

Talk Abstract:

The challenge of facial age estimation mainly comes from two difficulties: (1) the visual appearance is diversely different even within the same age group, and (2) only a limited number of labeled face images is available in real cases. Since previous research on human cognition showed that human beings could easily rank the relative ages of face images, the age rank should play a more important role in age estimation than visual appearance attributes. In this talk, we interpret this problem as a cognitive strategy by determining age ranks. Assuming that the age ranks could be characterized by a set of ranking features lying on a low-dimensional space, we propose a simple and flexible subspace learning method by solving a sequence of constrained optimization problems. With our optimization, both the aging manifold, which relies on exact age labels, and the implicit age ranks are jointly embedded in the proposed subspace. In addition to supervised age estimation, our method also works well in semi-supervised age estimation once the age ranks of unlabeled data can be approximated. We will also show the feasibility of automatic age ranking. With the approximated age ranks, we could successfully include more available data to improve the feature discriminability. The experimental results on age estimation demonstrate that our method outperforms classical subspace learning approaches and makes a breakthrough in semi-supervised learning under different scales and sources of dataset.