

We address the problem of face video retrieval in TV-series, which searches video clips based on the presence of specific character, given one face track of his/her. This is tremendously challenging because on one hand, faces in TV-series are captured in largely uncontrolled conditions with complex appearance variations, and on the other hand, retrieval task typically needs efficient representation with low time and space complexity. To handle this problem, we propose a compact and discriminative representation for the huge body of video data, named compact video code (CVC). Our method first models the face track by its sample (i.e., frame) covariance matrix to capture the video data variations in a statistical manner. To incorporate discriminative information and obtain more compact video signature suitable for retrieval, the high-dimensional covariance representation is further encoded as a much lower dimensional binary vector, which finally yields the proposed CVC. Specifically, each bit of the code, i.e., each dimension of the binary vector, is produced via supervised learning in a max margin framework, which aims to make a balance between the discriminability and stability of the code. Besides, we further extend the descriptive granularity of covariance matrix from traditional pixel-level to more general patch-level, and proceed to propose a novel hierarchical video representation named spatial pyramid covariance along with a fast calculation method. Face retrieval experiments on two challenging TV-series video databases, i.e., the Big Bang Theory and Prison Break, demonstrate the competitiveness of the proposed CVC over the state-of-the-art retrieval methods. In addition, as a general video matching algorithm, CVC is also evaluated in traditional video face recognition task on a standard Internet database, i.e., YouTube Celebrities, showing its quite promising performance by using an extremely compact code with only 128 bits.