

# Appearance-based Re-Identification of Persons

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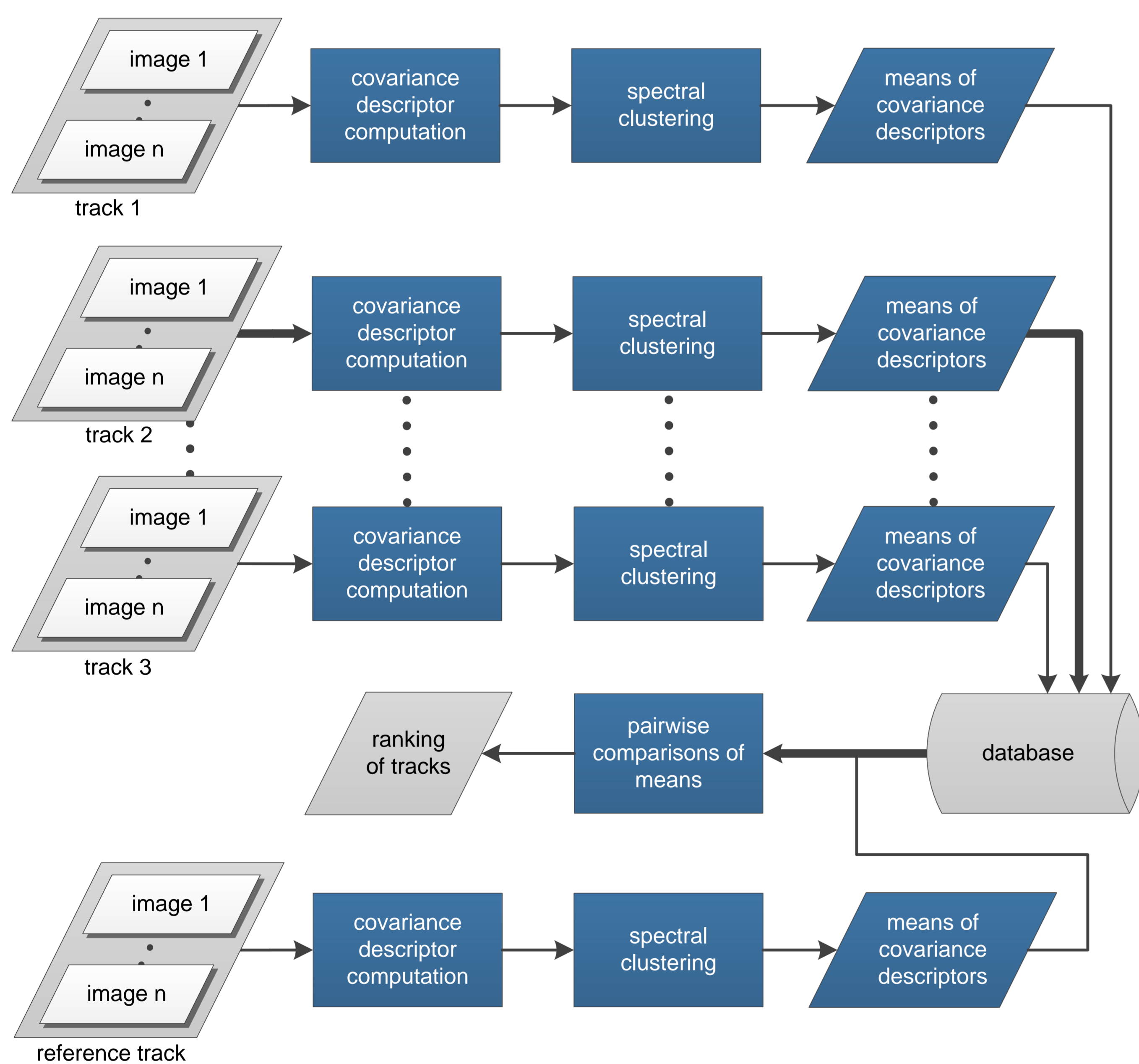
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In the context of CamInSens, the objective of person re-identification is to recognize a specific individual at different locations and to determine whether an individual has already been seen. This is of general interest in multi-camera networks with non-overlapping fields of view. However, significant changes in appearance of persons as well as different illumination, camera parameters etc. make this task difficult. Furthermore, in surveillance scenarios only low-resolution videos are usually available, so that biometric approaches may not be suitable. In CamInSens, a whole-body appearance-based person re-identification approach has been developed for robust tracking of people over gaps in multi-camera networks.

## Motivation / Overview

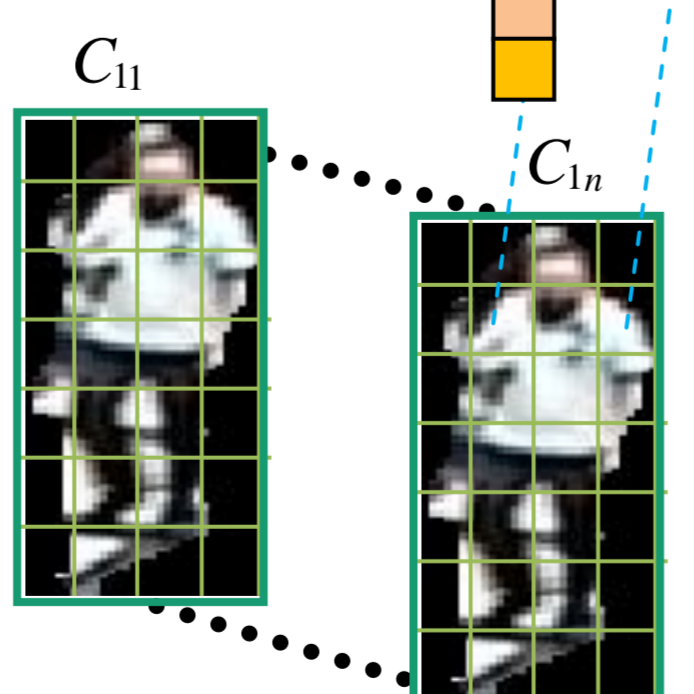
- Aim: locating individuals and tracing their paths in camera networks based on their appearance
- Challenges: occlusions, non-overlapping fields of view, low resolution



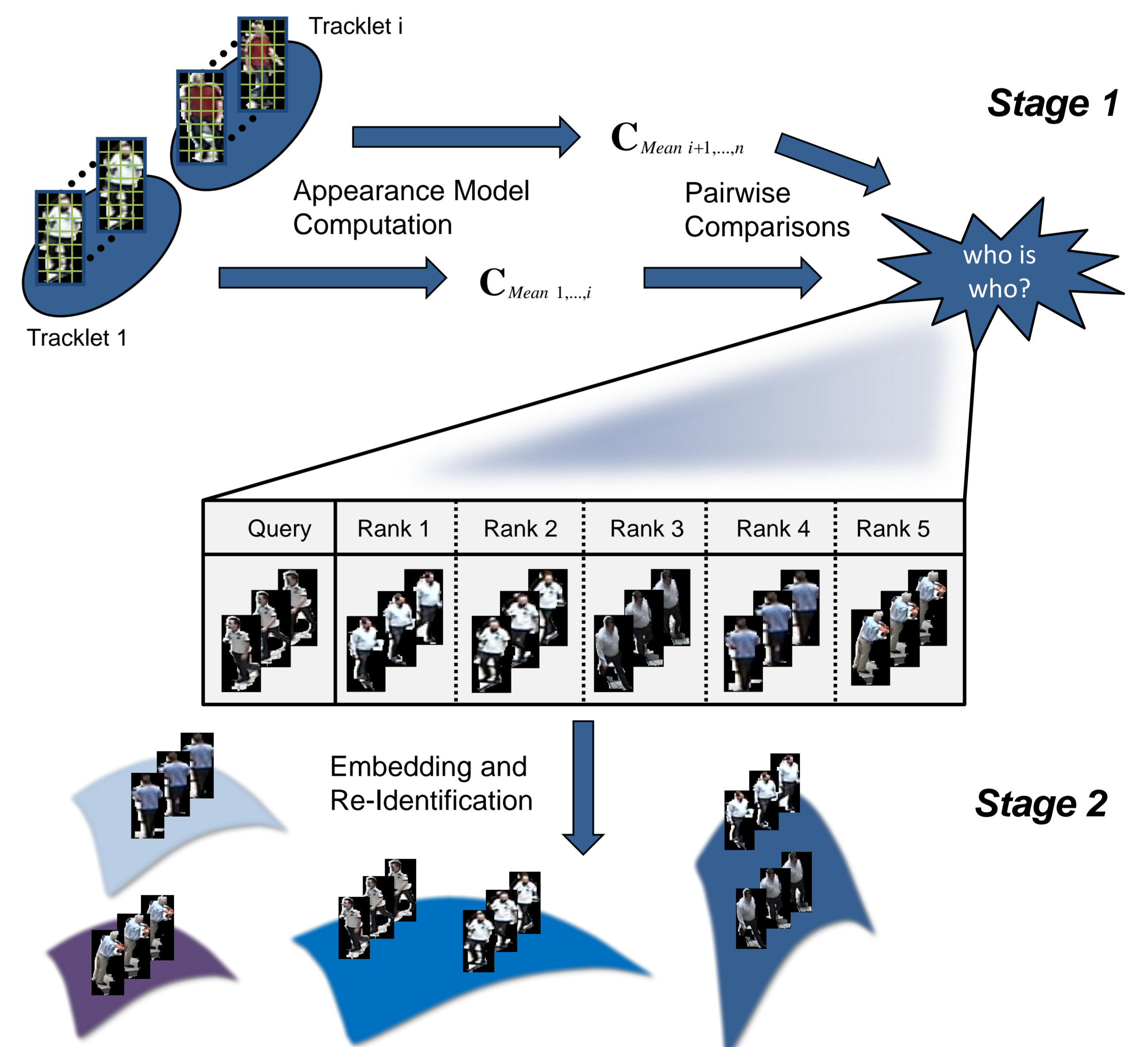
## Appearance Model

- Based on image region descriptor (covariance descriptor)
- Each tracklet is represented by a set of covariance descriptor means
- Insensitive to noise and changes of means
- Automatic determination of the number of means using spectral clustering (eigengap heuristic)

$$f(x, y) = (y, R(x, y), G(x, y), B(x, y))^T$$

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## Two-stage Re-Identification



## Results

Ranking results		
Rank	Stage 1	Stage 2
1	69.03%	88.46%
≤2	85.76%	95.38%
≤3	93.27%	98.85%
≤4	97.16%	100.00%
≤5	100.00%	100.00%

- Dataset: 96 tracklets, 21 persons
- Table columns specify for every rank the percentage of the correct corresponding tracklets (rankings from stage 1 not being among the top five ranks are not considered)

## Benefits

- Pre-processing methods are not required
- Applicable to low-resolution videos
- Outperforms multi-shot RGB histogram approaches
- Faster than conventional multi-shot approaches