

# iw05:目标检测APP实验报告

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## 概述

在服务器上、jupyter notebook上，运用gpu训练一个给定的零食目标检测模型，并在App里使用它。

## 实验内容

### 配置环境

该部分分为2小节，即配置程序文件和配置所需要的package。

### 配置文件

由于在服务器上跑程序，需要先将文件传上去。使用scp指令完成以上工作。

```
scp -P 3322 -r /Users/nju/Desktop/task5/Code/iw05-CAR-hash  
ios@114.212.80.19: /home/
```

这部分由于先开始没有搞清楚这指令的用法，在服务器端运行数次，结果发现找不到文件，最后请教老师才回到本地执行。

```
(base) ios@xeon:~$ ls  
iw05-aaaabang iw05-bbzunyi iw05-CAR-hash iw05-yumizhi-master iw05-zcy nohup.out xj
```

### 配置package

创建虚拟环境，并安装对应的包，即turicreate和tensorflow-gpu。其中，anaconda找不到turicreate，故此文件由pip安装，而tensorflow-gpu则由conda直接安装。当然也需要安装jupyter notebook。安装结束后，检查环境中已经有的包。

tensorflow	2.4.1
tensorflow-base	2.4.1
tensorflow-estimator	2.6.0
tensorflow-gpu	2.4.1
termcolor	1.1.0
terminado	0.12.1
testpath	0.5.0
tk	8.6.11
tornado	6.1
tqdm	4.62.3
traitlets	5.1.1
turicreate	6.4.1

符合条件。再在python中测试是否可以用gpu跑模型。

```

Python 3.8.12 (default, Oct 12 2021, 13:49:34)
[GCC 7.5.0] :: Anaconda, Inc. on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import tensorflow as tf
2021-12-28 07:26:01.927750: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcudart.so.10.1
tf>>> tf.test.is_gpu_available()
WARNING:tensorflow:From <stdin>:1: is_gpu_available (from tensorflow.python.framework.test_util) is deprecated and will be removed in a future version.
Instructions for updating:
Use tf.config.list_physical_devices('GPU') instead.
2021-12-28 07:26:13.100270: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library
(oneDNN) to use the following CPU instructions in performance-critical operations: SSE4.1 SSE4.2 AVX AVX2 FMA
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
2021-12-28 07:26:13.196905: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcuda.so.1
2021-12-28 07:26:13.514757: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1720] Found device 0 with properties:
pciBusID: 0000:01:00.0 name: NVIDIA GeForce GTX 1660 computeCapability: 7.5
coreClock: 1.8GHz coreCount: 22 deviceMemorySize: 5.80GiB deviceMemoryBandwidth: 178.86GiB/s
2021-12-28 07:26:13.515388: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1720] Found device 1 with properties:
pciBusID: 0000:02:00.0 name: NVIDIA GeForce GTX 1660 computeCapability: 7.5
coreClock: 1.8GHz coreCount: 22 deviceMemorySize: 5.80GiB deviceMemoryBandwidth: 178.86GiB/s
2021-12-28 07:26:13.515425: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcudart.so.10.1
2021-12-28 07:26:13.517199: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcublas.so.10
2021-12-28 07:26:13.517259: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcublasLt.so.10
2021-12-28 07:26:13.519789: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcufft.so.10
2021-12-28 07:26:13.519081: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcudnn.so.10
2021-12-28 07:26:13.520841: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcusolver.so.10
2021-12-28 07:26:13.521619: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcusparse.so.10
2021-12-28 07:26:13.525328: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcudnn.so.7
2021-12-28 07:26:13.527782: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1862] Adding visible gpu devices: 0, 1
2021-12-28 07:26:13.527827: I tensorflow/stream_executor/platform/default/dso_loader.cc:49] Successfully opened dynamic library libcudart.so.10.1
2021-12-28 07:26:14.462214: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1261] Device interconnect StreamExecutor with strength 1 edge matrix:
2021-12-28 07:26:14.462247: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1267] 0 1
2021-12-28 07:26:14.462257: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1280] 0: N N
2021-12-28 07:26:14.462263: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1280] 1: N N
2021-12-28 07:26:14.464567: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1406] Created TensorFlow device (/device:GPU:0 with 5388 MB memory) -> physic
al GPU (device: 0, name: NVIDIA GeForce GTX 1660, pci bus id: 0000:01:00.0, compute capability: 7.5)
2021-12-28 07:26:14.465918: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1406] Created TensorFlow device (/device:GPU:1 with 5388 MB memory) -> physic
al GPU (device: 1, name: NVIDIA GeForce GTX 1660, pci bus id: 0000:02:00.0, compute capability: 7.5)
2021-12-28 07:26:14.466158: I tensorflow/compiler/jit/xla_gpu_device.cc:99] Not creating XLA devices, tf_xla_enable_xla_devices not set
True
>>>

```

这一部分由于某次断开与服务器的连接时没有退出虚拟环境，导致之后conda activate未能正确地激活虚拟环境——即环境变量的第一位仍是默认环境而不是我创建的虚拟环境，使得pip安装的包仍然是在默认路径，所以花了很长时间在处理无法找到包的问题上。另外开始时没有用conda安装tensorflow-gpu，结果有许多需要的包没有找到，花了一番功夫。

## 代码完善

代码主要在show这个函数里面。首先取出每个prediction，并且在confidence小于一定值时、boundingBoxView数量已达上限时舍弃这个prediction，接着进行坐标转换，最后将boundingBox绘制出来。

```

func show(predictions: [VNRecognizedObjectObservation]) {
    //process the results, call show function in BoundingBoxView
    var i:Int=0
    let screenSize=UIScreen.main.bounds
    var tempBoundingBoxViews:[BoundingBoxView]=[BoundingBoxView]()
    for prediction in predictions {
        if prediction.confidence>0.6{
            DispatchQueue.main.sync {

```

```

        let boundingBox=CGRect(x:
prediction.boundingBox.minX*CGFloat(screenSize.width), y:
prediction.boundingBox.minY*CGFloat(screenSize.height), width:
prediction.boundingBox.width*CGFloat(screenSize.width), height:
prediction.boundingBox.height*CGFloat(screenSize.height))

        self.boundingBoxViews[i].show(frame: boundingBox, label:
prediction.labels[i].identifier+": "+"\"(prediction.confidence)", color:
self.colors[prediction.labels[i].identifier!])
        tempBoundingBoxViews.append(self.boundingBoxViews[i])
        i=i+1
    }
    if i>=10{
        break
    }
}
}
DispatchQueue.main.sync {
    sleep(1)
    for view in tempBoundingBoxViews{
        view.hide()
    }
    tempBoundingBoxViews.removeAll()
}
}

```

## 反思

之前不熟悉python环境、以及conda创建的虚拟环境到底意味着什么，因此面对所遇见的bug无从下手，需要加深对这方面的了解。