

**题目：**基于 ResNet50 的水果分类

**背景：**使用基于卷积的神经网络 ResNet50 对 30 种水果进行分类

## 任务

1. 划分训练集和验证集
  2. 按照 MMLPreTrain CustomDataset 格式组织训练集和验证集
  3. 使用 MMLPreTrain 算法库，编写配置文件，正确加载预训练模型
  4. 在水果数据集上进行微调训练
  5. 使用 MMLPreTrain 的 ImageClassificationInferencer 接口，对网络水果图像，或自己拍摄的水果图像，使用训练好的模型进行分类
- 需提交的验证集评估指标（不能低于 60%）

- ResNet-50

```
1 Epoch(val) [5][34/34] accuracy/top1: 82.4675 data_time: 0.0038 time: 0.0880
```

## 作业数据集下载：

链接：[https://pan.baidu.com/s/1YgoU1M\\_v7ridtXB9xxbA1Q](https://pan.baidu.com/s/1YgoU1M_v7ridtXB9xxbA1Q)

提取码：52m9

## 课程中猫狗数据集下载地址：

[https://download.openmmlab.com/mmlclassification/dataset/cats\\_dogs\\_dataset.tar](https://download.openmmlab.com/mmlclassification/dataset/cats_dogs_dataset.tar)

## 对数据集进行划分

```
import os

# 获取数据集文件夹路径
CustomDatasetPath = r'D:\workspace\datasets\fruit30_train'
# 获取数据集文件夹下的所有文件
CustomDatasetFile = os.listdir(CustomDatasetPath)
# 如果文件夹中不存在train、val、test文件夹，则创建
dataset_type = ['train', 'val', 'test']
for type in dataset_type:
    if type not in CustomDatasetFile:
        os.mkdir(os.path.join(CustomDatasetPath, type))
    else:
        # 清空文件夹
        os.removedirs(os.path.join(CustomDatasetPath, type))

# 遍历所有文件
for fruit_name in CustomDatasetFile:
```

```

for type in dataset_type:
    os.mkdir(os.path.join(CustomDatasetPath, type, fruit_name))
# 水果文件夹路径
fruit_path = os.path.join(CustomDatasetPath, fruit_name)
# 获取水果文件夹下的所有文件
fruit_file = os.listdir(fruit_path)
# 将水果文件夹下的所有文件分为训练集、验证集、测试集
train_file = fruit_file[:int(len(fruit_file)*0.8)]
val_file = fruit_file[int(len(fruit_file)*0.8):int(len(fruit_file)*0.9)]
test_file = fruit_file[int(len(fruit_file)*0.9):]
# 将训练集、验证集、测试集分别放入对应文件夹
for file in train_file:
    os.rename(os.path.join(fruit_path, file), os.path.join(CustomDatasetPath, 'train',
fruit_name, file))
for file in val_file:
    os.rename(os.path.join(fruit_path, file), os.path.join(CustomDatasetPath, 'val',
fruit_name, file))
for file in test_file:
    os.rename(os.path.join(fruit_path, file), os.path.join(CustomDatasetPath, 'test',
fruit_name, file))
# 删除空文件夹
os.removedirs(fruit_path)

```

## 配置文件

见MMPretrain下resnet50\_8xb32\_in1k\_fruit\_classify.py

## 验证集评估指标

```

06/06 22:26:30 - mmengine - INFO - Epoch(val) [100][55/55]    accuracy/top1: 67.8899
accuracy/top5: 92.8899  data_time: 0.0008  time: 0.0159

```

使用ImageClassificationInferencer 接口进行分类



```

demo
├── bird.JPEG
├── cat-dog.png
├── demo.JPEG
├── dog.jpg
├── image_demo.py
└── ipu_train_example.sh
├── docker
├── docs
├── exp
│   ├── 20230606_203255
│   ├── 20230606_213559
│   └── 20230606_214540
│       ├── 88.jpg
│       ├── 88.png
│       ├── dataset_process.py
│       ├── epoch_25.pth
│       ├── epoch_50.pth
│       ├── epoch_75.pth
│       ├── epoch_100.pth
│       ├── image_classify.py
│       ├── last_checkpoint
│       └── resnet50_8xb32_in1k.py
└── mmpretrain

terminal: Local (2)
"pred_score": 0.0339798741042614

mmtest) PS D:\workspace\mmpretrain> python .\demo\image_demo.py .\exp\88.jpg .\exp\resnet50_8xb32_in1k.py --show-dir .\exp\ --device cuda:0 --checkpoint .\exp\epoch_100.pth
loads checkpoint by local backend from path: .\exp\epoch_100.pth
Inference 100% 0:00.00
0/00 23:11:03 - mmengine - WARNING - 'Visualizer' backend is not initialized because save_dir is None.
.\software\anaconda\envs\mmtest\lib\site-packages\mmengine\visualization\utils.py:240: UserWarning: Glyph 33760 (\{CJK UNIFIED IDEOGRAPH-83E0}) missing from current font.
s, (width, height) = canvas.print_to_buffer()
.\software\anaconda\envs\mmtest\lib\site-packages\mmengine\visualization\utils.py:240: UserWarning: Glyph 33821 (\{CJK UNIFIED IDEOGRAPH-841D}) missing from current font.
s, (width, height) = canvas.print_to_buffer()

"pred_label": 22,
"pred_score": 0.525051057338246,
"pred_class": "菠萝"

```