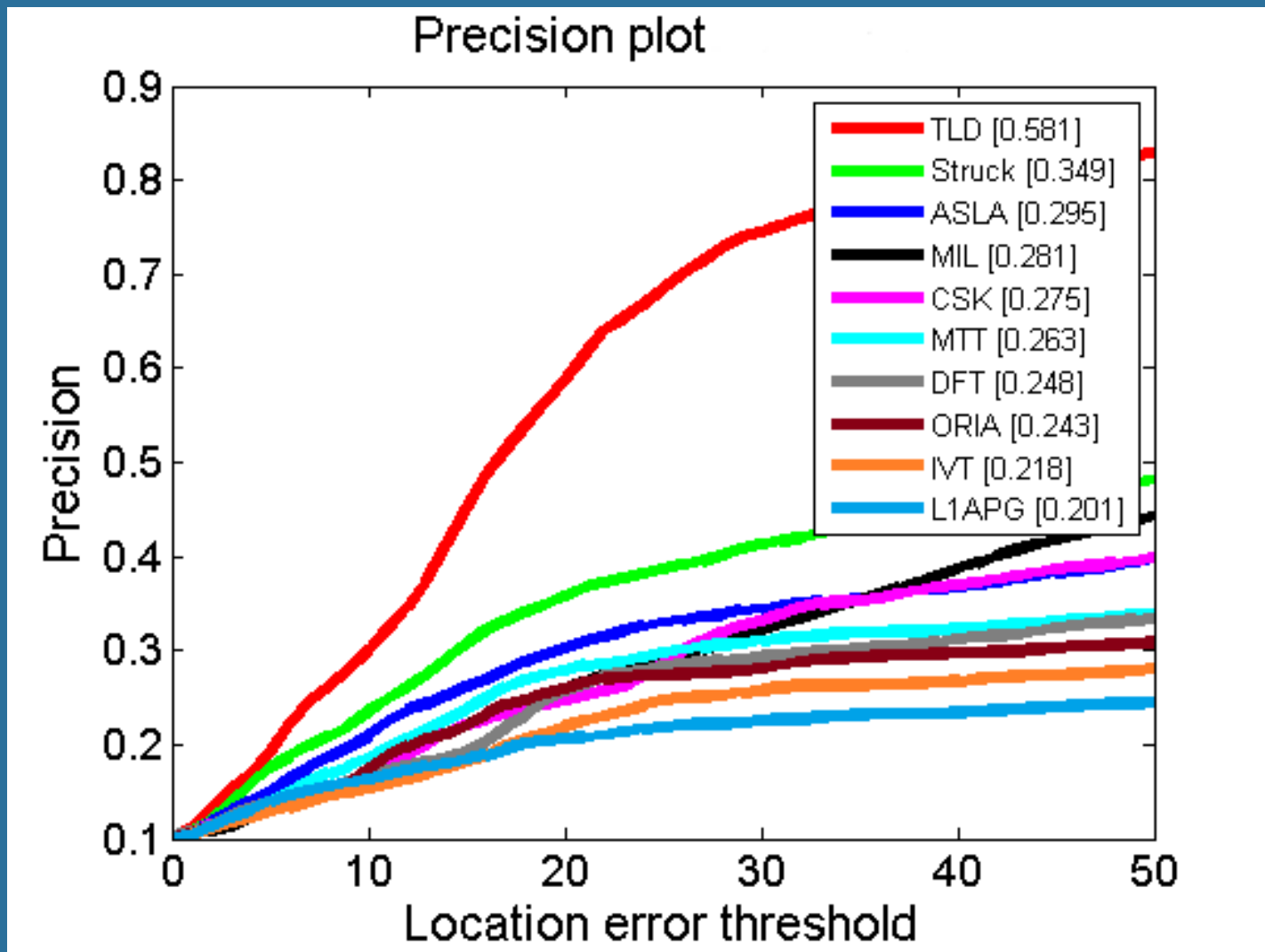
# Different tracking Techniques - how to choose?

discriminative model  
Support Vector Machines  
Markov Chain Monte Carlo  
local optimum search sparse PCA  
binary pattern holistic representation  
principal component analysis generative model  
template  
local search  
Appearance Modeling  
dense sampling search  
intensity histogram  
particle filter sparse representation  
Covariance Tracking

A video with an experiment with several different  
trackers



# Different tracking algorithms





FaceTLD

Short term  
tracker

Adaptive face  
detector

# Adapting for face tracking

Face  
detector



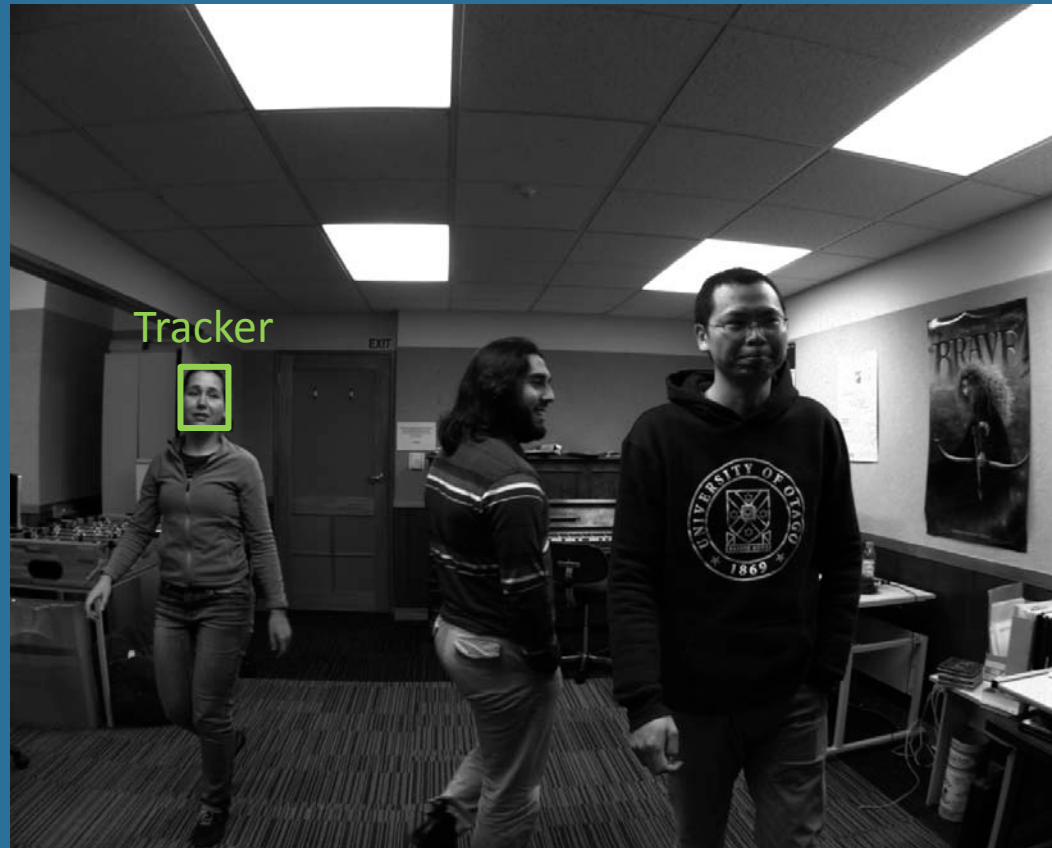
Nearest Neighbor  
Classifier



Positive  
examples

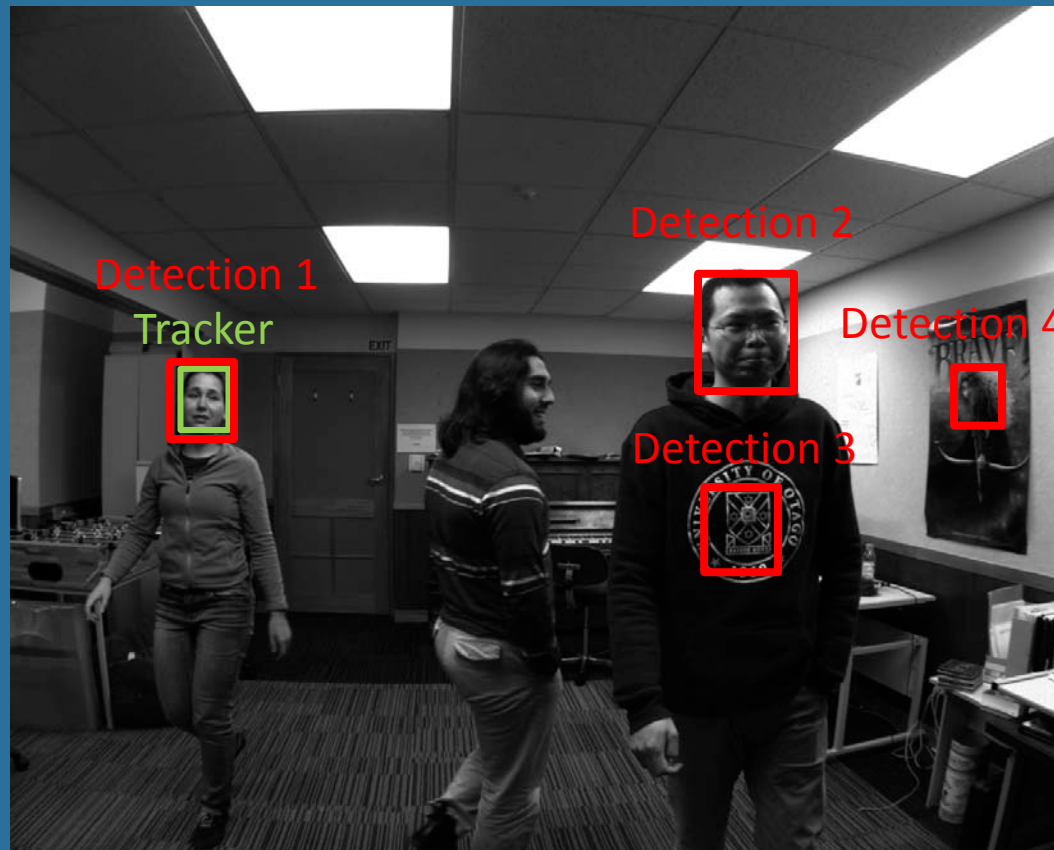


Negative  
examples

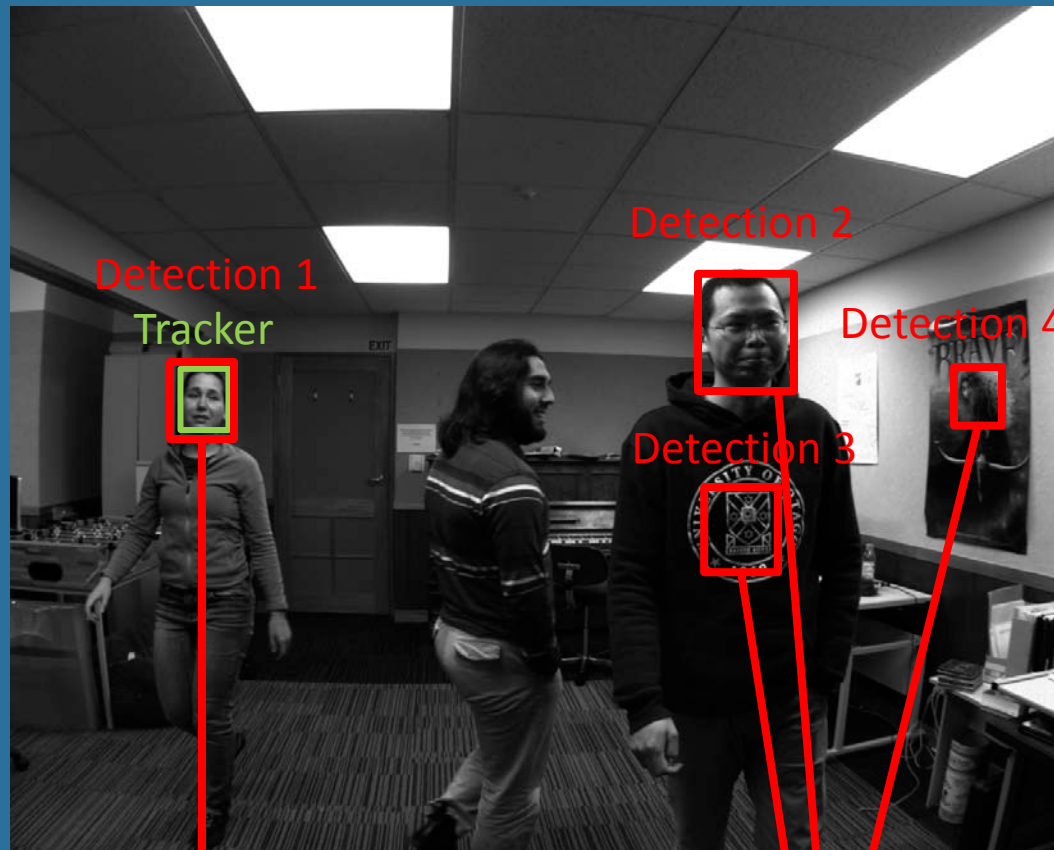


- Tracking





- Tracking
- Detection



- Tracking
- Detection
- Learning

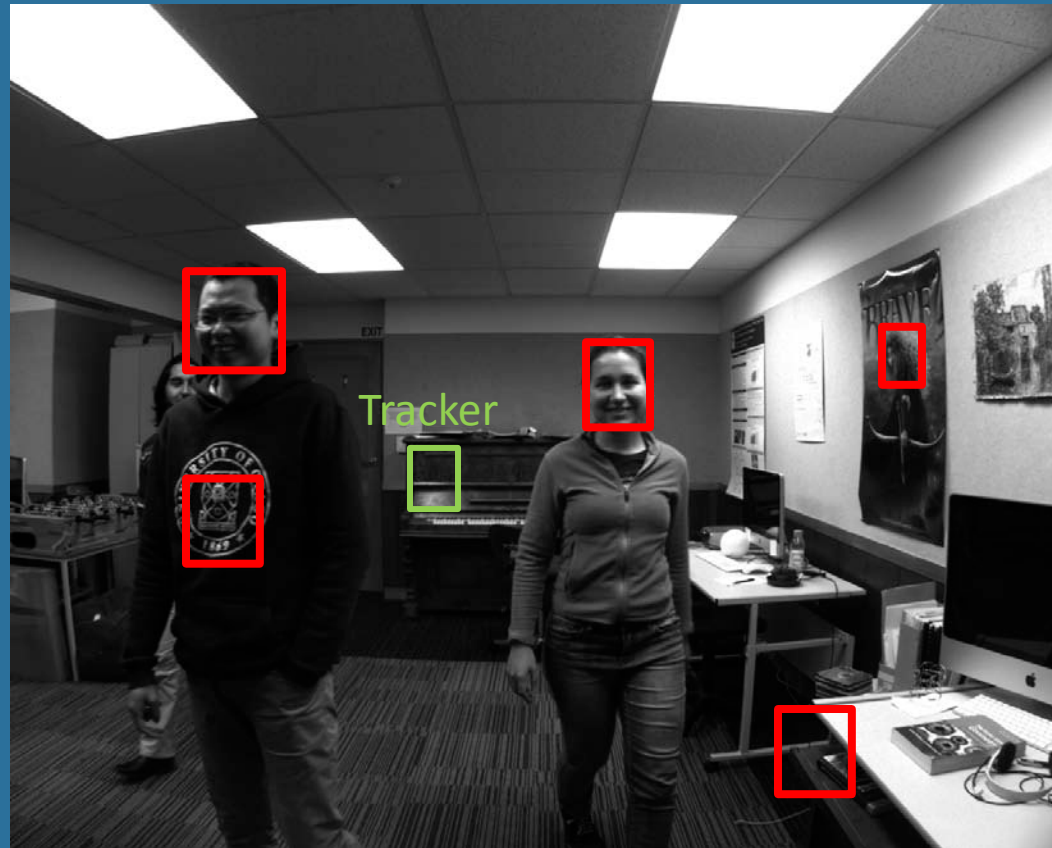
Positive  
examples

Negative  
examples

Several frames later...

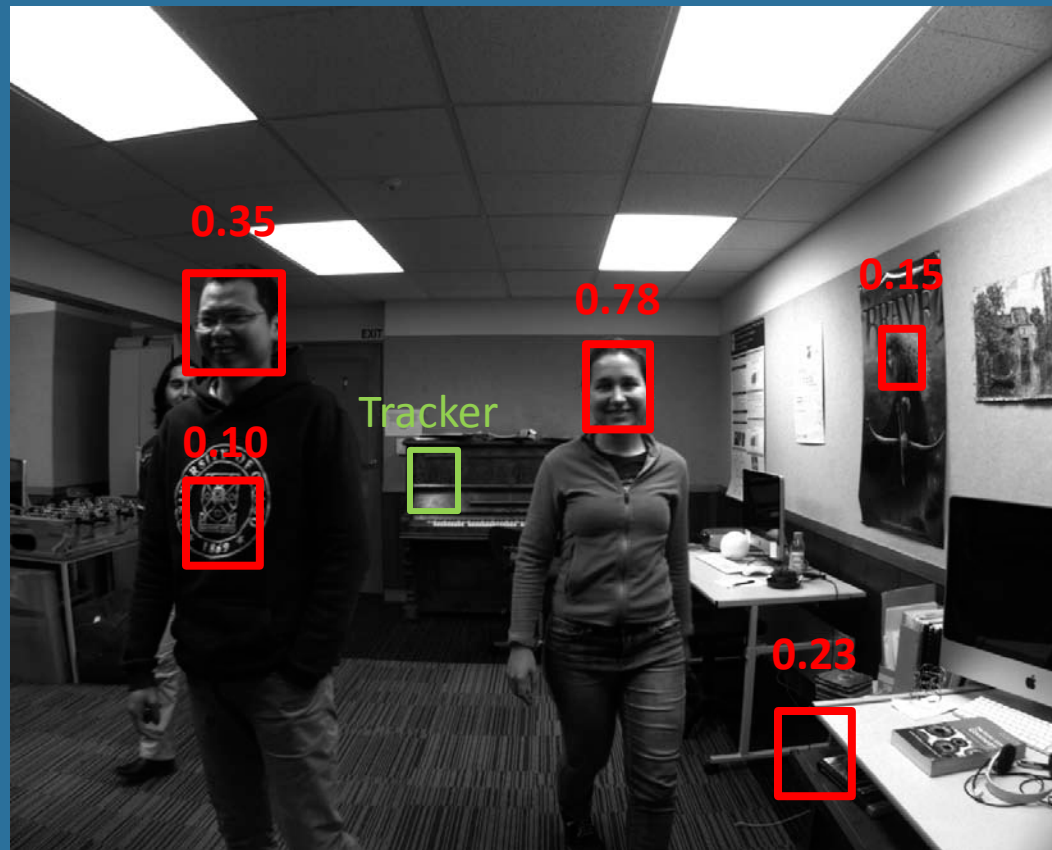


- Tracking

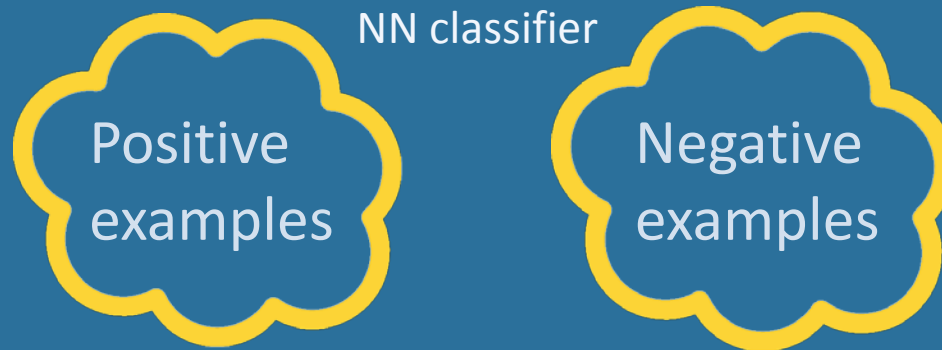


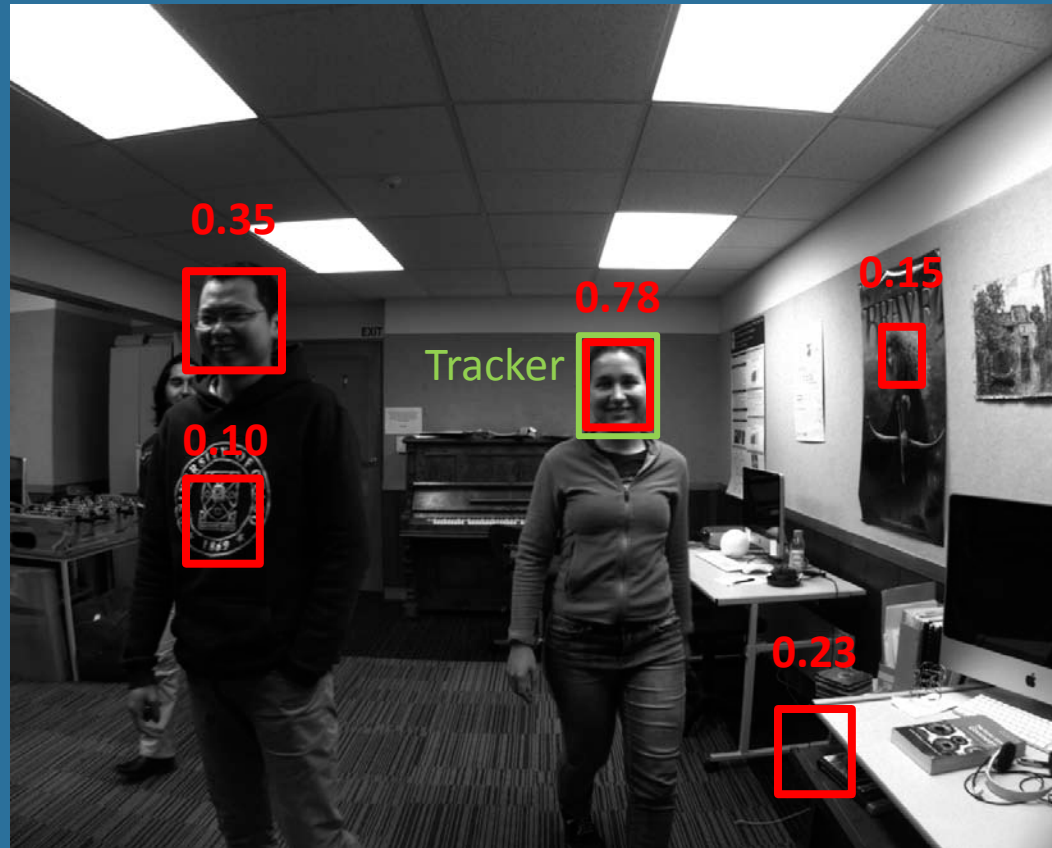
- Tracking
- Detection





- Tracking
- Detection
- Evaluation

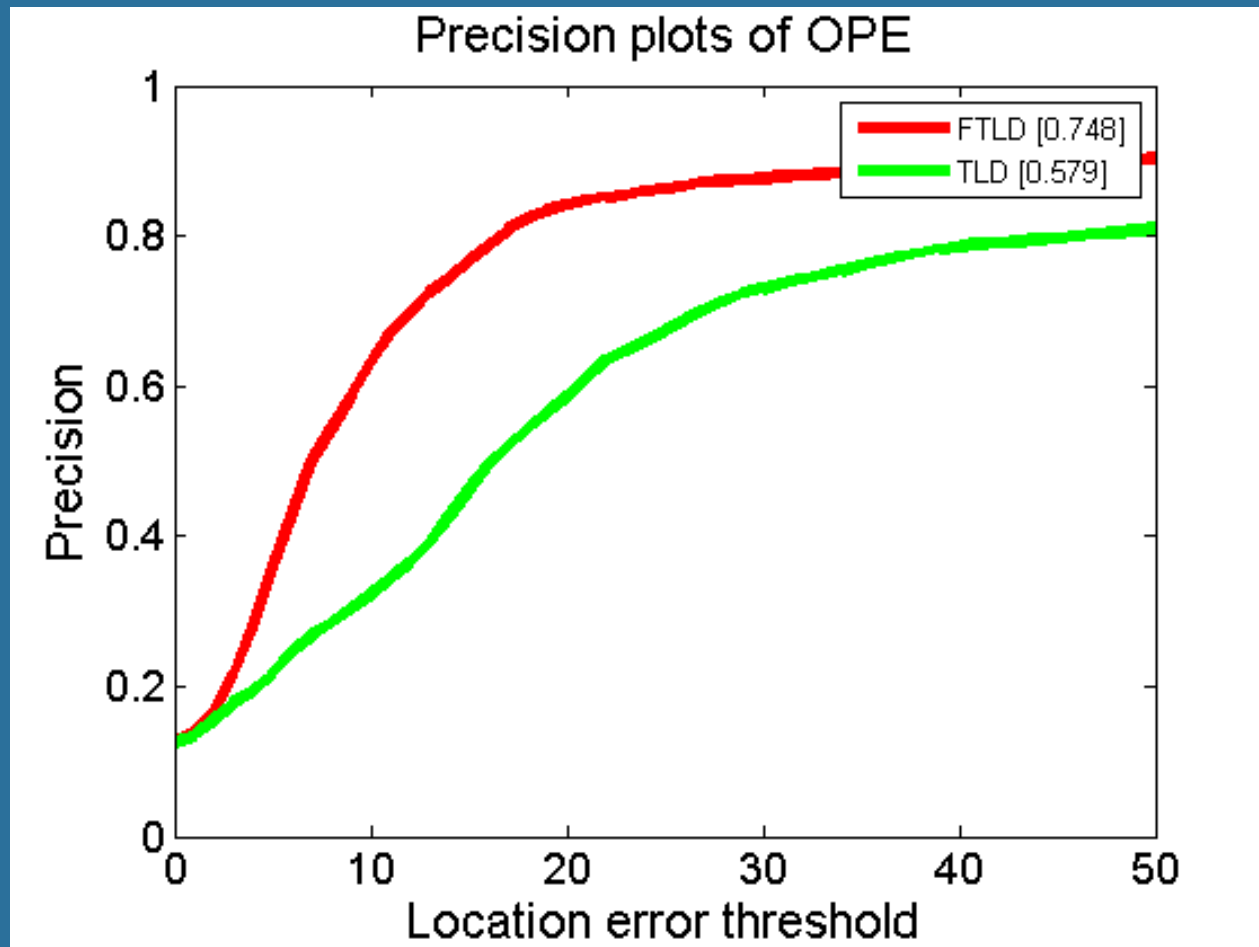




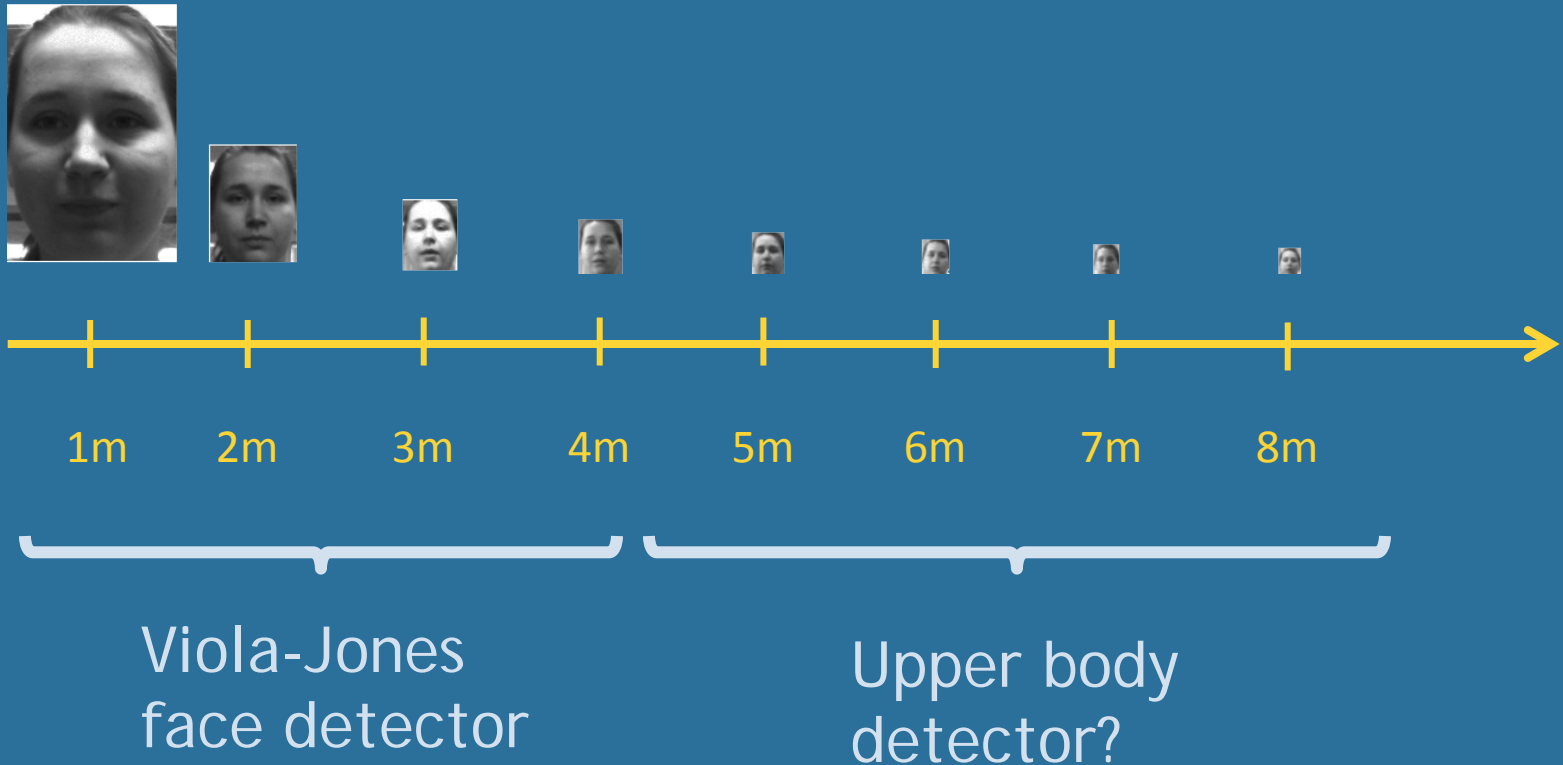
- Tracking
- Detection
- Evaluation
- Reinitialization

# Adapting for face tracking

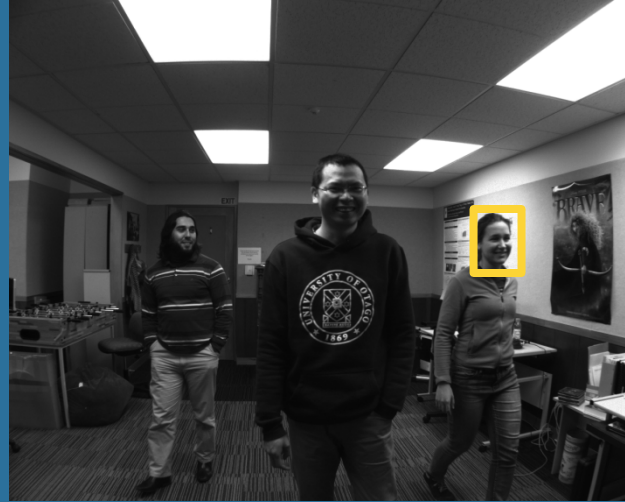
## OpenTLD VS FaceTLD



# Large distance reinitialization



# Future work: Adapting for stereo





Future work:  
speeding up



Future work:  
testing user experience



A video with a girl playing asteroids game  
on an early implementation of  
the Watching Window

Thank you