

NNI学生项目2020

Task 1.1

ID:14 Name:中科大飙车队

任务描述

- 1.安装NNI, 尝试内置样例 (eg.MNIST)
- 2.为选择的样例添加NNI元素
- 3.使用NNI, 自行跑腿程序
- 4.提交NNI集成的结果

样例分析

由于连接服务器需要校园网, 这里的输出文件已截图的形式给出

config.yml

```
1  authorName: default
2  experimentName: mnist
3  #Specifies the max num of trial jobs run simultaneously.
4  trialConcurrency: 3
5  maxExecDuration: 1h
6  maxTrialNum: 10
7  #choice: local, remote, pai
8  # I train the trail on the local of the server.
9  trainingServicePlatform: local
10 # the path of the SearchSpace file
11 searchSpacePath: search_space.json
12 #choice: true, false
13
14 #enable NNI API mode.If it is true,we can run standalone mode under the
   code directory with code "python mnist.py",the trail code could
   successfully run with the default hyperparameter value and we can debug the
   code in the mode.
15 useAnnotation: false
16 tuner:
17     #choice: TPE, Random, Anneal, Evolution, BatchTuner, MetisTuner, GPTuner
18     #SMAC (SMAC should be installed through nnictl)
19     # using Tree-structured Parzen Estimator sequential model-based
   optimization (SMBO) approach to search.
20     builtinTunerName: TPE
21     classArgs:
22         #choice: maximize, minimize
23         optimize_mode: maximize
24 trial:
25     command: python mnist.py
26     codeDir: .
27     gpuNum: 1
28
29 # Used to specify whether to use a GPU if there is another process
30 localConfig:
```

```
31 useActiveGpu: True
32
```

search_space.json

参数的搜索空间，在实现当中通过这几行代码进行更新搜索

```
1 tuner_params = nni.get_next_parameter()
2 params = vars(get_params())
3 params.update(tuner_params)
```

mnist.py

该文件通过简单的卷积网络模型来进行MNIST数据集上的训练,以下为debug下一组参数的训练过程

```
1 {'data_dir': './input_data', 'batch_size': 64, 'batch_num': None,
  'hidden_size': 512, 'lr': 0.01, 'momentum': 0.5, 'epochs': 10, 'seed': 1,
  'no_cuda': False, 'log_interval': 1000}
2 [05/10/2020, 06:32:18 PM] INFO (nni) Intermediate result: 97.45 (Index 0)
3 [05/10/2020, 06:33:10 PM] INFO (nni) Intermediate result: 98.15 (Index 1)
4 [05/10/2020, 06:34:01 PM] INFO (nni) Intermediate result: 98.5 (Index 2)
5 [05/10/2020, 06:34:54 PM] INFO (nni) Intermediate result: 98.33 (Index 3)
6 [05/10/2020, 06:35:46 PM] INFO (nni) Intermediate result: 98.68 (Index 4)
7 [05/10/2020, 06:36:39 PM] INFO (nni) Intermediate result: 98.73 (Index 5)
8 [05/10/2020, 06:37:29 PM] INFO (nni) Intermediate result: 98.94 (Index 6)
9 [05/10/2020, 06:38:19 PM] INFO (nni) Intermediate result: 98.76
  (Index[05/10/2020, 06:39:08 PM] INFO (nni) Intermediate result: 99.03
  (Index 8)
10 [05/10/2020, 06:39:57 PM] INFO (nni) Intermediate result: 99.05 (Index 9)
11 [05/10/2020, 06:39:57 PM] INFO (nni) Final result: 99.05
```

实现

log/nnimanager.log

```
[5/8/2020, 12:19:50 PM] INFO [ 'Datastore initialization done' ]
[5/8/2020, 12:19:50 PM] INFO [ 'RestServer start' ]
[5/8/2020, 12:19:50 PM] INFO [ 'Construct local machine training service.' ]
[5/8/2020, 12:19:50 PM] INFO [ 'RestServer base port is 8080' ]
[5/8/2020, 12:19:50 PM] INFO [ 'Rest server listening on: http://0.0.0.0:8080' ]
[5/8/2020, 12:19:52 PM] INFO [ 'NNIManager setClusterMetadata, key: local_config, value: {'useActiveGpu':true}' ]
[5/8/2020, 12:19:52 PM] INFO [ 'Specified GPU indices: undefined' ]
[5/8/2020, 12:19:52 PM] INFO [ 'NNIManager setClusterMetadata, key: trial_config, value: {'command':'python3 mnist.py','codeDir':'/home/zhxn/mnist/.',
'gpuNum':1}' ]
[5/8/2020, 12:19:52 PM] INFO [ 'required GPU number is 1' ]
[5/8/2020, 12:19:52 PM] INFO [ 'Starting experiment: seuA05Xj' ]
[5/8/2020, 12:19:52 PM] INFO [ 'Change NNIManager status from: INITIALIZED to: RUNNING' ]
[5/8/2020, 12:19:52 PM] INFO [ 'Add event listeners' ]
[5/8/2020, 12:19:52 PM] INFO [ 'Run local machine training service.' ]
[5/8/2020, 12:19:53 PM] INFO [ 'NNIManager received command from dispatcher: ID, ' ]
[5/8/2020, 12:19:53 PM] INFO [ 'NNIManager received command from dispatcher: TR, {'parameter_id': 0, 'parameter_source': 'algorithm', 'parameters': {'
batch_size': 64, 'hidden_size': 512, 'lr': 0.001, 'momentum': 0.47600902184972926}, 'parameter_index': 0}' ]
[5/8/2020, 12:19:57 PM] INFO [ 'submitTrialJob: form: {'sequenceId':1,'hyperParameters':{'value':{'parameter_id\\': 0, 'parameter_source\\': '\\a
lgorithm\\', 'parameters\\': {'batch_size\\': 64, 'hidden_size\\': 512, 'lr\\': 0.001, 'momentum\\': 0.47600902184972926}, 'parameter_inde
x\\': 0}, 'index':0}}' ]
[5/8/2020, 12:20:03 PM] INFO [ 'Trial job kPssu status changed from WAITING to RUNNING' ]
[5/8/2020, 12:21:33 PM] INFO [ 'Trial job kPssu status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:21:33 PM] INFO [ 'NNIManager received command from dispatcher: TR, {'parameter_id': 1, 'parameter_source': 'algorithm', 'parameters': {'
batch_size': 128, 'hidden_size': 512, 'lr': 0.01, 'momentum': 0.41862938632081725}, 'parameter_index': 0}' ]
[5/8/2020, 12:21:38 PM] INFO [ 'submitTrialJob: form: {'sequenceId':1,'hyperParameters':{'value':{'parameter_id\\': 1, 'parameter_source\\': '\\a
lgorithm\\', 'parameters\\': {'batch_size\\': 128, 'hidden_size\\': 512, 'lr\\': 0.01, 'momentum\\': 0.41862938632081725}, 'parameter_inde
x\\': 0}, 'index':0}}' ]
[5/8/2020, 12:21:43 PM] INFO [ 'Trial job uMzFu status changed from WAITING to RUNNING' ]
[5/8/2020, 12:23:03 PM] INFO [ 'Trial job uMzFu status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:23:03 PM] INFO [ 'NNIManager received command from dispatcher: TR, {'parameter_id': 2, 'parameter_source': 'algorithm', 'parameters': {'
batch_size': 16, 'hidden_size': 1024, 'lr': 0.0001, 'momentum': 0.22183617734629857}, 'parameter_index': 0}' ]
[5/8/2020, 12:23:08 PM] INFO [ 'submitTrialJob: form: {'sequenceId':2,'hyperParameters':{'value':{'parameter_id\\': 2, 'parameter_source\\': '\\a
lgorithm\\', 'parameters\\': {'batch_size\\': 16, 'hidden_size\\': 1024, 'lr\\': 0.0001, 'momentum\\': 0.22183617734629857}, 'parameter_inde
x\\': 0}, 'index':0}}' ]
```

```

logrithm\\", "\\parameters\\": {\\\"batch_size\\\": 16, \\\"hidden_size\\\": 1024, \\\"lr\\\": 0.0001, \\\"momentum\\\": 0.22183617734629857}, \\\"parameter_index\\\": 0}, \"index\":0}']
[5/8/2020, 12:23:13 PM] INFO [ 'Trial job BxfaA status changed from WAITING to RUNNING' ]
[5/8/2020, 12:25:53 PM] INFO [ 'Trial job BxfaA status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:25:53 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 3, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 128, \"hidden_size\": 1024, \"lr\": 0.1, \"momentum\": 0.17294076425487004}, \"parameter_index\": 0}' ]
[5/8/2020, 12:25:58 PM] INFO [ 'submitTrialJob: form: {\"sequenceId\":3,\"hyperParameters\":{\"value\":{\"\\\"parameter_id\\\": 3, \\\"parameter_source\\\": \\\"algorithm\\\", \\\"parameters\\\": {\\\"batch_size\\\": 128, \\\"hidden_size\\\": 1024, \\\"lr\\\": 0.1, \\\"momentum\\\": 0.17294076425487004}, \\\"parameter_index\\\": 0}}, \"index\":0}' ]
[5/8/2020, 12:26:03 PM] INFO [ 'Trial job DGikt status changed from WAITING to RUNNING' ]
[5/8/2020, 12:27:43 PM] INFO [ 'Trial job DGikt status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:27:43 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 4, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 16, \"hidden_size\": 1024, \"lr\": 0.001, \"momentum\": 0.1161980891557497}, \"parameter_index\": 0}' ]
[5/8/2020, 12:27:48 PM] INFO [ 'submitTrialJob: form: {\"sequenceId\":4,\"hyperParameters\":{\"value\":{\"\\\"parameter_id\\\": 4, \\\"parameter_source\\\": \\\"algorithm\\\", \\\"parameters\\\": {\\\"batch_size\\\": 16, \\\"hidden_size\\\": 1024, \\\"lr\\\": 0.001, \\\"momentum\\\": 0.1161980891557497}, \\\"parameter_index\\\": 0}}, \"index\":0}' ]
[5/8/2020, 12:27:53 PM] INFO [ 'Trial job OI2zP status changed from WAITING to RUNNING' ]
[5/8/2020, 12:30:59 PM] INFO [ 'Trial job OI2zP status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:30:59 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 5, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 16, \"hidden_size\": 512, \"lr\": 0.001, \"momentum\": 0.37509112395982513}, \"parameter_index\": 0}' ]
[5/8/2020, 12:31:04 PM] INFO [ 'submitTrialJob: form: {\"sequenceId\":5,\"hyperParameters\":{\"value\":{\"\\\"parameter_id\\\": 5, \\\"parameter_source\\\": \\\"algorithm\\\", \\\"parameters\\\": {\\\"batch_size\\\": 16, \\\"hidden_size\\\": 512, \\\"lr\\\": 0.001, \\\"momentum\\\": 0.37509112395982513}, \\\"parameter_index\\\": 0}}, \"index\":0}' ]
[5/8/2020, 12:31:09 PM] INFO [ 'Trial job xJirM status changed from WAITING to RUNNING' ]
[5/8/2020, 12:34:14 PM] INFO [ 'Trial job xJirM status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:34:14 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 6, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 16, \"hidden_size\": 1024, \"lr\": 0.001, \"momentum\": 0.6237224985130745}, \"parameter_index\": 0}' ]
[5/8/2020, 12:34:19 PM] INFO [ 'submitTrialJob: form: {\"sequenceId\":6,\"hyperParameters\":{\"value\":{\"\\\"parameter_id\\\": 6, \\\"parameter_source\\\": \\\"algorithm\\\", \\\"parameters\\\": {\\\"batch_size\\\": 16, \\\"hidden_size\\\": 1024, \\\"lr\\\": 0.001, \\\"momentum\\\": 0.6237224985130745}, \\\"parameter_index\\\": 0}}, \"index\":0}' ]
[5/8/2020, 12:34:24 PM] INFO [ 'Trial job Zmo3v status changed from WAITING to RUNNING' ]
[5/8/2020, 12:37:30 PM] INFO [ 'Trial job Zmo3v status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:37:30 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 7, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 32, \"hidden_size\": 512, \"lr\": 0.1, \"momentum\": 0.19367592915778664}, \"parameter_index\": 0}' ]
[5/8/2020, 12:37:30 PM] INFO [ 'Trial job Zmo3v status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:37:30 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 7, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 32, \"hidden_size\": 512, \"lr\": 0.1, \"momentum\": 0.19367592915778664}, \"parameter_index\": 0}' ]
[5/8/2020, 12:37:35 PM] INFO [ 'submitTrialJob: form: {\"sequenceId\":7,\"hyperParameters\":{\"value\":{\"\\\"parameter_id\\\": 7, \\\"parameter_source\\\": \\\"algorithm\\\", \\\"parameters\\\": {\\\"batch_size\\\": 32, \\\"hidden_size\\\": 512, \\\"lr\\\": 0.1, \\\"momentum\\\": 0.19367592915778664}, \\\"parameter_index\\\": 0}}, \"index\":0}' ]
[5/8/2020, 12:37:40 PM] INFO [ 'Trial job R8lHQ status changed from WAITING to RUNNING' ]
[5/8/2020, 12:39:55 PM] INFO [ 'Trial job R8lHQ status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:39:55 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 8, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 16, \"hidden_size\": 1024, \"lr\": 0.0001, \"momentum\": 0.6426747483948231}, \"parameter_index\": 0}' ]
[5/8/2020, 12:40:00 PM] INFO [ 'submitTrialJob: form: {\"sequenceId\":8,\"hyperParameters\":{\"value\":{\"\\\"parameter_id\\\": 8, \\\"parameter_source\\\": \\\"algorithm\\\", \\\"parameters\\\": {\\\"batch_size\\\": 16, \\\"hidden_size\\\": 1024, \\\"lr\\\": 0.0001, \\\"momentum\\\": 0.6426747483948231}, \\\"parameter_index\\\": 0}}, \"index\":0}' ]
[5/8/2020, 12:40:05 PM] INFO [ 'Trial job hBoD9 status changed from WAITING to RUNNING' ]
[5/8/2020, 12:43:10 PM] INFO [ 'Trial job hBoD9 status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:43:11 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 9, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 16, \"hidden_size\": 256, \"lr\": 0.1, \"momentum\": 0.8965852474362469}, \"parameter_index\": 0}' ]
[5/8/2020, 12:43:16 PM] INFO [ 'submitTrialJob: form: {\"sequenceId\":9,\"hyperParameters\":{\"value\":{\"\\\"parameter_id\\\": 9, \\\"parameter_source\\\": \\\"algorithm\\\", \\\"parameters\\\": {\\\"batch_size\\\": 16, \\\"hidden_size\\\": 256, \\\"lr\\\": 0.1, \\\"momentum\\\": 0.8965852474362469}, \\\"parameter_index\\\": 0}}, \"index\":0}' ]
[5/8/2020, 12:43:21 PM] INFO [ 'Trial job SyqJ0 status changed from WAITING to RUNNING' ]
[5/8/2020, 12:43:21 PM] INFO [ 'Change NNIManager status from: RUNNING to: NO_MORE TRIAL' ]
[5/8/2020, 12:46:21 PM] INFO [ 'Trial job SyqJ0 status changed from RUNNING to SUCCEEDED' ]
[5/8/2020, 12:46:21 PM] INFO [ 'Change NNIManager status from: NO_MORE TRIAL to: DONE' ]
[5/8/2020, 12:46:21 PM] INFO [ 'NNIManager received command from dispatcher: TR, {\"parameter_id\": 10, \"parameter_source\": \"algorithm\", \"parameters\": {\"batch_size\": 16, \"hidden_size\": 512, \"lr\": 0.1, \"momentum\": 0.9442208147081209}, \"parameter_index\": 0}' ]
[5/8/2020, 12:46:21 PM] INFO [ 'Experiment done.' ]
[5/8/2020, 12:49:46 PM] INFO [ 'Change NNIManager status from: DONE to STOPPING' ]
[5/8/2020, 12:49:46 PM] INFO [ 'Stopping experiment, cleaning up ...' ]
[5/8/2020, 12:49:50 PM] INFO [ 'Stopping local machine training service...' ]
[5/8/2020, 12:49:50 PM] ERROR [ 'GPU scheduler error: ChildProcessError: Command failed: pkill -P 3587\\n\\n `pkill -P 3587\\n` (exited with error code 1)' ]
[5/8/2020, 12:49:50 PM] INFO [ 'Change NNIManager status from: STOPPING to: STOPPED' ]
[5/8/2020, 12:49:50 PM] INFO [ 'Experiment stopped.' ]

```

log/dispatcher.log

```

[05/08/2020, 12:19:53 PM] INFO (hyperopt.utils/MainThread) Failed to load dill, try installing dill via "pip install dill" for enhanced pickling support.
[05/08/2020, 12:19:53 PM] INFO (hyperopt.fmin/MainThread) Failed to load dill, try installing dill via "pip install dill" for enhanced pickling support.
[05/08/2020, 12:19:53 PM] INFO (nni.msg_dispatcher_base/MainThread) Start dispatcher
[05/08/2020, 12:19:53 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.003303 seconds
[05/08/2020, 12:19:53 PM] INFO (hyperopt.tpe/Thread-1) TPE using 0 trials
[05/08/2020, 12:21:33 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.003448 seconds
[05/08/2020, 12:21:33 PM] INFO (hyperopt.tpe/Thread-1) TPE using 1/1 trials with best loss -97.390000
[05/08/2020, 12:23:03 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.002230 seconds
[05/08/2020, 12:23:03 PM] INFO (hyperopt.tpe/Thread-1) TPE using 2/2 trials with best loss -98.710000
[05/08/2020, 12:25:53 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.002574 seconds
[05/08/2020, 12:25:53 PM] INFO (hyperopt.tpe/Thread-1) TPE using 3/3 trials with best loss -98.710000
[05/08/2020, 12:27:43 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.003938 seconds
[05/08/2020, 12:27:43 PM] INFO (hyperopt.tpe/Thread-1) TPE using 4/4 trials with best loss -99.230000
[05/08/2020, 12:30:59 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.002252 seconds
[05/08/2020, 12:30:59 PM] INFO (hyperopt.tpe/Thread-1) TPE using 5/5 trials with best loss -99.230000
[05/08/2020, 12:34:14 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.003871 seconds
[05/08/2020, 12:34:14 PM] INFO (hyperopt.tpe/Thread-1) TPE using 6/6 trials with best loss -99.230000
[05/08/2020, 12:37:30 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.002284 seconds
[05/08/2020, 12:37:30 PM] INFO (hyperopt.tpe/Thread-1) TPE using 7/7 trials with best loss -99.230000
[05/08/2020, 12:39:55 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.003635 seconds
[05/08/2020, 12:39:55 PM] INFO (hyperopt.tpe/Thread-1) TPE using 8/8 trials with best loss -99.300000
[05/08/2020, 12:43:11 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.003309 seconds
[05/08/2020, 12:43:11 PM] INFO (hyperopt.tpe/Thread-1) TPE using 9/9 trials with best loss -99.300000
[05/08/2020, 12:46:21 PM] INFO (hyperopt.tpe/Thread-1) tpe_transform took 0.005080 seconds
[05/08/2020, 12:46:21 PM] INFO (hyperopt.tpe/Thread-1) TPE using 10/10 trials with best loss -99.300000
[05/08/2020, 12:49:46 PM] INFO (nni.msg_dispatcher_base/MainThread) Dispatcher exiting...
[05/08/2020, 12:49:49 PM] INFO (nni.msg_dispatcher_base/MainThread) Terminated by NNI manager

```

选取trials中的一个进行截图

```
(base) zhxn@user:~/nni/experiments/seuA05Xj/trials/BxfA$ cat parameter.cfg
{"parameter_id": 2, "parameter_source": "algorithm", "parameters": {"batch_size": 16, "hidden_size": 1024, "lr": 0.001, "momentum": 0.22183617734629857}, "parameter_index": 0}(base) zhxn@user:~/nni/experiments/seuA05Xj/trials/BxfA$ cat stderr
(base) zhxn@user:~/nni/experiments/seuA05Xj/trials/BxfA$ cat trial.log
[05/08/2020, 12:23:13 PM] PRINT {"data_dir": "/input_data", "batch_size": 16, "batch_num": None, "hidden_size": 1024, "lr": 0.001, "momentum": 0.22183617734629857, "epochs": 10, "seed": 1, "no_cuda": False, "log_interval": 1000}
[05/08/2020, 12:23:17 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 1 [0/60000 (0%)] Loss: 2.286863
[05/08/2020, 12:23:21 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 1 [16000/60000 (27%)] Loss: 2.256904
[05/08/2020, 12:23:24 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 1 [32000/60000 (53%)] Loss: 2.167577
[05/08/2020, 12:23:28 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 1 [48000/60000 (80%)] Loss: 2.076106
[05/08/2020, 12:23:32 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 1.9918, Accuracy: 6931/10000 (69%)

[05/08/2020, 12:23:33 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 2 [0/60000 (0%)] Loss: 2.002261
[05/08/2020, 12:23:36 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 2 [16000/60000 (27%)] Loss: 1.933257
[05/08/2020, 12:23:40 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 2 [32000/60000 (53%)] Loss: 1.480607
[05/08/2020, 12:23:44 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 2 [48000/60000 (80%)] Loss: 1.372217
[05/08/2020, 12:23:48 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 1.0369, Accuracy: 8096/10000 (81%)

[05/08/2020, 12:23:48 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 3 [0/60000 (0%)] Loss: 1.284232
[05/08/2020, 12:23:52 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 3 [16000/60000 (27%)] Loss: 1.012142
[05/08/2020, 12:23:55 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 3 [32000/60000 (53%)] Loss: 0.676984
[05/08/2020, 12:23:59 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 3 [48000/60000 (80%)] Loss: 0.409085
[05/08/2020, 12:24:03 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 0.5477, Accuracy: 8619/10000 (86%)

[05/08/2020, 12:24:03 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 4 [0/60000 (0%)] Loss: 0.345120
[05/08/2020, 12:24:07 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 4 [16000/60000 (27%)] Loss: 0.458079
[05/08/2020, 12:24:11 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 4 [32000/60000 (53%)] Loss: 0.481918
[05/08/2020, 12:24:14 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 4 [48000/60000 (80%)] Loss: 0.212837
[05/08/2020, 12:24:19 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 0.4192, Accuracy: 8831/10000 (88%)
```

```
[05/08/2020, 12:24:19 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 5 [0/60000 (0%)] Loss: 0.547614
[05/08/2020, 12:24:22 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 5 [16000/60000 (27%)] Loss: 0.397873
[05/08/2020, 12:24:26 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 5 [32000/60000 (53%)] Loss: 1.043149
[05/08/2020, 12:24:30 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 5 [48000/60000 (80%)] Loss: 0.621004
[05/08/2020, 12:24:34 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 0.3589, Accuracy: 8965/10000 (90%)

[05/08/2020, 12:24:34 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 6 [0/60000 (0%)] Loss: 0.712138
[05/08/2020, 12:24:38 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 6 [16000/60000 (27%)] Loss: 0.283405
[05/08/2020, 12:24:42 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 6 [32000/60000 (53%)] Loss: 0.658347
[05/08/2020, 12:24:45 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 6 [48000/60000 (80%)] Loss: 0.903830
[05/08/2020, 12:24:50 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 0.3228, Accuracy: 9074/10000 (91%)

[05/08/2020, 12:24:50 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 7 [0/60000 (0%)] Loss: 0.610207
[05/08/2020, 12:24:53 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 7 [16000/60000 (27%)] Loss: 0.283797
[05/08/2020, 12:24:57 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 7 [32000/60000 (53%)] Loss: 0.235501
[05/08/2020, 12:25:01 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 7 [48000/60000 (80%)] Loss: 0.234837
[05/08/2020, 12:25:05 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 0.2957, Accuracy: 9128/10000 (91%)

[05/08/2020, 12:25:05 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 8 [0/60000 (0%)] Loss: 0.207391
[05/08/2020, 12:25:09 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 8 [16000/60000 (27%)] Loss: 0.436915
[05/08/2020, 12:25:12 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 8 [32000/60000 (53%)] Loss: 0.237173
[05/08/2020, 12:25:16 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 8 [48000/60000 (80%)] Loss: 0.177366
[05/08/2020, 12:25:20 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 0.2713, Accuracy: 9218/10000 (92%)

[05/08/2020, 12:25:20 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 9 [0/60000 (0%)] Loss: 0.058160
[05/08/2020, 12:25:24 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 9 [16000/60000 (27%)] Loss: 0.324164
[05/08/2020, 12:25:27 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 9 [32000/60000 (53%)] Loss: 0.263172
```

```
[05/08/2020, 12:25:20 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 9 [0/60000 (0%)] Loss: 0.058160
[05/08/2020, 12:25:24 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 9 [16000/60000 (27%)] Loss: 0.324164
[05/08/2020, 12:25:27 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 9 [32000/60000 (53%)] Loss: 0.263172
[05/08/2020, 12:25:31 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 9 [48000/60000 (80%)] Loss: 0.243702
[05/08/2020, 12:25:35 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 0.2520, Accuracy: 9268/10000 (93%)

[05/08/2020, 12:25:35 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 10 [0/60000 (0%)] Loss: 0.427373
[05/08/2020, 12:25:39 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 10 [16000/60000 (27%)] Loss: 0.181409
[05/08/2020, 12:25:43 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 10 [32000/60000 (53%)] Loss: 0.461912
[05/08/2020, 12:25:46 PM] INFO (mnist_AutoML/MainThread) Train Epoch: 10 [48000/60000 (80%)] Loss: 0.180903
[05/08/2020, 12:25:51 PM] INFO (mnist_AutoML/MainThread)
Test set: Average loss: 0.2364, Accuracy: 9327/10000 (93%)
```

结果分析

可以从nni/log/nnimanager.log 文件中看出nni运行的过程，每个trial最优loss可以从log/dispatcher.log看到， trial8,9,10的准确率都达到了99。