VERSO LO SMART CAMPUS

SmartCampus SmartCamera networks

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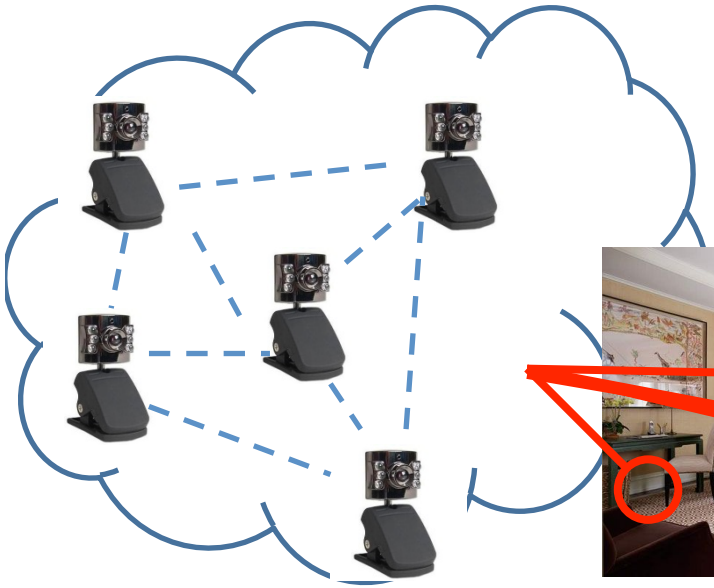
ISTI CNR

Basic research: Vision

- Detection and recognition of objects
  - Possibility of recognizing and retrieving location of an object in the building, using smart cameras
    - Example: where is my laptop now?
- Recognition of faces
  - Recognizing and tracking faces in the campus using smart cameras
    - Example: is this person allowed to enter Room A?
- Detection and tracking of people
  - Recognizing shapes of people and tracking them
    - Example: where did “this” person came and where did he go after he was seen in Room A?

Application context: SmartCamera Networks



Automatically recognize and localize objects and people

Interact with control center

- Using automated image recognition techniques on wireless camera networks
- Processing information on wireless cameras using distributed strategies
- Autonomously learn to recognize objects and interact with control center

Our project

- Object detection and recognition
  - Developing on-camera real-time algorithms for
    - Background modelling
    - Object (foreground) detection
    - Object model learning
    - Object recognition
- Recognition of faces
  - Developing on-camera distributed (P2P) real-time algorithms for face recognition and cross-camera tracking
- Detection and tracking of people
  - Developing hybrid on-camera/server side algorithms for people detection/tracking and retrieval

P2P smart camera network

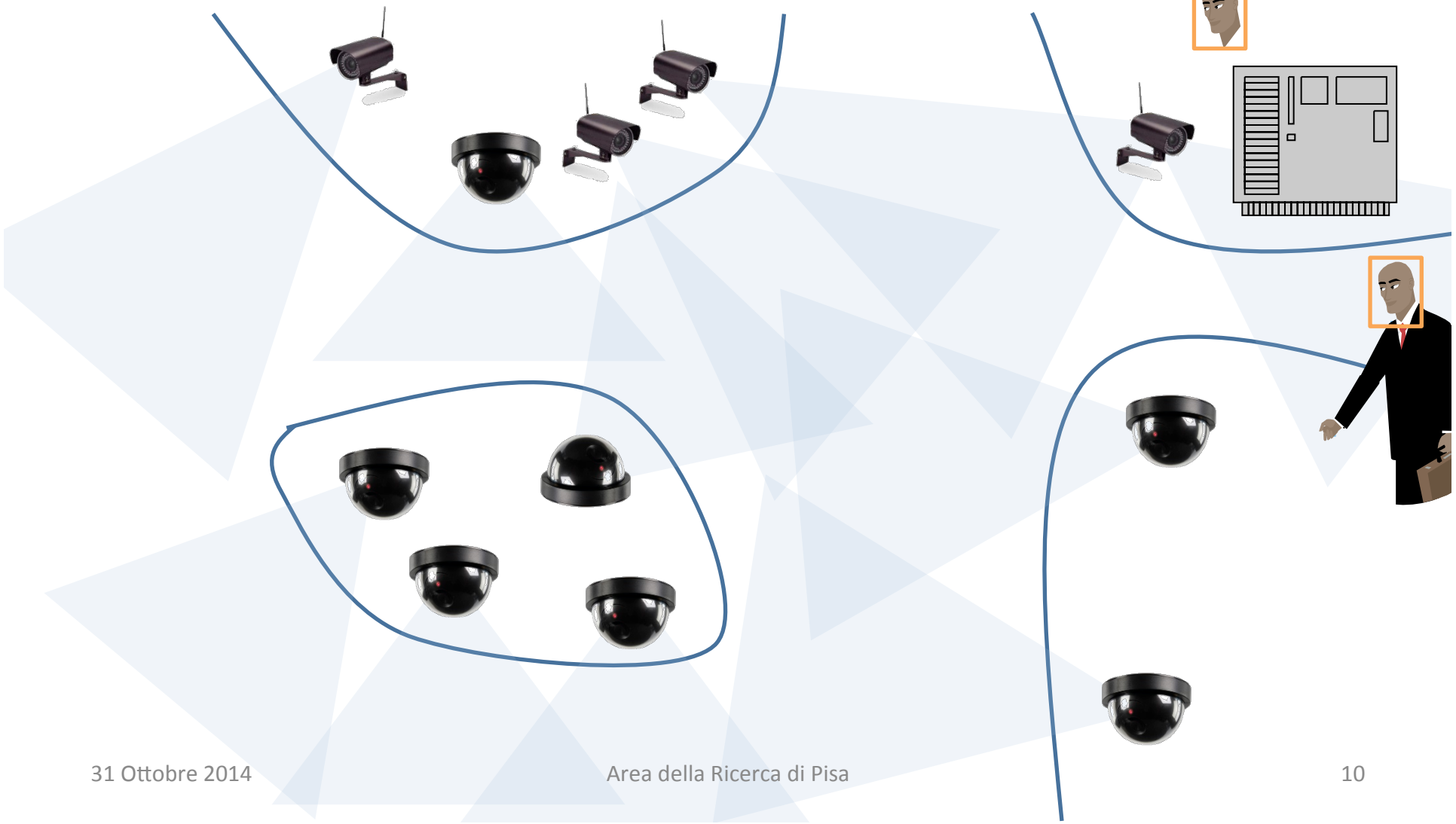
cameras' field of view

People face detection, recognition, tracking

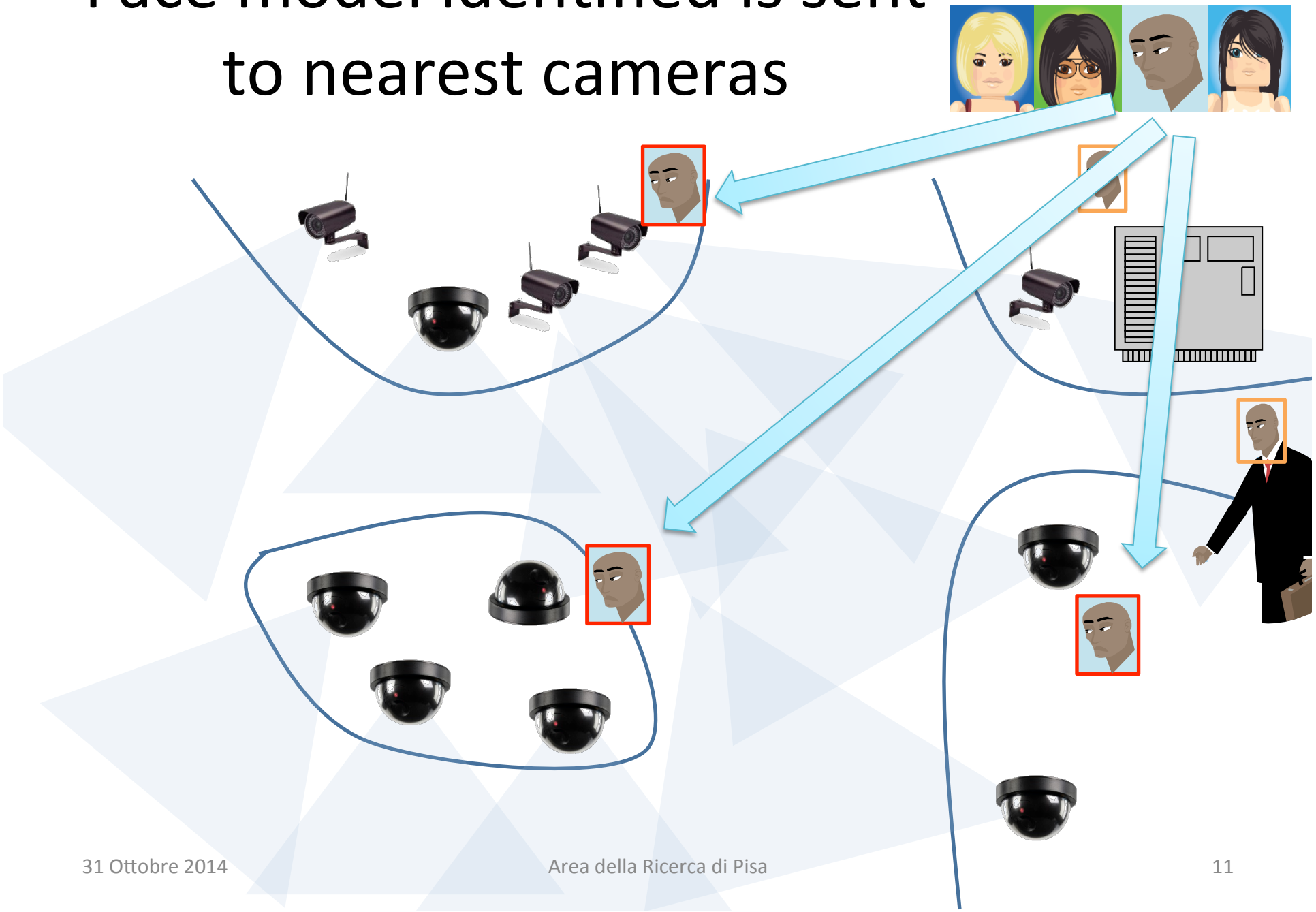
Detection

Face detect is sent to a big server

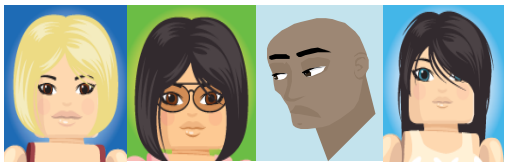
and matched using a DB of known people

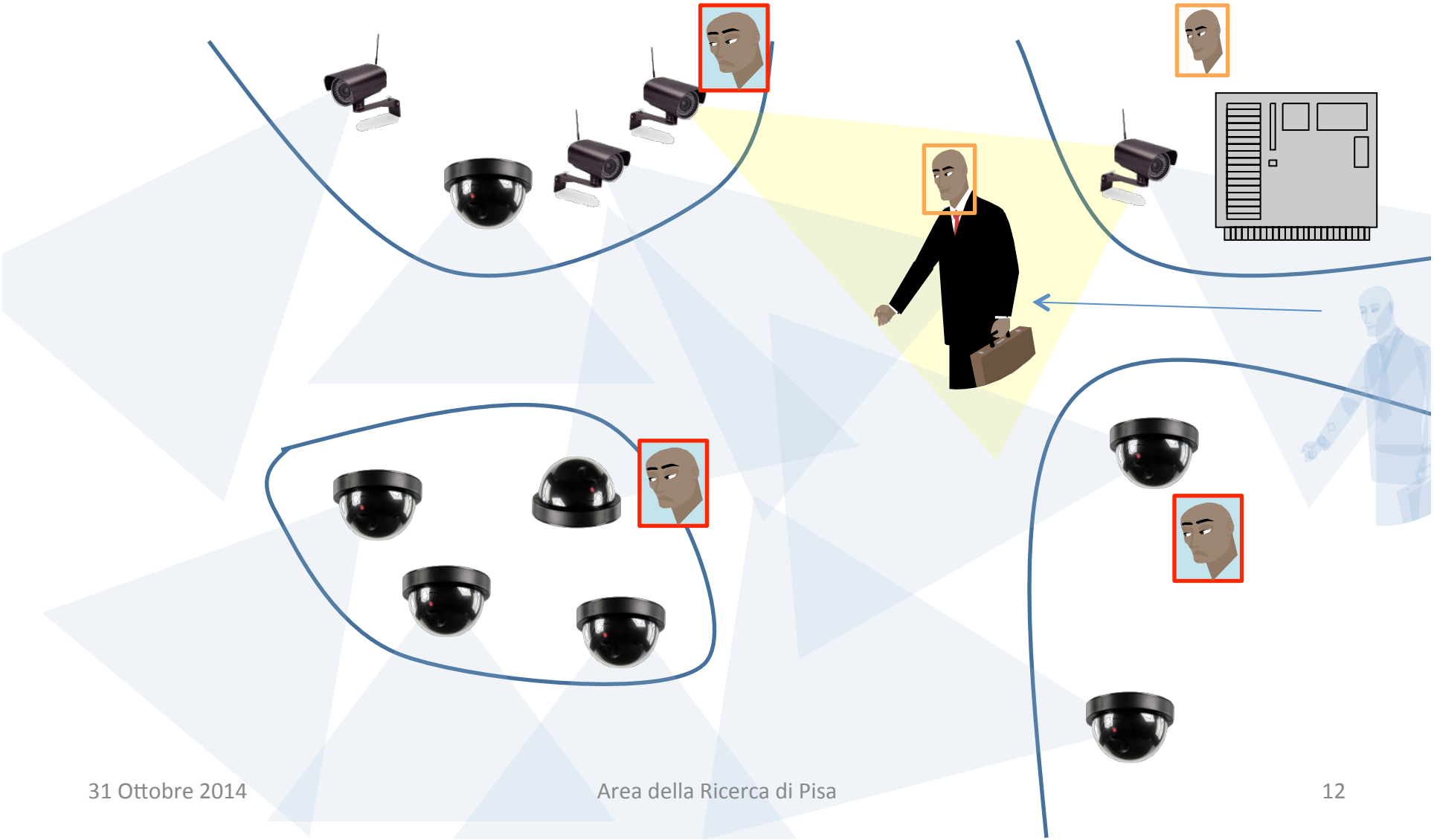


Face model identified is sent to nearest cameras

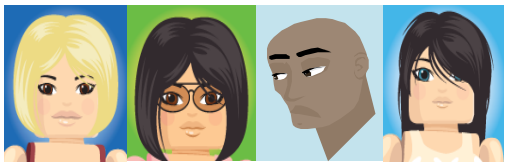


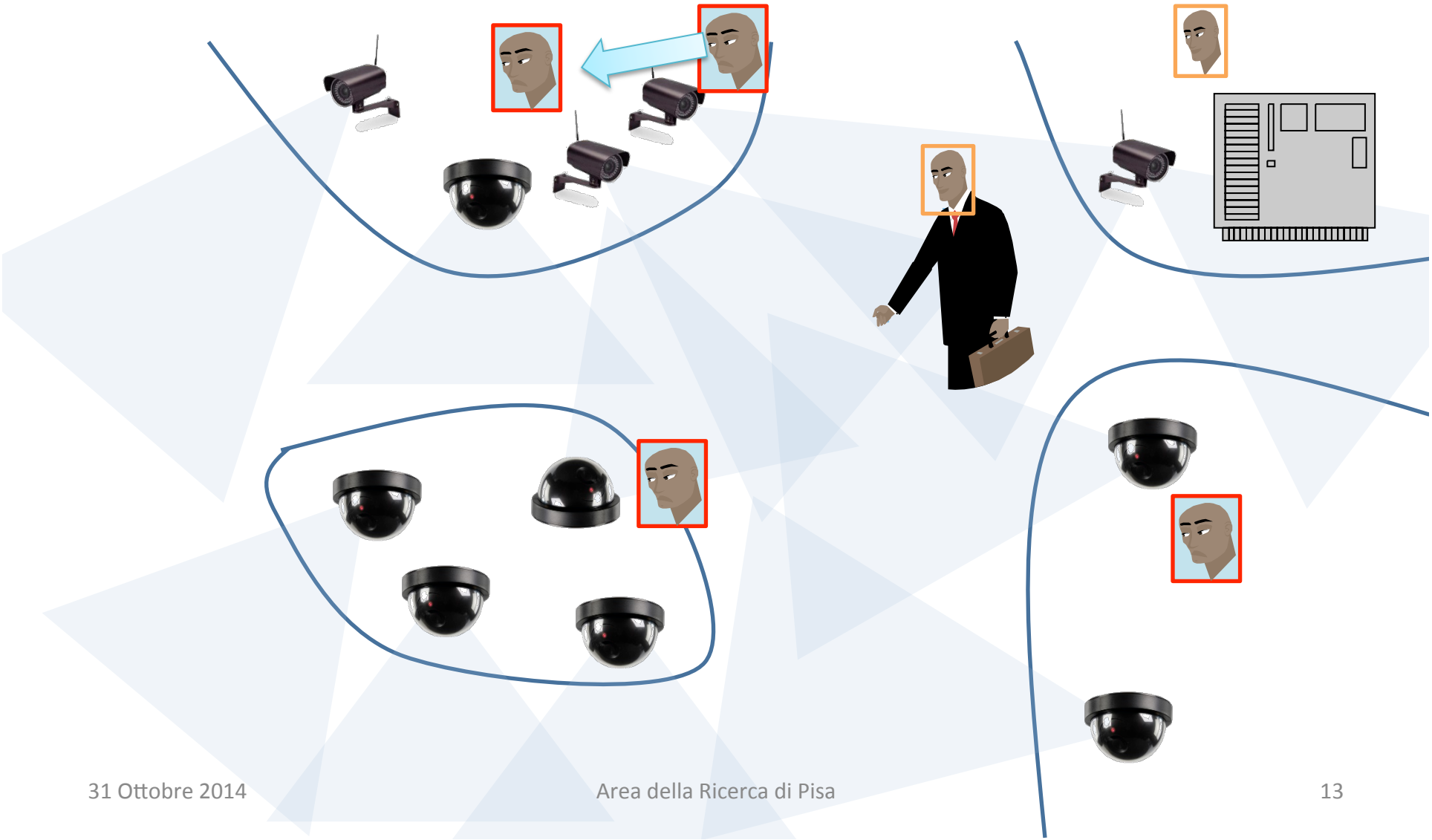
for tracking purposes



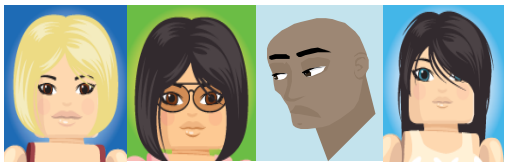


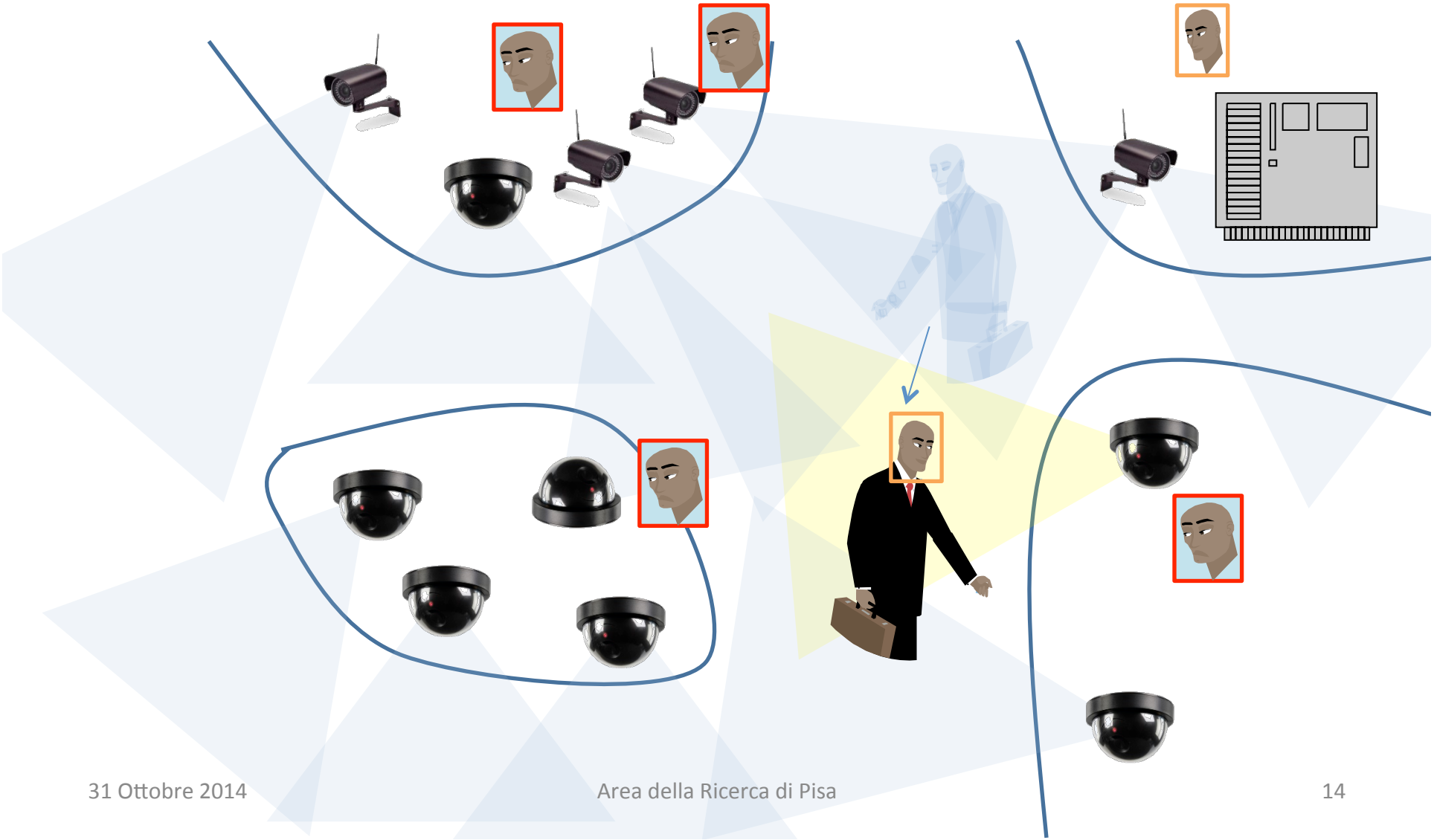
P2P smart camera network



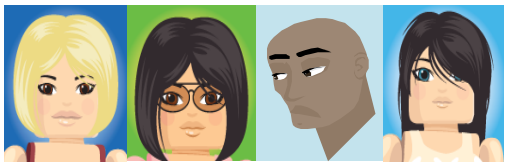


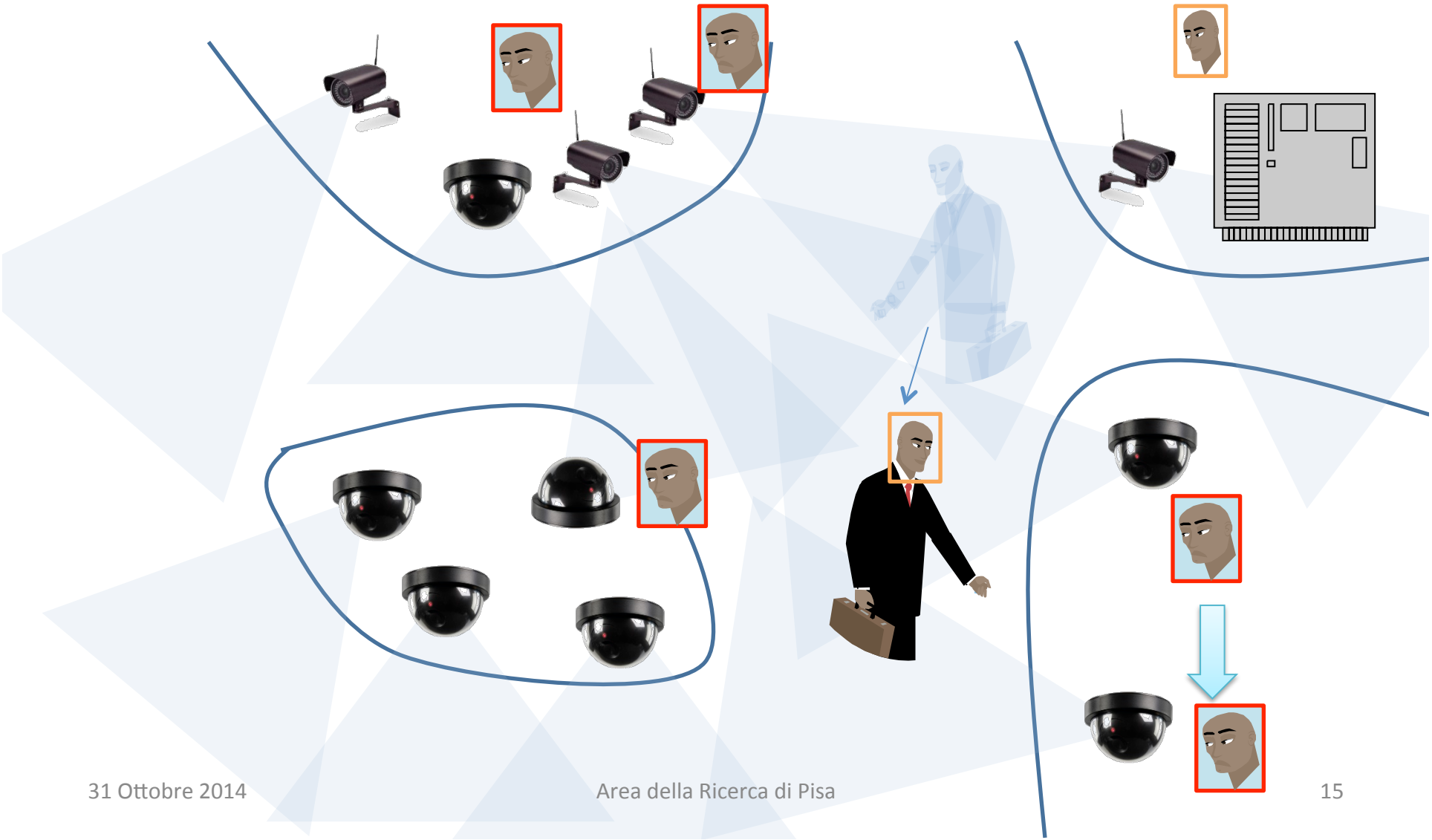
Face model propagation



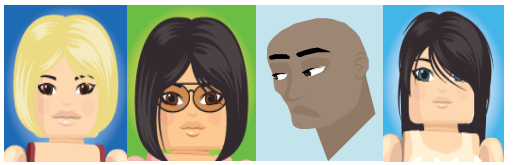


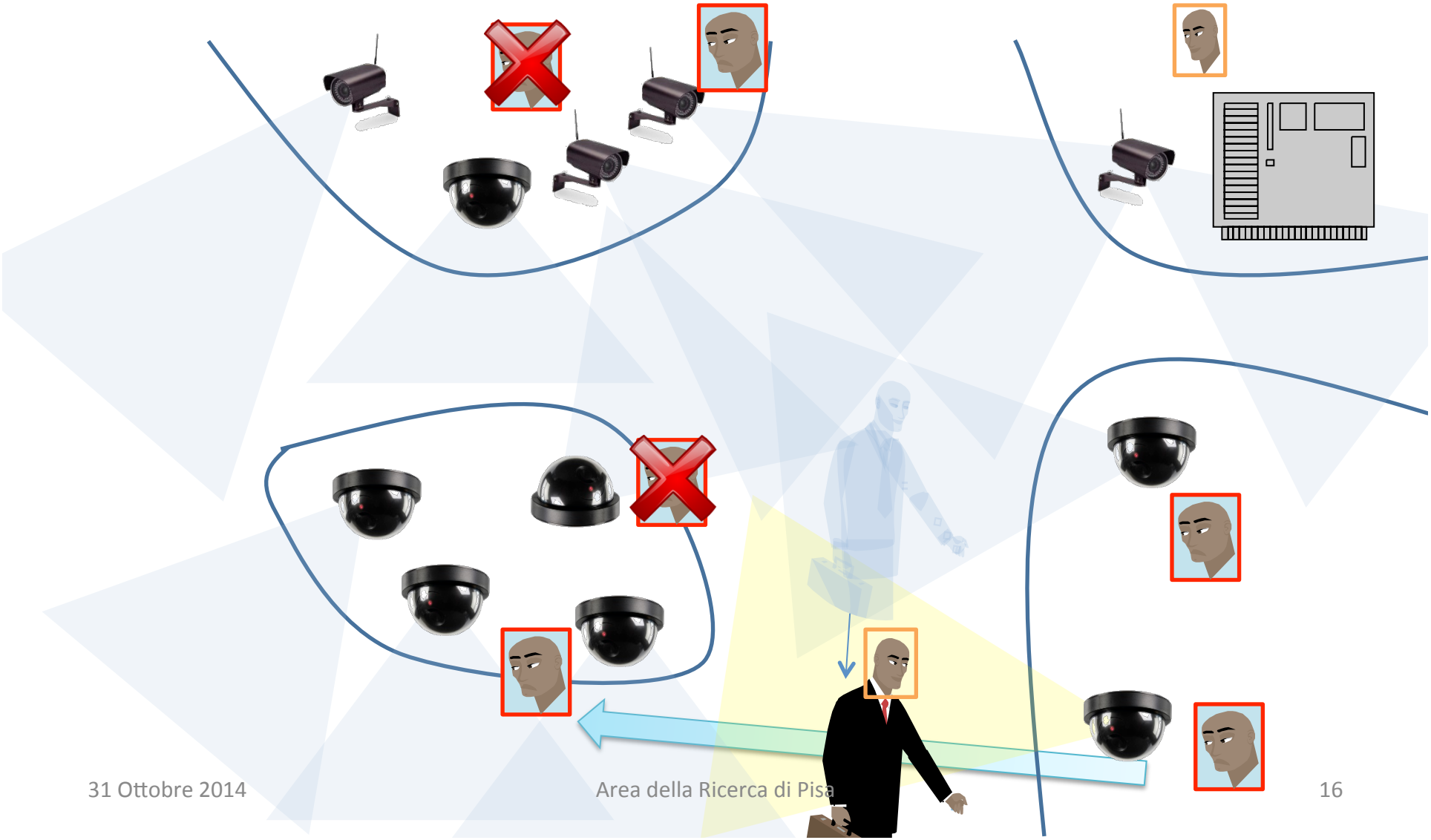
…and so on…



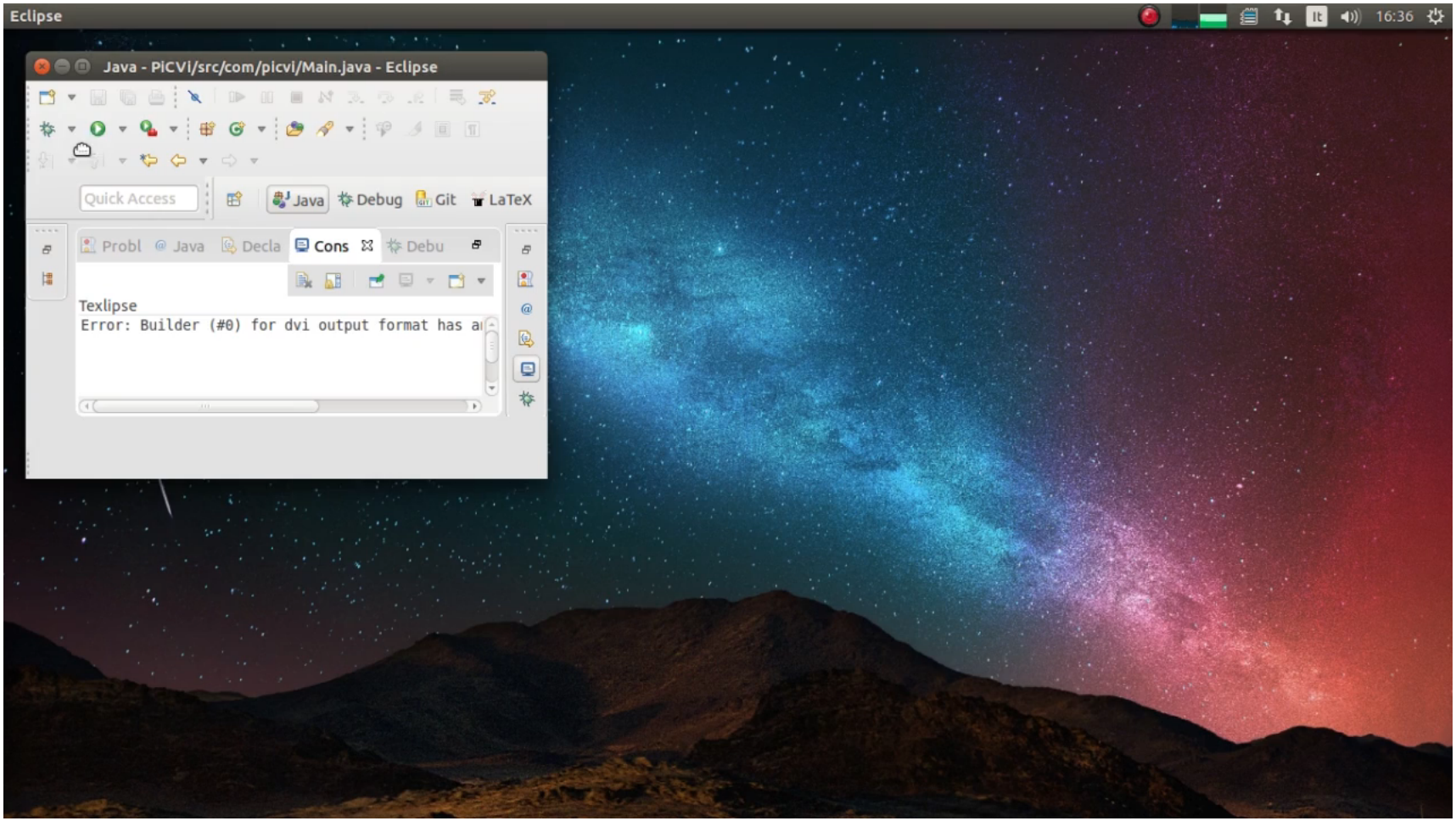


Face models have a short life time





Backgound modelling and object detection demo:



Where we are

- Object detection recognition
  - Developed algorithms for modelling indoor background
  - Developed Algorithms for object detection
  - Working on learning and recognition
- Distributed (P2P) face recognition
  - Working on a simulation of the P2P network of smart cameras
  - Face recognition algorithms working on server side