Chapter 6
Conclusion

Abstract Generally, this book provides a systematic study on the human action analysis problems based on tree-based approaches. This chapter concludes the four approaches presented in this book.

Keywords Action recognition · Action detection · Action search · Action prediction · Tree based approach

To analyze human actions in videos, we proposed four effective and efficient algorithms for different human action analysis tasks. In Chap. 2, we presented a random forest-based template matching method to detect actions, which significantly improve the speed issue for human action recognition and detection with the help of spatial downsampling and Top-K search. In Chap. 3, the speed is further improved with the help of coarse-to-fine branch and bound search, which makes it possible for real-time action search. Besides, unsupervised random indexing tree is used to implement the multiple visual vocabularies, which can improve the matching accuracy of the local interest points. In Chap. 4, we proposed Hough voting-based approach for human action recognition and action search search. Unsupervised random projection trees is utilized to leverage the underlying data distribution. With the help of propagative Hough voting, the local interest point matching is improved by the spatio-temporal configuration of local interest points. Following the framework in Chap. 4, we proposed multiclass balanced random forest to handle the action prediction problem in Chap. 5.

G. Yu et al., *Human Action Analysis with Randomized Trees*,
SpringerBriefs in Signal Processing, DOI 10.1007/978-981-287-167-1_6