

Recovering low-rank and sparse subspaces jointly for enhanced robust representation and classification is discussed. Technically, we first propose a transductive low-rank and sparse principal feature coding (LSPFC) formulation that decomposes given data into a component part that encodes low-rank sparse principal features and a noise-fitting error part. To well handle the outside data, we then present an inductive LSPFC (I-LSPFC). I-LSPFC incorporates embedded low-rank and sparse principal features by a projection into one problem for direct minimization, so that the projection can effectively map both inside and outside data into the underlying subspaces to learn more powerful and informative features for representation. To ensure that the learned features by I-LSPFC are optimal for classification, we further combine the classification error with the feature coding error to form a unified model, discriminative LSPFC (D-LSPFC), to boost performance. The model of D-LSPFC seamlessly integrates feature coding and discriminative classification, so the representation and classification powers can be enhanced. The proposed approaches are more general, and several recent existing low-rank or sparse coding algorithms can be embedded into our problems as special cases. Visual and numerical results demonstrate the effectiveness of our methods for representation and classification.