NNI进阶项目Training a classifier优化文档

一、运行环境

系统: windows10

环境: Anaconda / Visual Studio Code

PyTorch

导入包:运用pip工具安装numpy,torch,torchvision三个关键包。

```
import argparse
import functools
import logging
import os
import pprint

import numpy as np
import torch
import torch.nn as nn
import torch.nn.functional as F
import torch.optim as optim
import torchvision
import torchvision.models as models
import torchvision.transforms as transforms
```

二、文件说明

主函数文件

- def train(model, loader, criterion, optimizer, scheduler, args, epoch, device) 训练函数
- def test(model, loader, criterion, args, epoch, device) 验证函数
- def main(args): 主要进行三种优化器的选择

yml配置文件

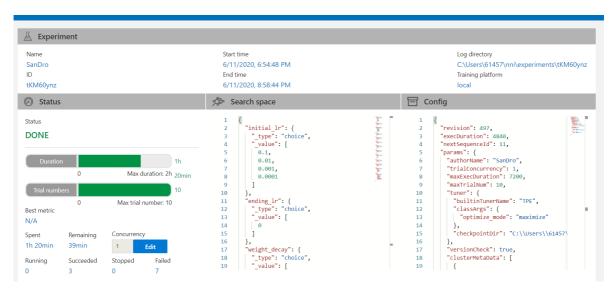
```
authorName: SanDro #作者名
experimentName: SanDro #项目名
```

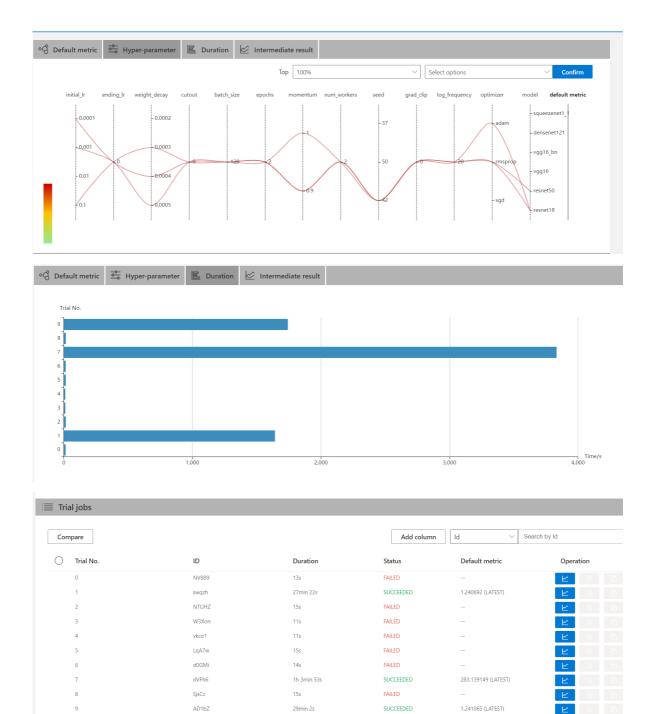
```
trialConcurrency: 1 #同时运行的最大尝试数
maxExecDuration: 24h #最长持续时间
maxTrialNum: 10 #最大尝试次数
trainingServicePlatform: local #本地训练,可选local, remote, pai
searchSpacePath: search_space.json #搜索空间文件
useAnnotation: false #是否允许注释方式配置搜索空间,可选true, false
tuner: #调节器选项
    #SMAC (SMAC should be installed through nnictl)
builtinTunerName: TPE
classArgs: #调节器算法参数
    optimize_mode: maximize
trial: #尝试选项
    command: python main.py
codeDir: .
gpuNum: 0
```

json搜索空间文件

```
"initial_lr":{"_type":"choice", "_value":[0.1, 0.01, 0.001, 0.0001]},
    "ending_lr":{"_type":"choice", "_value":[5e-4, 4e-4, 3e-4, 2e-4]},
    "weight_decay":{"_type":"choice", "_value":[5e-4, 4e-4, 3e-4, 2e-4]},
    "cutout":{"_type":"choice", "_value":[128]},
    "batch_size":{"_type":"choice", "_value":[10]},
    "momentum":{"_type":"choice", "_value":[0.9, 1.0]},
    "num_workers":{"_type":"choice", "_value":[2]},
    "seed":{"_type":"choice", "_value":[2]},
    "grad_clip":{"_type":"choice", "_value":[0]},
    "log_frequency":{"_type":"choice", "_value":[20]},
    "optimizer":{"_type":"choice", "_value":[sgd","rmsprop","adam"]},
    "model":{"_type":"choice", "_value":["sgd","rmsprop","adam"]},
    "model":{"_type":"choice", "_value":["sgd","rmsprop","adam"]}}
}
```

三、运行结果





四、问题与解决方案

进行第一步HPO的时候,在CIFAR10上运用搜索空间选择不同的参数取值,但在尝试多种可选参数取值之后,还是会发生failed的问题,具体报错有不同的原因类似size dismatch等。问题尚未解决。