

Exploring Rejection Strategies for Zero-Shot Classification

CIFAR-10

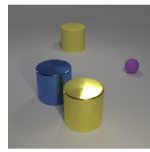
bird (40.9%) Ranked 1 out of 10 labels



- a photo of a bird.
- a photo of a cat.
- a photo of a deer.
- a photo of a frog.
- a photo of a dog.

CLEVR COUNT

4 (171%) Ranked 2 out of 8



- a photo of 3 objects.
- a photo of 4 objects.
- a photo of 5 objects.
- a photo of 6 objects.
- a photo of 10 objects.

FACIAL EMOTION RECOGNITION 2013 (FER2013)

angry (8.2%) Ranked 5 out of 7



- a photo of a happy looking face.
- a photo of a neutral looking face.
- a photo of a surprised looking face.
- a photo of a fearful looking face.
- a photo of an angry looking face.

UCF101

Volleyball Spiking (99.3%) Ranked 1 out of 101



- a photo of a person volleyball spiking.
- a photo of a person jump rope.
- a photo of a person long jump.
- a photo of a person soccer penalty.
- a photo of a person table tennis shot.

<https://blog.csdn.net/g110111>

Zero-shot learning is a challenging task that requires models to classify samples that belong to classes unseen during training. State-of-the-art contrastive learning models such as CLIP have shown impressive performance in image-text classification, but they still struggle with handling out-of-distribution samples.

In this project, we aim to explore state-of-the-art rejection strategies in the zero-shot setting for popular models such as CLIP. The objective is to investigate different approaches to reject or abstain from making a classification decision when the model is uncertain or when the input is out-of-distribution. We will first review existing rejection strategies such as uncertainty-based, entropy-based, and margin-based methods. Then, we will experiment with these strategies and compare their performance on standard zero-shot classification benchmarks. Finally, we will propose novel ideas for rejection strategies and evaluate their effectiveness. The ultimate goal is to improve the robustness and reliability of zero-shot classification models, making them more suitable for real-world applications.

References:

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