PTZ camera assisted object detection and tracking

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Introduction

▪ **Objective:**

➢ To acquire high resolution face images *for each person* from a PTZ camera.

▪ **Challenges:**

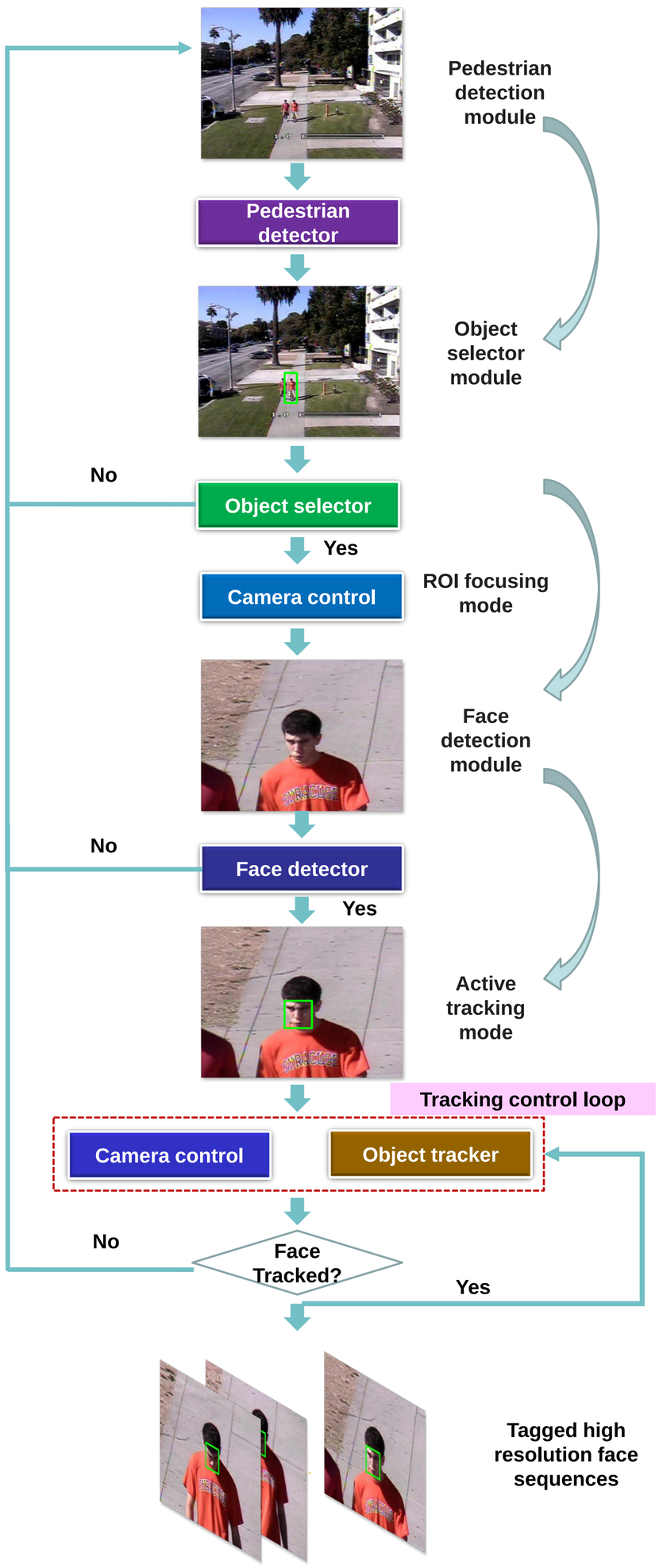
➢ Multiple people in the scene.

➢ Appearance changes due to varying viewpoints, illumination changes, clutters, delay in network.

▪ **Highlights:**

➢ A novel fully automatic system with state-of-art detection, tracking and camera control components.

Overview of Our Approach



Components of Our System

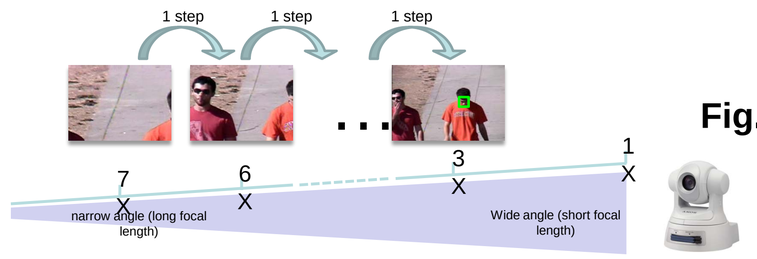


Fig. one-step back strategy

A. Pedestrian detection module:

70ms to scan 640x480 test image

B: Object selector module:

check if the face of that object is already captured before or not.

C. ROI focusing module:

zoom to 1/5 upper part when a pedestrian is detected .

D. Face detection module:

real-time using illumination invariant Local Structure Features and cascade structure.

20 fps on 640x480 image

E. Camera control module:

uses relative control commands with time-sharing strategy and one-step back strategy

F. Tracking module:

Tracking-Modeling-Detection concept

• Short term KLT tracker:

• Randomized forest classifier: object detector to filter non-object regions.

• Online template-based appearance model: learn all of variations of the object over time.

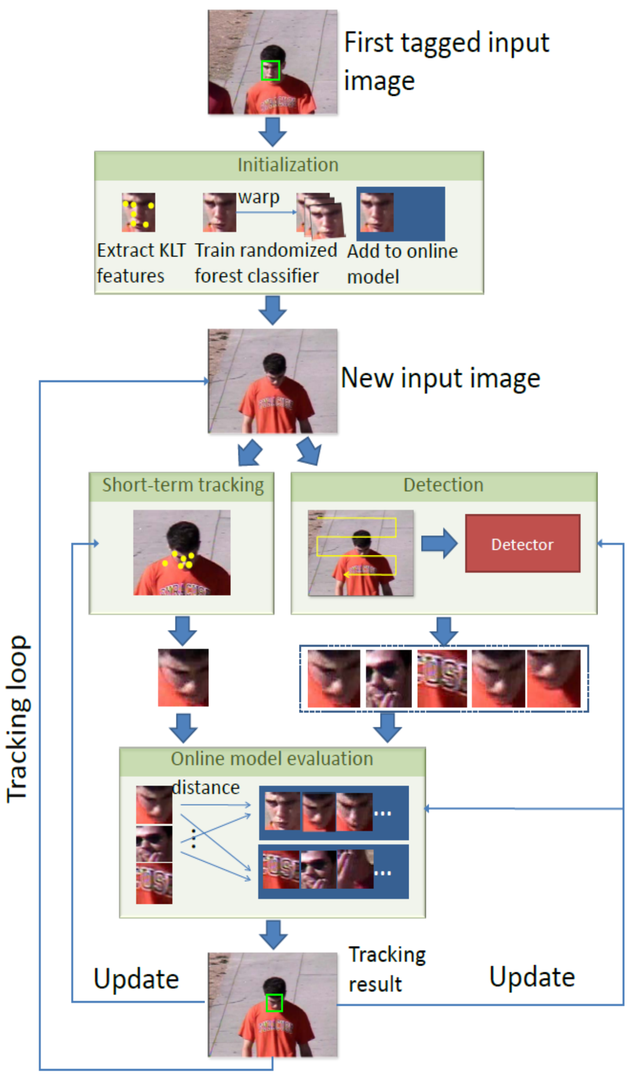


Fig. Tracking flowchart

Experimental Results

• System: Intel Xeon 3.00Ghz with a single thread. Camera: Sony PTZ network camera SNC-RZ50N (−170˚,+170 ˚), tilt angles (−90 ˚,+25 ˚), and a large zoom ratio (25X optical). Runs at 15fps.

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