Complementing Representation Deficiency in Few-shot Image Classification: A Meta-Learning Approach

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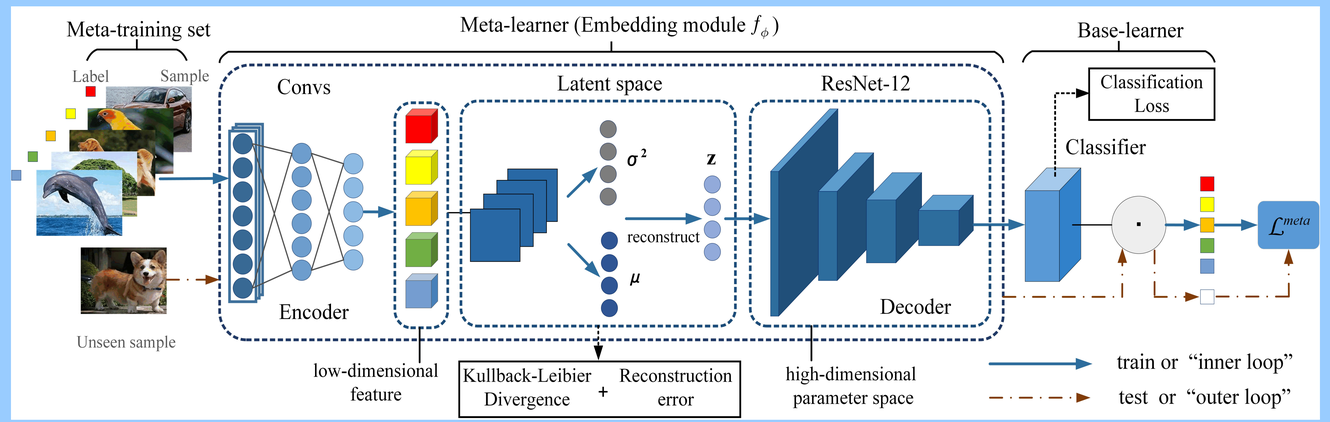
1 Background and Problem

Few-shot learning is a challenging problem that has attracted more and more attention recently since abundant training samples are difficult to obtain in practical applications.

The representation deficiency commonly exists, since it is hard to discover common information from a small number of training samples or even one, as is the representation of key features from such little information.

2 Methods



3 Contribution

- We propose an end-to-end framework and interpolate a latent space to endue the reconstructed latent codes with more information, complementing the representation deficiency in a high-dimensional parameter space.
- The probabilistic latent space with stochastic initialization collaborates well with different base-learners and can be extended to other architecture with high-dimensional feature extractors in few-shot learning.
- We optimize the framework leveraging new loss function for the proposed latent space, which acquires better generalization across tasks and achieves the state-of-the-art performance in few-shot learning classification tasks

4 Result

In general, compared to the baseline and current state-of-the-art methods, the accuracies of our model in 5-way 1- and 5-shot classification tasks both get improved.

On the challenging standard dataset miniImageNet, compared to the baseline, the classification accuracy is increased by up to 5%.

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