Supplementary material

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1 5-shot experiments

For the 5-shot case, we experiment with two different ways of averaging the support instances to form a prototype. Pre-avg averages the support instances before the BaseTransformer. The closest base instances in this case are sampled randomly from the 5 closest base classes using semantic similarity as described in Section 3.4 in the main paper. In contrast, for post-avg we adapt each support instance and its corresponding set of closest base instances independently and the prototype is obtained by averaging the adapted support instances after the BaseTransformer. Table 3 reports the results for both pre-avg and post-avg for 5-shot classification on the mini-ImageNet dataset using a ResNet12 encoder. Here we can see that pre-avg works much better than post-avg for the ResNet12 encoder. We believe that this could be because averaging the support instances results in a more robust input to the BaseTransformer, aiding in its training.

2 Tiered-ImageNet and CUB detailed results

Detailed results with 95% confidence intervals are reported for the tiered-ImageNet and CUB datasets in Table 1 and Table 2 respectively. We have reported tiered-ImageNet results only for the ResNet12 encoder.

3 Comparison with Semantic knowledge baselines

Previous methods that use semantic knowledge [1, 6, 7, 10] use it explicitly to structure the feature space, while we use it only for querying. Despite this, our method outperforms all these methods (see Table 4).

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Table 1: 5-way 1-shot and 5-way 5-shot classification accuracy (%) on tiered-ImageNet dataset for ResNet-12. The numbers in bold are the best performing methods for the corresponding setting.

Setups	1-shot	5-shot
ProtoNets [8]	65.65±0.92	83.40±0.65
SimpleShot [9]	69.75±0.20	85.31±0.15
FEAT [12]	70.80±0.23	84.79±0.16
CAN [3]	69.89±0.51	84.23±0.37
DeepEMD [13]	71.16±0.87	86.030.58
IEPT [14]	72.24±0.50	86.73±0.34
MELR [2]	72.14±0.51	**87.01**±0.35
InfoPatch [4]	71.51±0.52	85.44±0.35
DMF [11]	71.89±0.52	85.96±0.35
META-QDA [15]	69.97±0.52	85.51±0.58
PAL [5]	72.25±0.72	86.95±0.47
BaseTransformer	**72.46**±0.19	84.96±0.18

Table 2: 5-way 1-shot and 5 way 5-shot classification accuracy (%) on CUB dataset. The numbers in bold are the best performing methods for the corresponding setting.

Setups	1-shot		5-shot	
Backbone	Conv4-64	ResNet12	Conv4-64	ResNet12
ProtoNets [8]	51.31±0.89	66.09±0.92	70.77±0.70	82.50±0.58
FEAT [12]	68.87±0.22	-	82.90±0.15	-
DeepEMD [13]	-	75.65±0.83	-	88.69±0.50
IEPT [14]	69.97±0.49	-	84.33±0.33	-
MELR [2]	70.26±0.50	-	**85.01**±0.32	-
BaseTransformer	**72.15**±0.20	**82.27**±0.19	82.12±0.21	**90.64**±0.18

4 Visualization of learnt attention over base datapoints

We visualize the attention maps learnt by the BaseTransformer in Fig. 1. These are obtained by overlaying the resized attention map over the corresponding image of base instance selected by the querying function. We can see that for each support image, BaseTransformer has learnt to attend to visually similar regions of base instances. For example (Fig. 1 quadrant 2), for support instance nematode, the BaseTransformer learns to attend to the tentacle of jelly fish or the legs of harvestman to improve the prototype representation. It is also worth noting that in some cases the BaseTransformer is successful in identifying multiple visually similar features in base instance images when there are multiple instances of the class in one image. For example (Fig. 1 quadrant 4), for golden retriever, the BaseTransformer attends to two instances of gordon setter without being explicitly trained to identify multiple gordon setters.

Table 3: Results for different setups considered for averaging of support instances in 5-shot setting.

Setup	5-shot
Pre-avg	78.38±0.23
Post-avg	82.05±0.19

Table 4: Comparison with semantic knowledge baselines

Method	mini 1-shot	CUB 1-shot	tiered 1-shot
RS_FSL [11]	65.33±0.83	65.66±0.90	-
MS [2]	67.3	76.1	-
AM3 [10]	65.30±0.49	74.1	69.08±0.47
KTN [8]	64.42	-	-
BT (Ours)	70.88±0.17	82.27±0.19	72.46±0.19

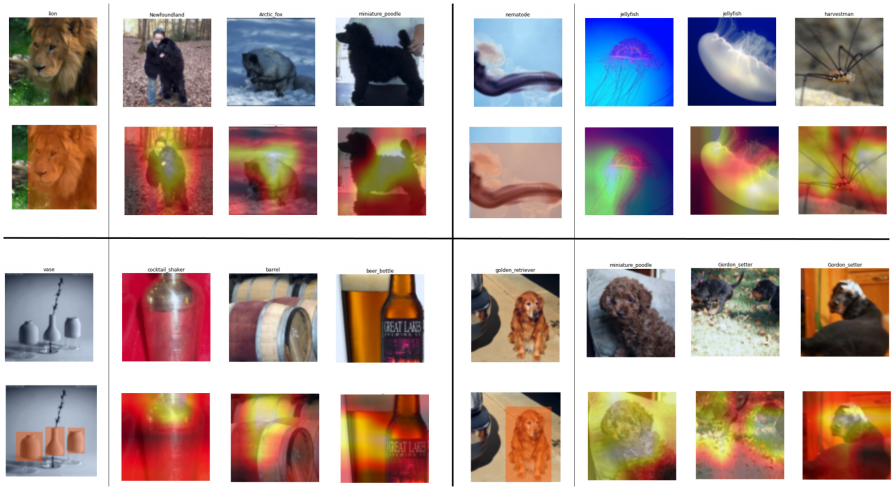

Figure 1: Left: support instance; right: the three closest base instances (top) and attention maps overlaid over the closest base instances (bottom). It can be seen that BaseTransformers learns to select visually similar features from the base feature space using the learnt part based correspondences. Warmer color corresponds to higher attention weight.

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