

Image Classification Based on Sparse Representation

Abstract:

High data dimensionality and lack of human knowledge about the effective features to classify the data are two challenging problems in computer vision and pattern recognition. The sparse representation-based classifier (SRC) significantly differentiates itself from the other classifiers in three aspects. One is the utilization of training samples of all classes collaboratively to represent the query images and another is the sparse representation code that coincides with the general classification target. The last is the L1-norm minimization of the representation error that enables SRC to recognize query images heavily corrupted by outlier pixels and occlusions. These three merits of SRC lead to some encouraging and impressive image recognition results, which attract great interest in further research on SRC. Many extensions of SRC are proposed in recent years. In this talk, we first help audience to have a deep understanding to the underline principles of SRC, i.e., how and why the sparse representation can be utilized to solve classification problems and the key advantages of this approach. The deep understanding to the SCR is necessary to analyze and find the problems and limitations of the SRC. These analyses and findings pave the way for us to investigate how the recent developments solve these problems and overcome the limitations of SRC, which bring the sparse representation-based image classification to a significantly higher level.