Recognizing Gaits Across Views Through Correlated Motion Co-Clustering

Abstract:

Human gait is an important biometric feature, which can be used to identify a person remotely. However, view change can cause significant difficulties for gait recognition because it will alter available visual features for matching substantially. Moreover, it is observed that different parts of gait will be affected differently by view change. By exploring relations between two gaits from two different views, it is also observed that a part of gait in one view is more related to a typical part than any other parts of gait in another view. A new method proposed in this paper considers such variance of correlations between gaits across views that is not explicitly analyzed in the other existing methods. In our method, a novel motion co-clustering is carried out to partition the most related parts of gaits from different views into the same group. In this way, relationships between gaits from different views will be more precisely described based on multiple groups of the motion co-clustering instead of a single correlation descriptor. Inside each group, a linear correlation between gait information across views is further maximized through canonical correlation analysis (CCA). Consequently, gait information in one view can be projected onto another view through a linear approximation under the trained CCA subspaces. In the end, a similarity between gaits originally recorded from different views can be measured under the approximately same view. Comprehensive experiments based on widely adopted gait databases have shown that our method outperforms the state-of-the-art.