

Towards Practical Object Trackers: From Feature Combination to Modality Fusion

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OBJECTIVES

1. Developing robust visual tracking and object re-detection framework based on information fusion techniques to handle large appearance variations and tracking loss
2. Developing feature combination models which can adaptively combine appropriate visual features
3. Developing modality fusion models which can exploit the complementarity of other non-visual modalities (data sources) for appearance modeling

HIGHLIGHTS

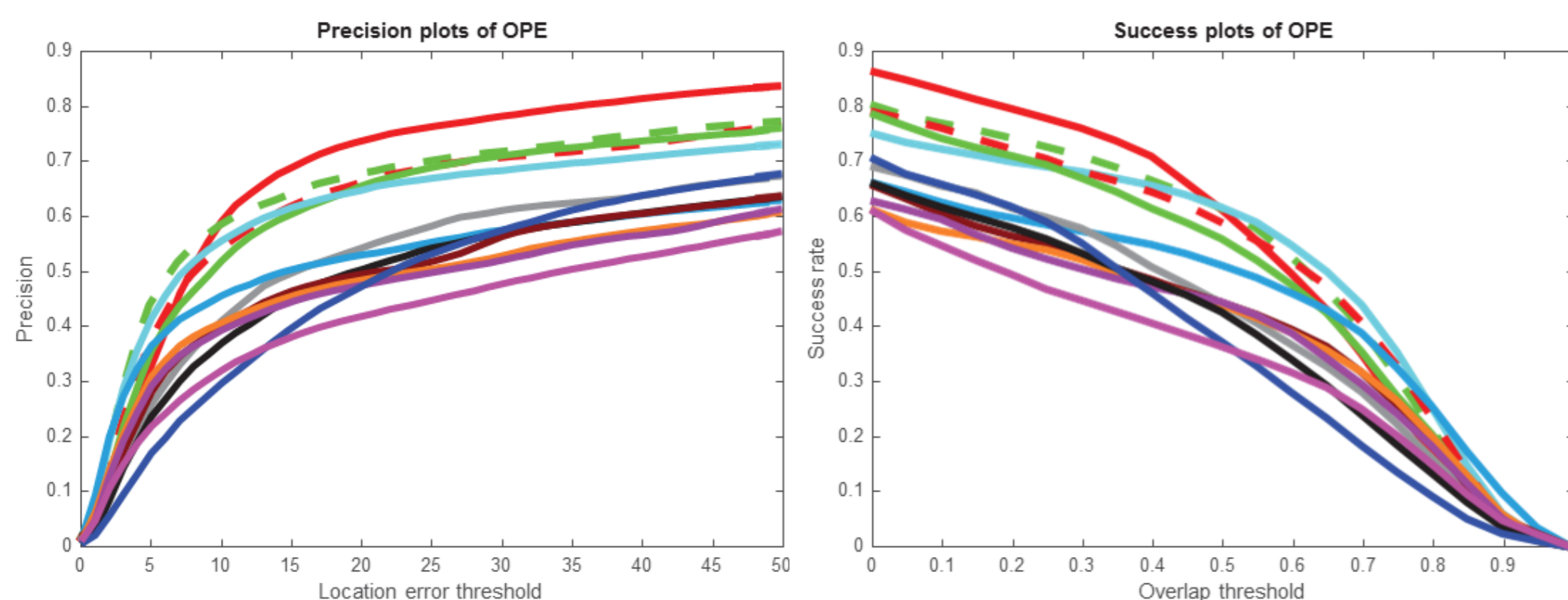
Robust Feature Level Fusion based on Joint Sparse Representation

- Inheriting all the advantages of joint sparse representation and is able to fuse multiple features for object tracking
- Detecting and removing unreliable features for feature-level fusion
- A general framework which is able to dynamically combine multiple kernels with multiple features

Robust Collaborative Discriminative Learning for RGB-Infrared Tracking

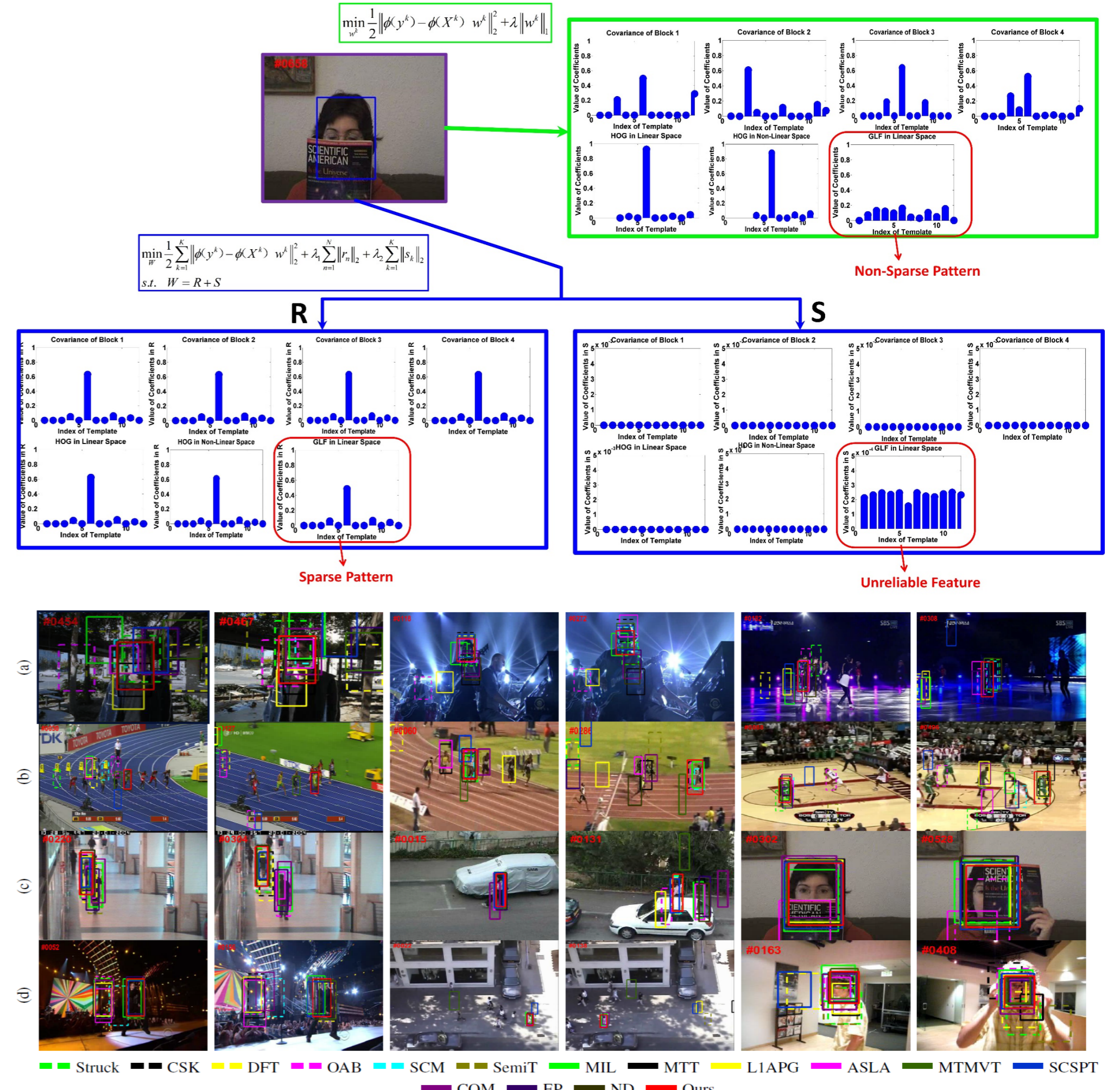
- A novel discriminative learning framework is proposed to learn classifiers and reliability weights of different modalities for RGB-infrared Tracking
- A new feature learning scheme is incorporated the learning framework to learn discriminability consistent uncontaminated features from heterogeneous
- An efficient optimization algorithm is derived to solve the learning model.

Some Quantitative and Qualitive Results



Learning Common and Feature-Specific Patterns for Feature Combination

- Inheriting all the advantages of joint sparse representation and is able to fuse multiple features for object tracking
- Detecting and removing unreliable features for feature-level fusion
- A general framework which is able to dynamically combine multiple kernels with multiple features



SELECTED PUBLICATIONS

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8. X. Lan, M. Ye, S. Zhang, P. C. Yuen: Robust Collaborative Discriminative Learning for RGB-Infrared Tracking. *AAAI 2018*: 7008-7015
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