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AIChallenger2018_zsl

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README.md

# AIChallenger2018_zsl

## adcv Solution

### 赛题简介

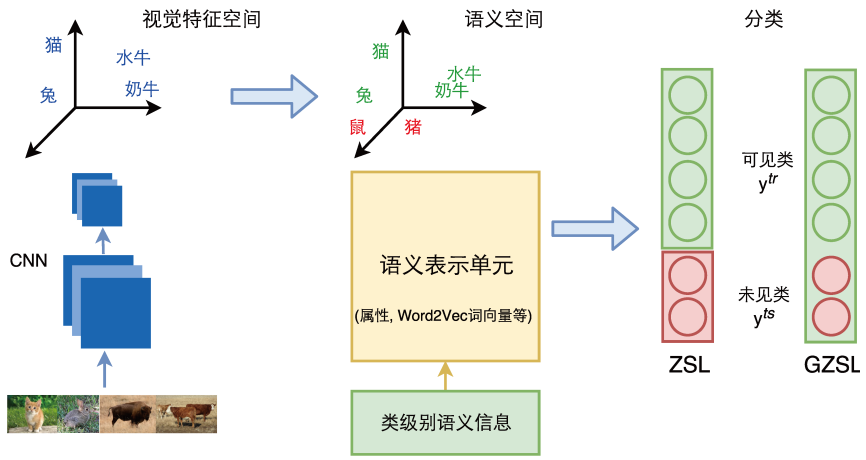
本竞赛由创新工场、北京大学王亦洲教授和复旦大学付彦伟教授联合举办。

本次零样本学习（zero-shot learning）竞赛的任务是在已知类别上训练物体识别模型，要求模型能够用于识别来自未知类别的样本。 本次竞赛提供了属性，用于实现从已知类别到未知类别的知识迁移。要求参赛选手提交对测试样本的标签预测值。

### 数据说明

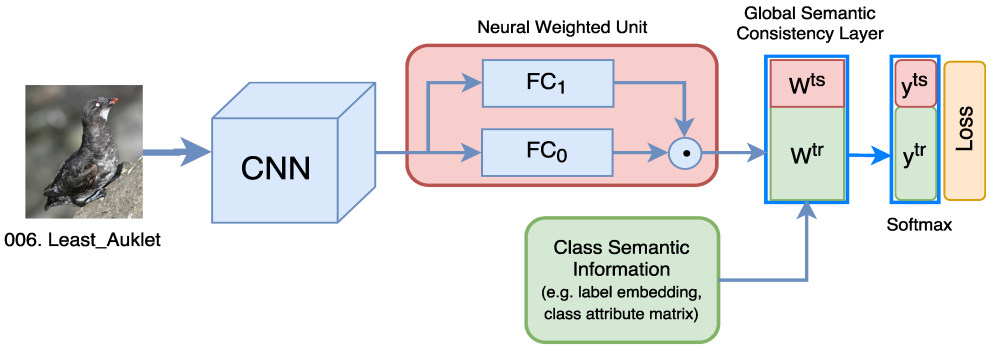
数据集分Test A和Test B两部分。Test A包含动物（Animals）、水果（Fruits）两个超类。Test B包含交通工具（Vehicles）、电子产品（Electronics）、发型（Hairstyles）三个超类。对于每个超类均包含训练集（80%类别）和测试集（20%类别）。训练集所有图片均标注了标签和包围框。对于部分图片（20张/类），标注了二值属性，属性值为0 或 1，表示属性"存在"或"不存在"。对于测试集中的未知类别，仅提供类别级的属性用作知识迁移。

### 零样本学习ZSL示意图

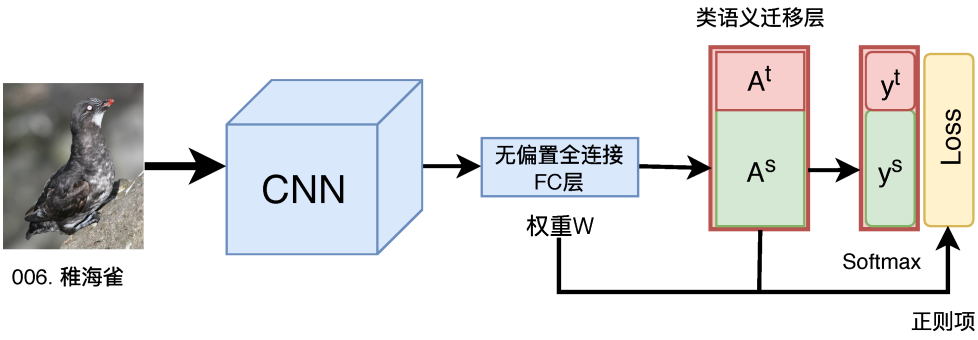



### adcv 方案介绍

1. Global Semantic Consistency Network (GSC-Net)

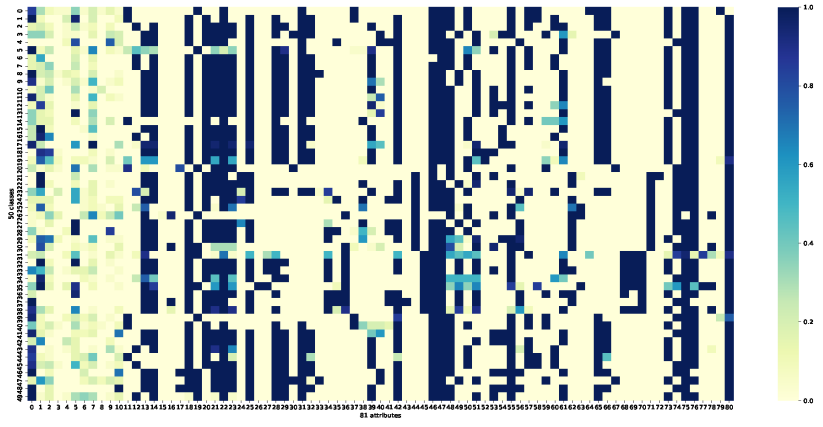



2. Attribute Balancing Network (ABN)

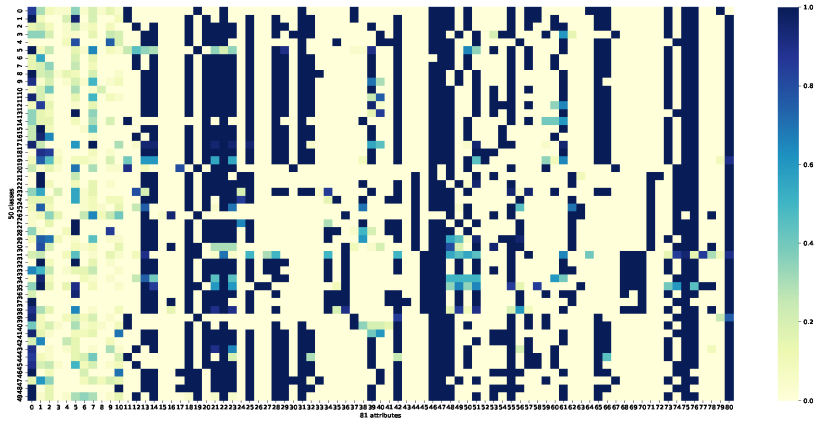



## Data Analysis(class attribute matrix)

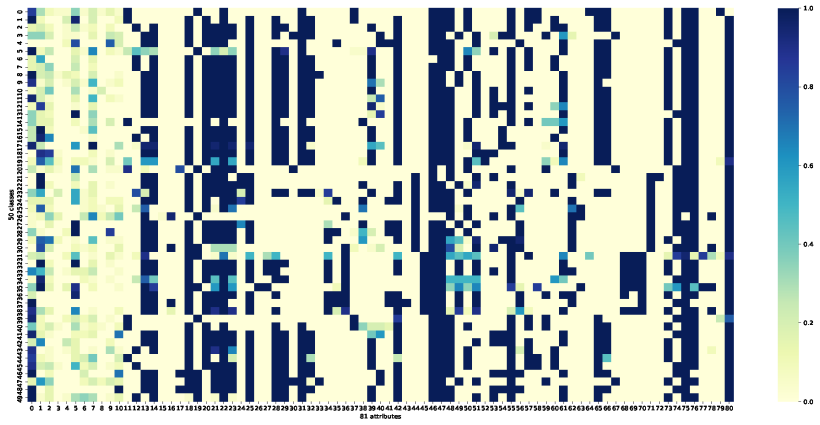
### vehicles



### electronics



### hairstyles



## Code Solution

Take vehicle for example:

1. **Preprocessing**: Set dataset_dir, superclass etc. and dataUtils.py

```
dataset_dir "ai_challenger_zsl2018_test_b_20180423"
superclass = "vehicles"
python utils/dataUtils.py
```

2. **Training**: Set a model and change related lines.

```
GSC-Net: attrWCNNg (Default)
criterion = nn.CrossEntropyLoss()

ABN:  attrWCNNg1 (Set loss = criterion(out, targets, w))
criterion = RegLoss(lamda1=lamda1, lamda2=lamda2, superclass=superclass)

python zsl_train.py
```

1. Train only FC for first 2 epochs.
2. End to end train: Since the competition training images is enough, we simply choose the 3rd epoch checkpoint as our final submission model.

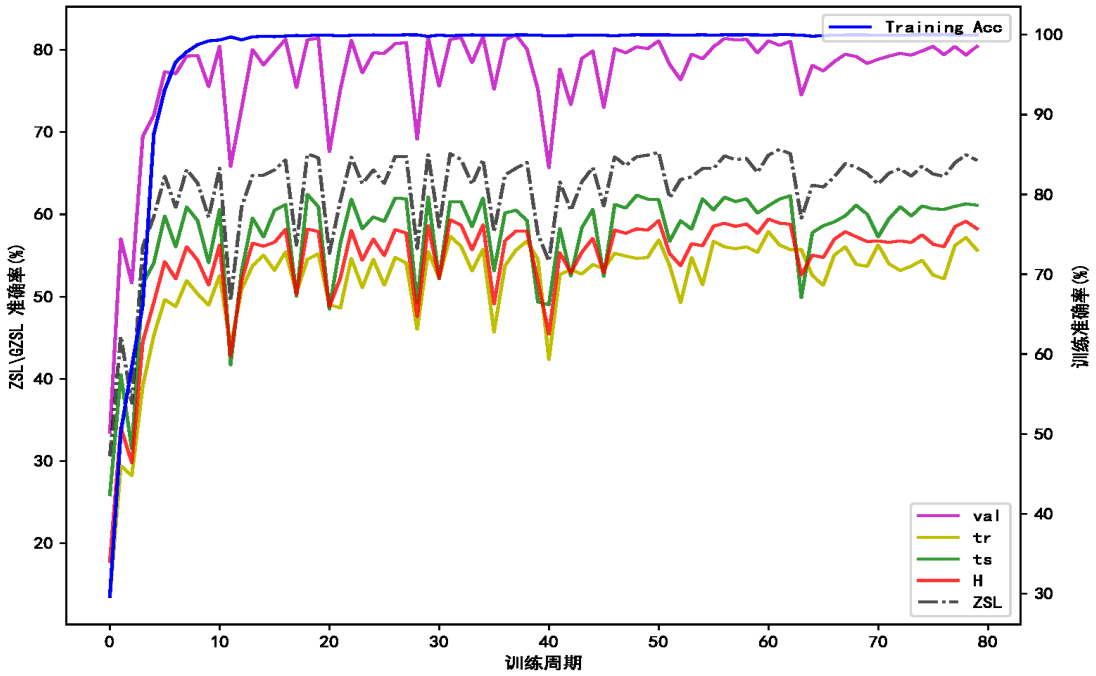
GSC-Net often achieves high in the 3rd epoch. ABN can be stable enough in the first 20 epochs.

3. **Prediction**

```
python pred.py
```

## Results

We evaluate our model in open-access benchmark CUB on both ZSL and GZSL task. Accuracies along with the training are shown below.


Training Acc
val
tr
ts
H
ZSL
ZSL\GZSL 准确率(%)
训练准确率(%)
训练周期
0
10
20
30
40
50
60
70
80
20
30
40
50
60
70
80
30
40
50
60
70
80
90
100