**Thesis:** Learning Deep Visual Features From Limited Labeled Data

**Abstract:** Large-scale labeled datasets are generally required to train deep neural networks in order to obtain better performance in visual feature learning for computer vision applications. To reduce the extensive cost of collecting and annotating large-scale datasets, various machine learning methods are proposed to learn general visual features including semi-supervised learning methods which learn visual features from a small size of labeled data and a large amount of unlabeled data, weakly supervised learning methods which learn visual features from coarse-grained labeled data, and self-supervised learning methods which learn visual features from large-scale unlabeled data. To overcome the expensive cost of data collection and annotation, we proposed a weakly supervised image feature learning method, a semi-supervised video feature learning method, and a self-supervised 3D feature learning method for different tasks. We validated the effectiveness of the proposed methods on different datasets and showed that the proposed methods indeed can learn visual features from limited labeled data.

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