Supplementary Materials for Is Meta-Learning Always Necessary?: A Practical ML Framework Solving Novel Tasks at Large-scale Car Sharing Platform

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A. Supplementary Material

A.1. Car-Image

We elaborate on the **Car-Image** which our study employed as a *base dataset* in our problem setting. Car-Image is an annotated dataset consisting of 10 labels, and each label illustrates the individual state of the car. We described sample images of the dataset in Figure 1.

A.2. Real World Novel Tasks

In Figure 2, we illustrated sample images at each real-world novel tasks (*shape-shifted* and *texture-shifted task*).

A.3. Zero-Shot Image Retrieval Results

To provide more information regarding the zero-shot image retrieval, we described faulty retrieval results on *Document* and *Cars with Snow* samples from the unlabeled dataset (denoted as *Pool* in our study). We described faulty retrieval results on target labels of *Document* and *Cars with Snow* in Figure 3 (a) and Figure 3 (b). respectively. As the unlabeled *Pool* consists of randomly retrieved real world images, that dataset can be formulated as an *open-set* setting (many samples irrelevant to the target task exist). Upon the erroneously retrieved samples at both tasks, we expect more qualified representation power is necessary for sufficient performance on the zero-shot image retrieval in the real world.

Figure 1. Samples from the Car-Image. Each column illustrates an individual label of the dataset. From the the very left, each column represents *Normal*, *Defect*, *Dirt*, *Bubble Wash*, *Cars inside of the Washing Machine*, *Dashboard (Panel)*, *Cup Holder*, *Glovebox*, *Washer Fluid*, *Seat*.

(a) Shape-Shifted Task (b) Texture-Shifted Task

Figure 2. Two real-world novel task samples with novel labels scenarios. (a) Shifted-Shifted Task represent the shape shift images from the training dataset. (b) Texture-Shifted Task represent the texture shift images from the training dataset.

(a) Faulty Results on *Document* Retrieval Task (b) Faulty Results on *Cars with Snow* Retrieval Task

Figure 3. Samples that are incorrectly retrieved per task. (a) When an experiment with the zero-shot retrieval with *Document class*, the samples were taken from the night time, or very local images of the car were incorrectly retrieved. (b) The *Cars with snow* class erroneously retrieved the images that include snows at the bottom of the images or the clean cars.