WiFi Sensors Meet Visual Tracking For An Accurate Positioning System

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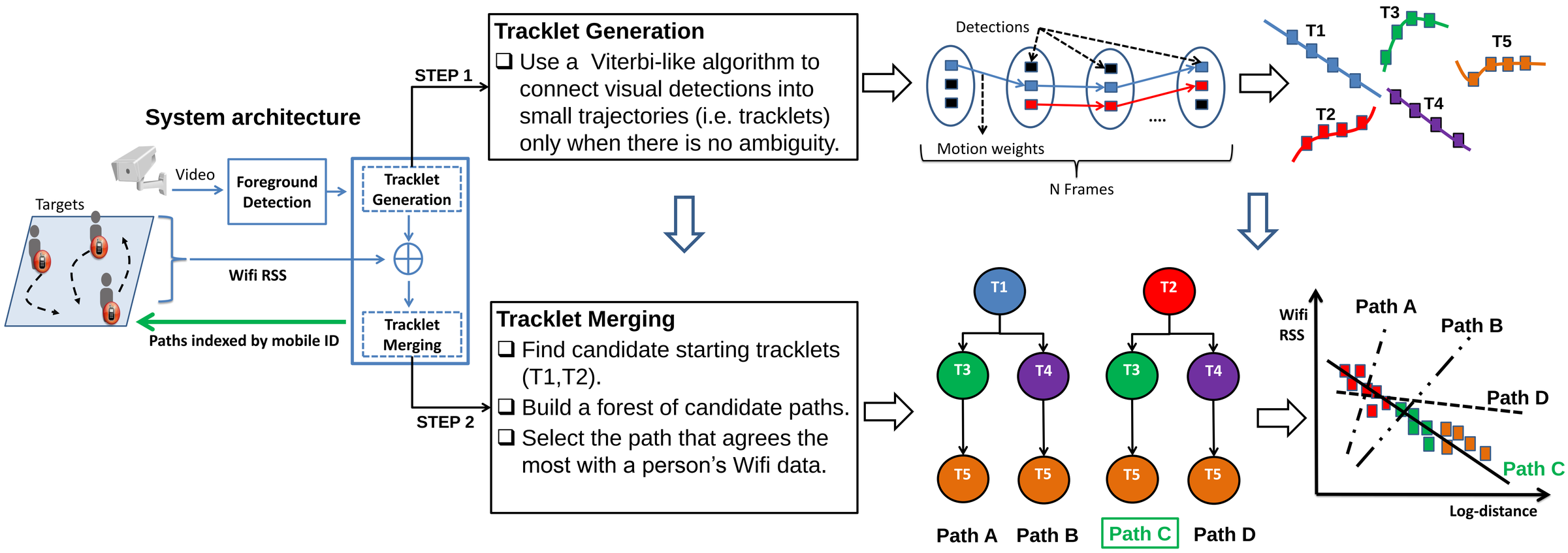
Motivation

- ❑ Nowadays an increasing number of indoor spaces are equipped with surveillance cameras and Wifi access points.
- ❑ Visual tracking is an appealing approach for accurate localization.
- ❑ However, it lacks strong identification accuracy.
- ❑ Tracking performance decreases in many cases due to uninformative appearance features, complex human motion, etc.

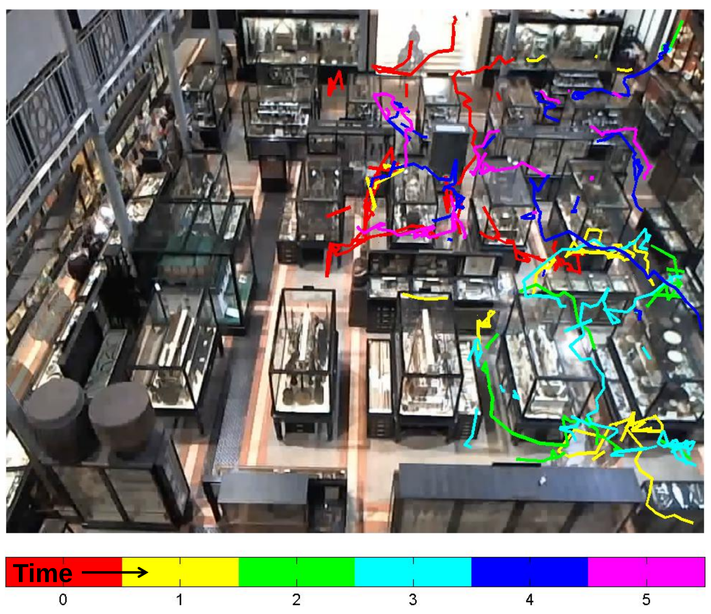
Main Objectives

- ❑ Provide visual tracking with strong Wifi identification.
- ❑ Improve visual tracking in complex scenarios:
  - Uninformative appearance features.
  - Complex human motion.
  - Long term occlusions.

Proposed Approach



Preliminary Results



Tracklet Generation.

Tracklet Merging: The most likely path (tracklet combination) given a person's Wifi data.

Person's ground truth trajectory.

Summary

- ❑ The proposed positioning system integrates Wifi sensing with visual tracking.
- ❑ The key novelty is that it uses Wifi measurements to identify visual trajectories and resolve ambiguities due to occlusions, missing detections and poor appearance features.
- ❑ A testbed has been deployed at the Pitt Rivers museum in Oxford.
- ❑ Preliminary results on real world data show that the proposed approach is able to uniquely identify and accurately track a person under long term occlusions and without requiring the use of appearance features.

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