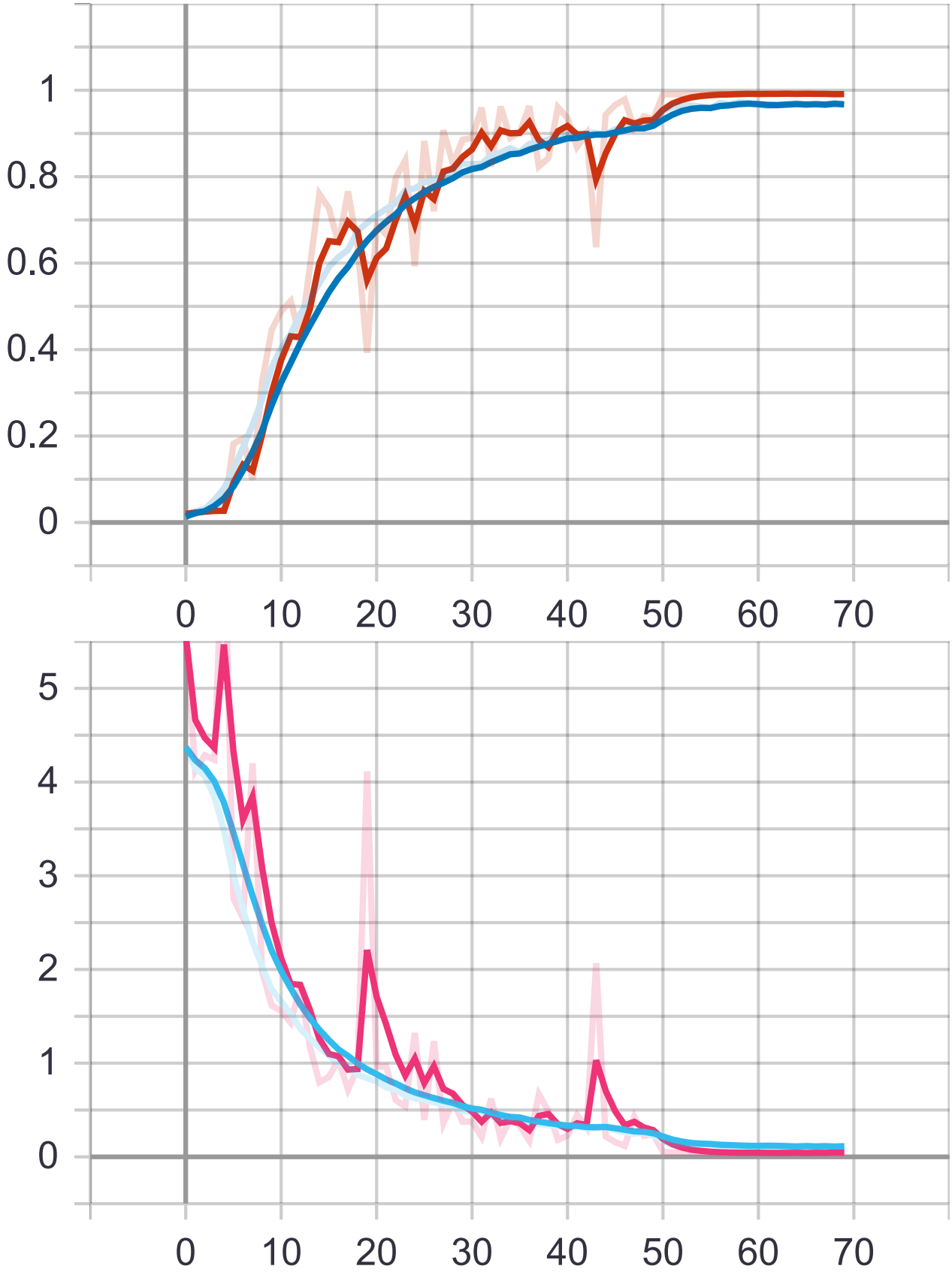
1. 数据目录结构

```
[1-92]                                  # 人员标签
    ├── multi/                          # 多光谱
    │   └── illum[1-3]/, normal/        # 干扰 `1-3`，无干扰
    │       ├── Multi_[1-7]_W1_1/       # 位置 `1-7`          无眼镜       每个位置目录下包括四个照片目录
    │       │   └── [1-4]/              #                                  每个目录下包括25张图片文件
    │       │       └── [1-25].jpg
    │       ├── Multi_4_W1_6            # 位置 `4`            墨镜         目录下包括四个照片目录
    │       │   └── [1-4]/              #                                  每个目录下包括25张图片文件
    │       │       └── [1-25].jpg
    │       └── Multi_[1-7]_W1_5        # 位置 `1-7`          眼镜         每个目录下包括25张图片文件， 部分人员无眼镜，即无该目录
    │           └── [1-25].jpg
    └── rgb                             # 可见光
        └── illum[1-3]/, normal/        # 干扰 `1-3`，无干扰
            ├── RGB_[1-7]_W1_1/         # 位置 `1-7`          无眼镜       每个位置目录下包括四张照片文件
            │   └── [1-4].jpg
            ├── RGB_4_W1_6/             # 位置 `4`            墨镜         目录下包括四张照片文件
            │   └── [1-4].jpg
            └── RGB_[1-7]_W1_5.jpg      # 位置 `1-7`          眼镜         部分人员无眼镜，即无该图片
```

2. 实验

首先进行试验，确定合适的`configer`参数，在此基础上进行实验，在配置文件`config.py`中保存的参数下，获得良好的实验结果



3.1 划分比例的确定

> 确定在何种划分下进行实验，后续实验均以此结果为标准。

- 划分方式与上阶段一致，在每人的数据中，保留`Multi`与`RGB`同时检测出的图片路径，打乱后按一定比例划分；
- 本次实验划分时不做特殊处理，若需要其中指定条件的数据，可在`RecognizeDataset`中指定筛选条件`condition`；

运行

```
python gen_split.py

[split_112x96_[0.10:0.70:0.20]_[1]] n_items: 12227, n_train: 1160, n_valid: 8516, n_test: 2551, ratio: 0.095: 0.696:
```

```
0.209
[split_112x96_[0.10:0.70:0.20]_[2]] n_items: 12227, n_train: 1160, n_valid: 8516, n_test: 2551, ratio: 0.095: 0.696:
0.209
[split_112x96_[0.10:0.70:0.20]_[3]] n_items: 12227, n_train: 1160, n_valid: 8516, n_test: 2551, ratio: 0.095: 0.696:
0.209
[split_112x96_[0.10:0.70:0.20]_[4]] n_items: 12227, n_train: 1160, n_valid: 8516, n_test: 2551, ratio: 0.095: 0.696:
0.209
[split_112x96_[0.10:0.70:0.20]_[5]] n_items: 12227, n_train: 1160, n_valid: 8516, n_test: 2551, ratio: 0.095: 0.696:
0.209
[split_112x96_[0.20:0.60:0.20]_[1]] n_items: 12227, n_train: 2407, n_valid: 7280, n_test: 2540, ratio: 0.197: 0.595:
0.208
[split_112x96_[0.20:0.60:0.20]_[2]] n_items: 12227, n_train: 2407, n_valid: 7280, n_test: 2540, ratio: 0.197: 0.595:
0.208
[split_112x96_[0.20:0.60:0.20]_[3]] n_items: 12227, n_train: 2407, n_valid: 7280, n_test: 2540, ratio: 0.197: 0.595:
0.208
[split_112x96_[0.20:0.60:0.20]_[4]] n_items: 12227, n_train: 2407, n_valid: 7280, n_test: 2540, ratio: 0.197: 0.595:
0.208
[split_112x96_[0.20:0.60:0.20]_[5]] n_items: 12227, n_train: 2407, n_valid: 7280, n_test: 2540, ratio: 0.197: 0.595:
0.208
[split_112x96_[0.30:0.50:0.20]_[1]] n_items: 12227, n_train: 3621, n_valid: 6106, n_test: 2500, ratio: 0.296: 0.499:
0.204
[split_112x96_[0.30:0.50:0.20]_[2]] n_items: 12227, n_train: 3621, n_valid: 6106, n_test: 2500, ratio: 0.296: 0.499:
0.204
[split_112x96_[0.30:0.50:0.20]_[3]] n_items: 12227, n_train: 3621, n_valid: 6106, n_test: 2500, ratio: 0.296: 0.499:
0.204
[split_112x96_[0.30:0.50:0.20]_[4]] n_items: 12227, n_train: 3621, n_valid: 6106, n_test: 2500, ratio: 0.296: 0.499:
0.204
[split_112x96_[0.30:0.50:0.20]_[5]] n_items: 12227, n_train: 3621, n_valid: 6106, n_test: 2500, ratio: 0.296: 0.499:
0.204
[split_112x96_[0.40:0.40:0.20]_[1]] n_items: 12227, n_train: 4860, n_valid: 4860, n_test: 2507, ratio: 0.397: 0.397:
0.205
[split_112x96_[0.40:0.40:0.20]_[2]] n_items: 12227, n_train: 4860, n_valid: 4860, n_test: 2507, ratio: 0.397: 0.397:
0.205
[split_112x96_[0.40:0.40:0.20]_[3]] n_items: 12227, n_train: 4860, n_valid: 4860, n_test: 2507, ratio: 0.397: 0.397:
0.205
[split_112x96_[0.40:0.40:0.20]_[4]] n_items: 12227, n_train: 4860, n_valid: 4860, n_test: 2507, ratio: 0.397: 0.397:
0.205
[split_112x96_[0.40:0.40:0.20]_[5]] n_items: 12227, n_train: 4860, n_valid: 4860, n_test: 2507, ratio: 0.397: 0.397:
0.205
[split_112x96_[0.50:0.30:0.20]_[1]] n_items: 12227, n_train: 6106, n_valid: 3621, n_test: 2500, ratio: 0.499: 0.296:
0.204
[split_112x96_[0.50:0.30:0.20]_[2]] n_items: 12227, n_train: 6106, n_valid: 3621, n_test: 2500, ratio: 0.499: 0.296:
0.204
[split_112x96_[0.50:0.30:0.20]_[3]] n_items: 12227, n_train: 6106, n_valid: 3621, n_test: 2500, ratio: 0.499: 0.296:
0.204
[split_112x96_[0.50:0.30:0.20]_[4]] n_items: 12227, n_train: 6106, n_valid: 3621, n_test: 2500, ratio: 0.499: 0.296:
0.204
[split_112x96_[0.50:0.30:0.20]_[5]] n_items: 12227, n_train: 6106, n_valid: 3621, n_test: 2500, ratio: 0.499: 0.296:
0.204
[split_112x96_[0.60:0.20:0.20]_[1]] n_items: 12227, n_train: 7280, n_valid: 2404, n_test: 2543, ratio: 0.595: 0.197:
0.208
[split_112x96_[0.60:0.20:0.20]_[2]] n_items: 12227, n_train: 7280, n_valid: 2404, n_test: 2543, ratio: 0.595: 0.197:
0.208
[split_112x96_[0.60:0.20:0.20]_[3]] n_items: 12227, n_train: 7280, n_valid: 2404, n_test: 2543, ratio: 0.595: 0.197:
0.208
[split_112x96_[0.60:0.20:0.20]_[4]] n_items: 12227, n_train: 7280, n_valid: 2404, n_test: 2543, ratio: 0.595: 0.197:
0.208
[split_112x96_[0.60:0.20:0.20]_[5]] n_items: 12227, n_train: 7280, n_valid: 2404, n_test: 2543, ratio: 0.595: 0.197:
0.208
[split_112x96_[0.70:0.10:0.20]_[1]] n_items: 12227, n_train: 8516, n_valid: 1160, n_test: 2551, ratio: 0.696: 0.095:
0.209
[split_112x96_[0.70:0.10:0.20]_[2]] n_items: 12227, n_train: 8516, n_valid: 1160, n_test: 2551, ratio: 0.696: 0.095:
0.209
[split_112x96_[0.70:0.10:0.20]_[3]] n_items: 12227, n_train: 8516, n_valid: 1160, n_test: 2551, ratio: 0.696: 0.095:
0.209
[split_112x96_[0.70:0.10:0.20]_[4]] n_items: 12227, n_train: 8516, n_valid: 1160, n_test: 2551, ratio: 0.696: 0.095:
0.209
[split_112x96_[0.70:0.10:0.20]_[5]] n_items: 12227, n_train: 8516, n_valid: 1160, n_test: 2551, ratio: 0.696: 0.095:
0.209
```

在当前目录下，生成文件夹`split`，其目录结构如下

```
split
└── split_112x96_[比例]_[划分计数]
    ├── note.txt
    ├── test_Multi.txt
    ├── test_RGB.txt
    ├── train_Multi.txt
    ├── train_RGB.txt
```

```
    ├── valid_Multi.txt
    └── valid_RGB.txt
```

其中比例形式为训练集：验证集：测试集，划分计数为1~5。

- 各比例下进行5次随机划分，依次在比例为以下情况时进行实验；
- 统计各情况下5次准确率、损失值，并计算均值；
- 做出曲线；

```
cd Ecust/louishsu/recognize_stage_2
python
>>> from main_update_config import main_3_1
>>> main_3_1()       # 训练、测试
>>> main_3_1(True)   # 输出文件到`images`
```

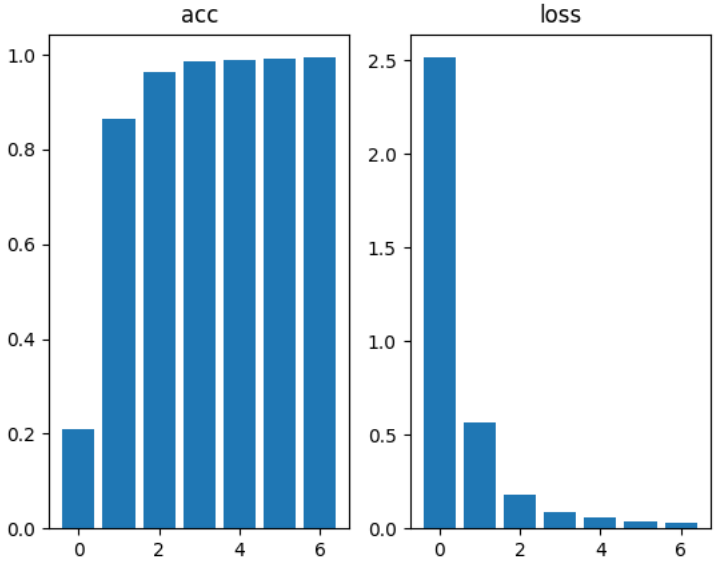
Multi

准确率：

count/比例	0.10: 0.70: 0.2	0.20: 0.60: 0.2	0.30: 0.50: 0.2	0.40: 0.40: 0.2	0.50: 0.30: 0.2	0.60: 0.20: 0.2	
1	0.2149619311094284	0.8771556615829468	0.9566406011581421	0.9844896197319031	0.990234375	0.9869298934936523	0.9
2	0.20664063096046448	0.8104456067085266	0.9422104954719543	0.989062488079071	0.9906250238418579	0.9917968511581421	
3	0.18599659204483032	0.9633825421333313	0.9828125238418579	0.979802131652832	0.9844209551811218	0.9945312738418579	0.99
4	0.21216189861297607	0.7828124761581421	0.958984375	0.9877291917800903	0.9937499761581421	0.9948021769523621	0.99
5	0.2265920341014862	0.8896991014480591	0.9828125238418579	0.9853854179382324	0.98828125	0.9952527284622192	0.99
average	0.2092706173658371	0.8646990776062011	0.9646921038627625	0.9852937698364258	0.9894623160362244	0.9926625847816467	0.99

损失值：

count/比例	0.10: 0.70: 0.2	0.20: 0.60: 0.2	0.30: 0.50: 0.2	0.40: 0.40: 0.2	0.50: 0.30: 0.2	0.60: 0.20: 0.2
1	2.4846150875091553	0.5406866669654846	0.24240295588970184	0.08398889005184174	0.058236200362443924	0.06166341155767441
2	2.491765022277832	0.7275170087814331	0.2726011872291565	0.08610193431377411	0.051581479609012604	0.04371415078639984
3	2.616888999938965	0.2849043011665344	0.09661058336496353	0.1156279444694519	0.06800567358732224	0.029323657974600792
4	2.54640531539917	0.7616688013076782	0.20859289169311523	0.08170180022716522	0.033651284873485565	0.034678198397159576
5	2.4347915649414062	0.5256006717681885	0.0914262980222702	0.07377012819051743	0.0759594514966011	0.018698975443840027
average	2.5148931980133056	0.5680754899978637	0.18232678323984147	0.08823813945055008	0.057486817985773084	0.03761567883193493



作图如下

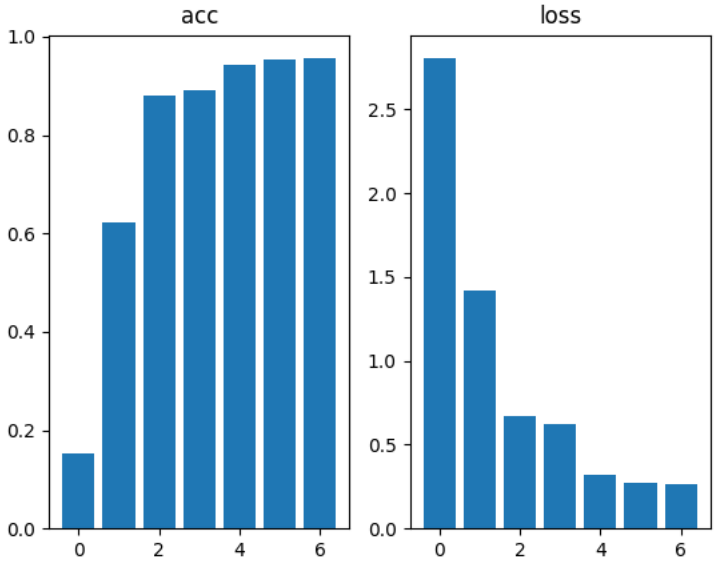
RGB

准确率：

count/比例	0.10: 0.70: 0.2	0.20: 0.60: 0.2	0.30: 0.50: 0.2	0.40: 0.40: 0.2	0.50: 0.30: 0.2	0.60: 0.20: 0.2	
1	0.08554687350988388	0.671122670173645	0.8922334909439087	0.911442756652832	0.94140625	0.95027095079422	0.954
2	0.15312500298023224	0.5469183921813965	0.890625	0.9198749661445618	0.936718761920929	0.953005313873291	0.9
3	0.2632812559604645	0.5569299459457397	0.8770450353622437	0.9144531488418579	0.954296886920929	0.9526745676994324	0.9
4	0.1308889091014862	0.6347512006759644	0.8611213564872742	0.7824583649635315	0.9387637972831726	0.9556798934936523	0.953
5	0.13710936903953552	0.6986255645751953	0.8792968988418579	0.9253906011581421	0.9442325830459595	0.95613032579422	0.962
average	0.15399028211832047	0.6216695547103882	0.8800643563270569	0.8907239675521851	0.943083655834198	0.9535522103309632	0.955

损失值：

count/比例	0.10: 0.70: 0.2	0.20: 0.60: 0.2	0.30: 0.50: 0.2	0.40: 0.40: 0.2	0.50: 0.30: 0.2	0.60: 0.20: 0.2	
1	3.252647876739502	1.3402305841445923	0.6356235146522522	0.6834784746170044	0.30298250913619995	0.2781504988670349	0
2	2.7481565475463867	1.6343910694122314	0.5718763470649719	0.45795875787734985	0.388595312833786	0.27012720704078674	
3	2.497880458831787	1.5152888298034668	0.6399282217025757	0.47438138723373413	0.25746339559555054	0.28221434354782104	0.
4	2.7885241508483887	1.2938731908798218	0.8670710325241089	1.0074412822723389	0.32476240396499634	0.22587835788726807	0.
5	2.7365176677703857	1.3123371601104736	0.6363851428031921	0.5015788674354553	0.330943763256073	0.28889214992523193	0
average	2.80474534034729	1.419224166870117	0.6701768517494202	0.6249677538871765	0.3209494769573212	0.2690525114536285	0.



作图如下

可知比例为0.50: 0.30: 0.2时，效果最佳。

3.2 波段对比实验

- 根据实验3.1得到的最优划分，在5次随机划分进行实验；
- 依次选择单个波段的数据进行实验；
- 统计各情况下5次准确率、损失值，并计算均值；
- 做出曲线；

```
cd Ecust/louishsu/recognize_stage_2
python
>>> from main_update_config import main_3_2
>>> main_3_2()       # 训练、测试
>>> main_3_2(True)   # 输出文件到`images`
```

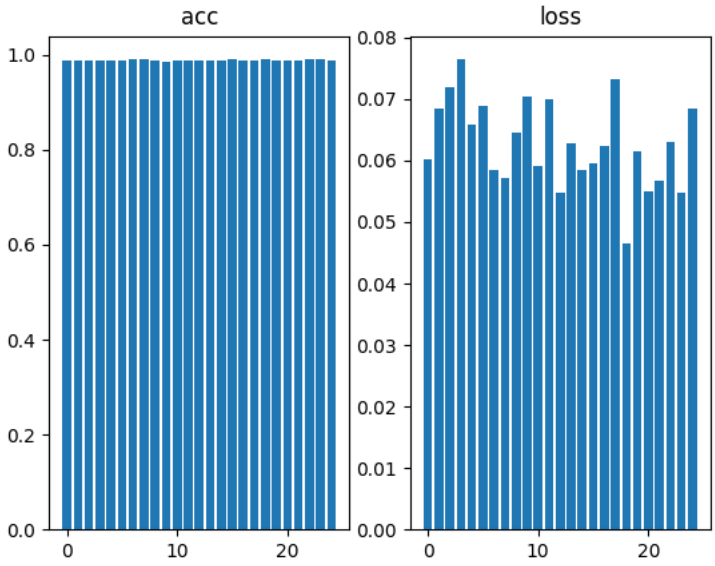
Multi

准确率：

count/波段索引	1	2	3	4	5	6	7	8	
1	0.9887	0.9863	0.9891	0.9898	0.9863	0.993	0.9899	0.9871	
2	0.9903	0.9898	0.993	0.991	0.9859	0.9891	0.991	0.9918	
3	0.9914000000000001	0.9883	0.9865	0.9790000000000001	0.9915	0.9864	0.9879000000000001	0.9922	
4	0.9906	0.9871	0.9883	0.9887	0.9863	0.9848	0.9918	0.9926	
5	0.9854999999999999	0.9836	0.9898	0.9887	0.9887	0.9840000000000001	0.9898	0.9852	
average	0.9893000000000001	0.98702	0.98934	0.98744	0.98774	0.9874600000000001	0.9900800000000001	0.98978	0.9888199

损失值：

count/波段索引	1	2	3	4	5	6	7	8	9	10
1	0.0516	0.0541	0.0638	0.0478	0.0762	0.0264	0.0643	0.0619	0.0703	0.1034
2	0.0491	0.0606	0.0412	0.0649	0.06	0.056	0.0395	0.0391	0.0644	0.0483
3	0.0457	0.0671	0.1209	0.1393	0.0512	0.0729	0.0731	0.0612	0.078	0.0939
4	0.0518	0.0736	0.0646	0.0554	0.0784	0.0901	0.0464	0.0375	0.0513	0.0311
5	0.1029	0.0867	0.0688	0.0748	0.0636	0.0986	0.0693	0.0856	0.0589	0.0751
average	0.060219999999999996	0.06842000000000001	0.07186	0.07644	0.06588	0.0688	0.058519999999999996	0.05706	0.06458	0.07036



作图如下

RGB

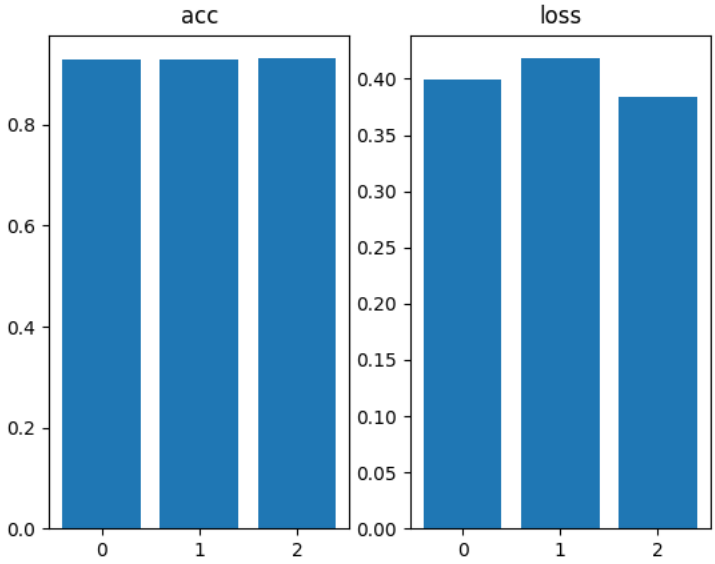
准确率：

count/波段索引	R	G	B
1	0.9227	0.9418000000000001	0.9262
2	0.9351999999999999	0.9223	0.9362999999999999
3	0.9254000000000001	0.9488	0.9370999999999999
4	0.9273	0.9161	0.9351999999999999
5	0.9398000000000001	0.9161	0.9223
average	0.93008	0.9290200000000001	0.9314199999999999

损失值：

count/波段索引	R	G	B
1	0.4225	0.3349	0.3758

count/波段索引	R	G	B
2	0.428	0.5199	0.3878
3	0.4294	0.3031	0.3737
4	0.4032	0.4461	0.3823
5	0.3114	0.4865	0.4001
average	0.3989	0.4181	0.38394000000000006



作图如下

根据图3.2.1.1，按准确率将波段排序，降序排序如下：

```
Generating tables and figures [Multi]...
Best:  [23 19 24 16  7  8 21 13 17  3  1 14 22 11  9 20 15 12  5  6  4 25 18  2
 10]
Generating tables and figures [RGB]...
Best:  [3 1 2]
```

3.3 波段组合实验

> 该部分实验仅针对多光谱数据。

- 根据实验3.1得到的最优划分，在5次随机划分进行实验；
- 根据实验3.2得到的最优排序，依次选择最前1, 2, ..., 25个波段进行组合实验；
- 统计各情况下5次准确率、损失值，并计算均值；
- 做出曲线；

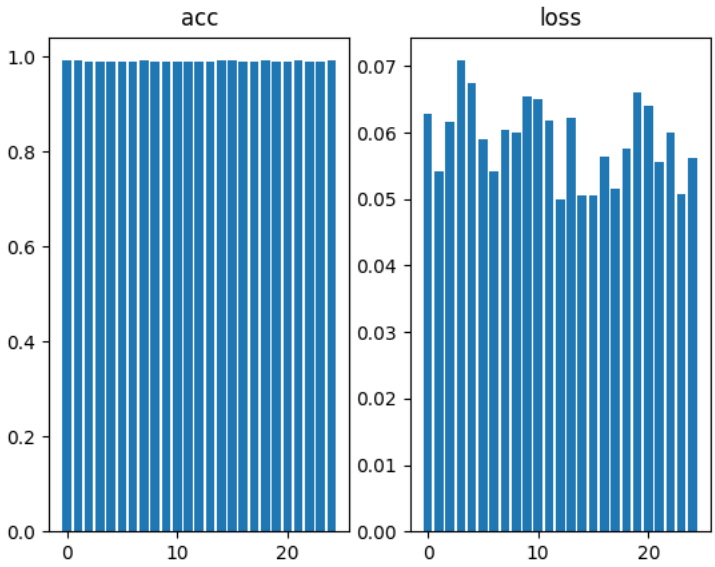
```
cd Ecust/louishsu/recognize_stage_2
python
>>> from main_update_config import main_3_3
>>> main_3_3()       # 训练、测试
>>> main_3_3(True)   # 输出文件到`images`
```

准确率：

count/组合数	1	2	3	4	5	6	
1	0.9859	0.989453136920929	0.9886718988418579	0.98828125	0.9878906011581421	0.989453136920929	0.98
2	0.9934000000000001	0.9887178540229797	0.9922334551811218	0.98828125	0.9906250238418579	0.991015613079071	0.98
3	0.993	0.9925781488418579	0.991015613079071	0.9829044342041016	0.9879825711250305	0.9879366159439087	0.990
4	0.9934000000000001	0.9925781488418579	0.9906250238418579	0.9937499761581421	0.98828125	0.987109363079071	0.98
5	0.9871	0.989453136920929	0.9847656488418579	0.989062488079071	0.9898437261581421	0.9847656488418579	0.989
average	0.99056	0.9905560851097107	0.9894623279571533	0.988455879688263	0.9889246344566345	0.9880560755729675	0.989

损失值：

count/ 组合数	1	2	3	4	5	
1	0.0849	0.04418618232011795	0.05667092278599739	0.05520736053586006	0.06052742153406143	0.048861023038625
2	0.047	0.06396504491567612	0.035303931683301926	0.07225267589092255	0.058264702558517456	0.0387883596122264
3	0.0629	0.04650916904211044	0.06114254519343376	0.11013656854629517	0.0874512791633606	0.056076031178236
4	0.0468	0.03698722645640373	0.06845482438802719	0.04799146205186844	0.055125992745161057	0.068261831998825
5	0.0731	0.07956121861934662	0.08703341335058212	0.06868435442447662	0.07599598914384842	0.083353713154792
average	0.06294000000000001	0.054241768270730975	0.06172112748026848	0.07085448428988457	0.06747307702898979	0.0590681917965412



作图如下

3.4 光谱分辨率实验

> 该部分实验仅针对多光谱数据。

- 根据实验3.1得到的最优划分，在5次随机划分进行实验；
- 依次选择步长为1, 2, ..., 25，进行组合波段实验
- 统计各情况下5次准确率、损失值，并计算均值；
- 做出曲线；

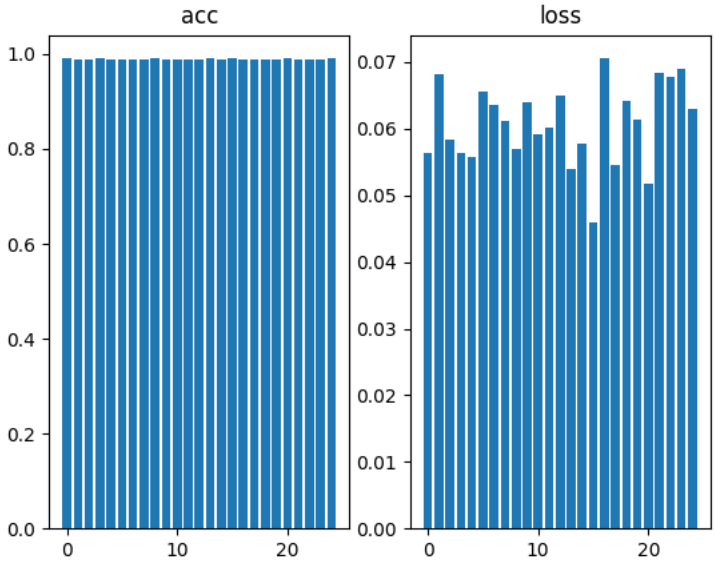
```
cd Ecust/louishsu/recognize_stage_2
python
>>> from main_update_config import main_3_4
>>> main_3_4()       # 训练、测试
>>> main_3_4(True)   # 输出文件到`images`
```

准确率：

count/ 波段步长	1	2	3	4	5	6	
1	0.9914000000000001	0.986328125	0.9832950830459595	0.989453136920929	0.989062488079071	0.987500011920929	0.9898
2	0.991	0.991406261920929	0.989453136920929	0.9917968511581421	0.990234375	0.990234375	
3	0.9902	0.9898897409439087	0.9891084432601929	0.9863740801811218	0.9922334551811218	0.9832490682601929	0.9887
4	0.9918	0.989453136920929	0.9937499761581421	0.991406261920929	0.98828125	0.991015613079071	0.985
5	0.9879000000000001	0.983203113079071	0.9847656488418579	0.991015613079071	0.9867187738418579	0.9898437261581421	0.9867
average	0.99046	0.9880560755729675	0.9880744576454162	0.9900091886520386	0.9893060684204101	0.988368558883667	0.9885

损失值：

count/波段步长	1	2	3	4	5	
1	0.047	0.07500302791595459	0.0641971156001091	0.05127560347318649	0.050630368292331696	0.07243739068508
2	0.0513	0.0368070974946022	0.04360317438840866	0.0516175739467144	0.048755329102277756	0.06324036419391
3	0.0685	0.06646515429019928	0.07506982237100601	0.08891331404447556	0.02729402855038643	0.09428296238183
4	0.0339	0.05444393306970596	0.031110206618905067	0.04675958305597305	0.0582125298678875	0.035836659371852
5	0.0808	0.10800175368785858	0.07760612666606903	0.043338291347026825	0.09390462934970856	0.06238267943263
average	0.056299999999999996	0.06814419329166413	0.05831728912889957	0.05638087317347527	0.05575937703251839	0.0656360112130



作图如下

3.5 鲁棒性实验

- 根据实验3.1得到的最优划分，在5次随机划分进行实验；
- 选用全部波段进行实验；
- 统计5次实验中，改变条件得到表格；
- 做出曲线

```
cd Ecust/louishsu/recognize_stage_2
python
>>> from main_update_config import main_3_5
>>> main_3_5()       # 训练、测试
>>> main_3_5(True)   # 输出文件到`images`
```

3.5.1 干扰种类

统计无干扰、干扰1、干扰2、干扰3下，每次实验的准确率、损失

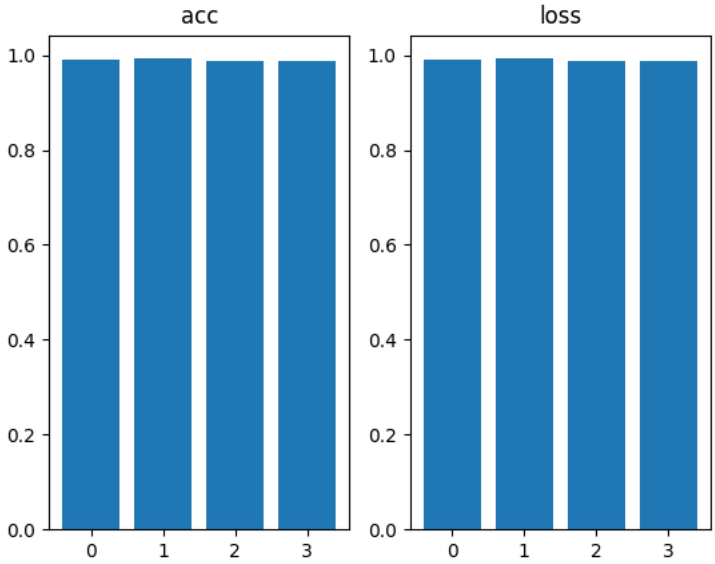
Multi

准确率

count/光照	illum1	illum2	illum3	normal
1	0.9886178970336914	0.9937106966972351	0.9952531456947327	0.9821717739105225
2	0.9936000108718872	0.9918166995048523	0.9906976819038391	0.9854604005813599
3	0.9854369163513184	0.9888888597488403	0.9789643883705139	0.9842271208763123
4	0.9917762875556946	0.9951768517494202	0.9954407215118408	0.991830050945282
5	0.9924585223197937	0.9935275316238403	0.9771241545677185	0.9884678721427917
average	0.9903779268264771	0.9926241278648377	0.987496018409729	0.9864314436912537

损失值

count/光照	illum1	illum2	illum3	normal
1	0.0939134955406189	0.02421519160270691	0.029643215239048004	0.09196339547634125
2	0.05477509647607803	0.04340473189949989	0.057754695415496826	0.054503247141838074
3	0.05261078476905823	0.027733400464057922	0.11067312955856323	0.08502095192670822
4	0.04693099856376648	0.02715321071445942	0.026044398546218872	0.03657500445842743
5	0.04717982932925224	0.10875410586595535	0.09701123088598251	0.05875115841627121
average	0.9903779268264771	0.9926241278648377	0.987496018409729	0.9864314436912537



作图如下

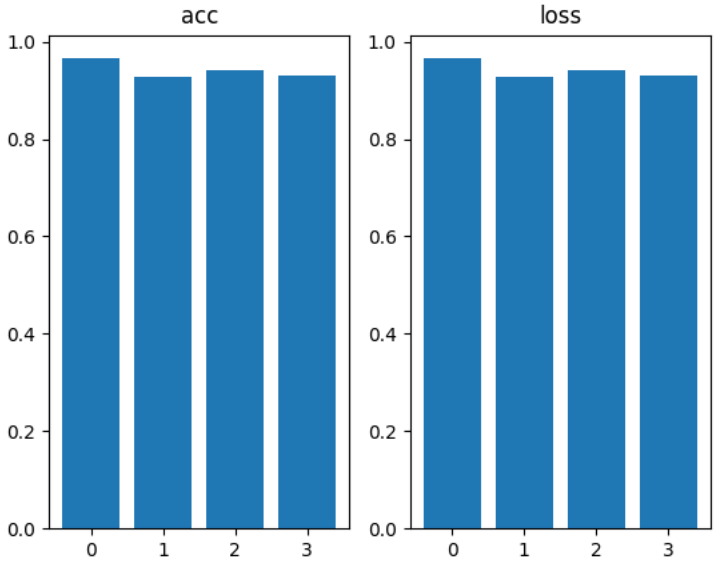
RGB

准确率

count/光照	illum1	illum2	illum3	normal
1	0.9593495726585388	0.9371069073677063	0.9430379867553711	0.9205834865570068
2	0.9567999839782715	0.9279869198799133	0.9410852789878845	0.9143780469894409
3	0.9724919199943542	0.9365079402923584	0.9514563083648682	0.9526813626289368
4	0.9654605388641357	0.9196141362190247	0.9468085169792175	0.9199346303939819
5	0.9728506803512573	0.9190938472747803	0.9297385811805725	0.9505766034126282
average	0.9653905391693115	0.9280619502067566	0.9424253344535828	0.9316308259963989

损失值

count/光照	illum1	illum2	illum3	normal
1	0.21658116579055786	0.3721185028553009	0.32356229424476624	0.323869913816452
2	0.2959308922290802	0.4024837911128998	0.37342268228530884	0.5195052027702332
3	0.14584186673164368	0.36678633093833923	0.331096887588501	0.20850110054016113
4	0.17342951893806458	0.46703585982322693	0.259420782327652	0.42468032240867615
5	0.15539292991161346	0.5143899917602539	0.35202690958976746	0.3402990996837616
average	0.9653905391693115	0.9280619502067565	0.9424253344535828	0.9316308259963989



作图如下

3.5.2 偏转角度

统计各角度下，每次实验的准确率、损失

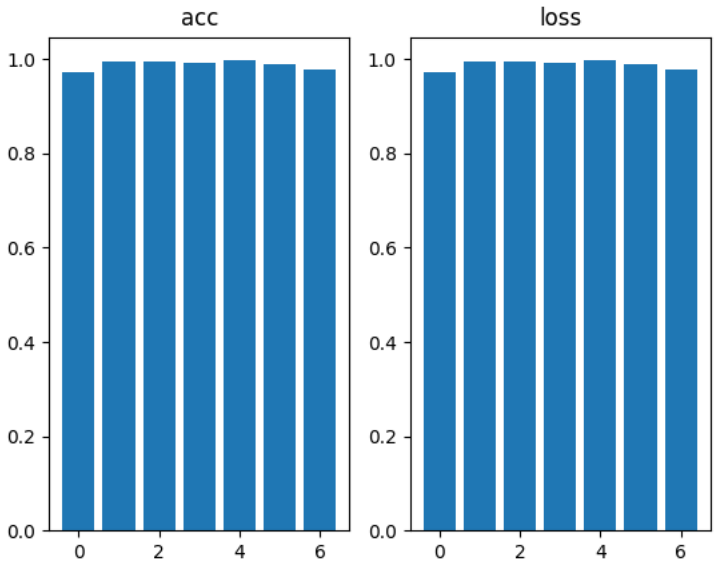
Multi

准确率

count/位置	1	2	3	4	5	6	
1	0.9645161032676697	0.9970930218696594	1.0	0.9930915236473083	0.9968652129173279	0.9871382713317871	0.986
2	0.9843260049819946	1.0	0.9911242723464966	0.9863247871398926	1.0	0.9933993220329285	0.981
3	0.9592476487159729	0.9904761910438538	0.9967948794364929	0.9901153445243835	0.9935897588729858	0.9878787994384766	0.967
4	0.988304078578949	0.9937499761581421	0.9967213273048401	0.9950413107872009	1.0	0.9967532753944397	0.983
5	0.9732441306114197	0.9963369965553284	0.991253674030304	0.9968101978302002	0.9968152642250061	0.9839228391647339	0.969
average	0.9739275932312011	0.9955312371253967	0.9951788306236267	0.9922766327857971	0.997454047203064	0.9898185014724732	0.977

损失值

count/位置	1	2	3	4	5	
1	0.21385392546653748	0.018454650416970253	0.003290648339316249	0.05989725515246391	0.017544543370604515	0.0552603118121
2	0.11378344893455505	0.021852070465683937	0.03320414572954178	0.045077722519636154	0.011418147012591362	0.02559296227991
3	0.13433745503425598	0.03817714750766754	0.024781852960586548	0.07219754904508591	0.011839693412184715	0.07086151838302
4	0.060465868562459946	0.04879592731595039	0.011491558514535427	0.028201643377542496	0.008966307155787945	0.02663581445813
5	0.14273826777935028	0.013738660141825676	0.02814446948468685	0.030622409656643867	0.011270553804934025	0.10238239914178
average	0.9739275932312011	0.9955312371253967	0.9951788306236268	0.9922766327857971	0.997454047203064	0.9898185014724



作图如下

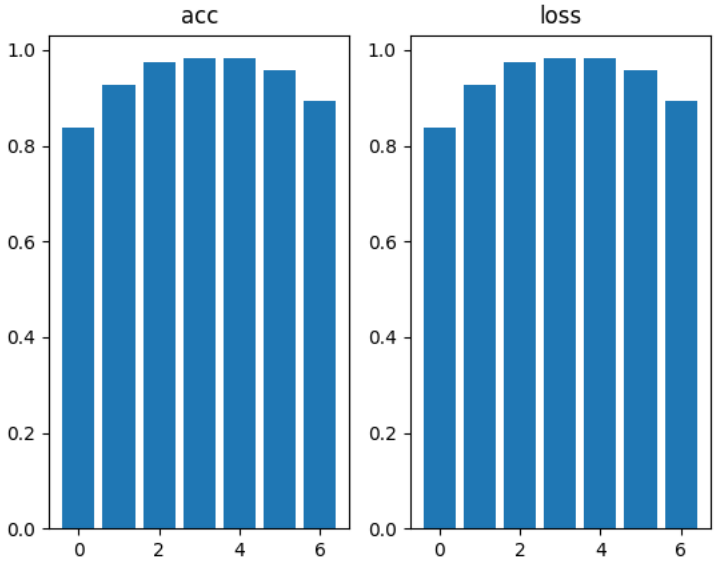
RGB

准确率

count/位置	1	2	3	4	5	6	
1	0.8258064389228821	0.9273256063461304	0.9821428656578064	0.9879102110862732	0.9811912178993225	0.9453375935554504	0.883
2	0.8338558077812195	0.9122257232666016	0.976331353187561	0.976068377494812	0.9873015880584717	0.9438943862915039	0.88
3	0.8714733719825745	0.9428571462631226	0.9743589758872986	0.9818781018257141	0.9839743375778198	0.9636363387107849	0.927
4	0.8274853825569153	0.9375	0.9770491719245911	0.9818181991577148	0.9645161032676697	0.9545454382896423	0.893
5	0.8361204266548157	0.9194139242172241	0.9620991349220276	0.9840510487556458	0.993630588054657	0.9871382713317871	0.876
average	0.8389482855796814	0.9278644800186158	0.9743963003158569	0.982345187664032	0.9821227669715882	0.9589104056358337	0.89

损失值

count/位置	1	2	3	4	5	6
1	0.7488226890563965	0.5277459621429443	0.06180528923869133	0.06347355246543884	0.07767003774642944	0.35331353545188904
2	1.0862796306610107	0.3764766156673431 4	0.12138664722442627	0.1369580179452896	0.1007782369852066	0.41596996784210205
3	0.7663352489471436	0.2771968245506286 6	0.18778261542320251	0.0747915655374527	0.06292636692523956	0.3183351457118988
4	0.9685717225074768	0.537351131439209	0.122942253947258	0.06130722165107727	0.12579067051410675	0.3192528784275055
5	0.9749406576156616	0.3080461621284485	0.16419431567192078	0.18036429584026337	0.03868933394551277	0.09315873682498932
average	0.8389482855796814	0.9278644800186157	0.974396300315857	0.982345187664032	0.9821227669715881	0.9589104056358337



作图如下

3.5.3 遮挡实验

统计无眼镜、近视眼镜、太阳镜下，每次实验的准确率、损失

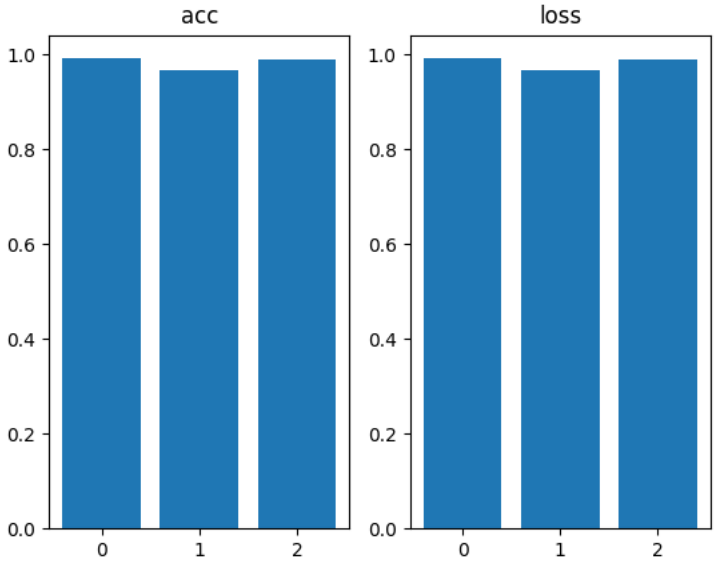
Multi

准确率

count/眼镜	1	5	6
1	0.9929999709129333	0.9641255736351013	0.9891696572303772
2	0.9925631880760193	0.9704433679580688	0.9892857074737549
3	0.9876298904418945	0.9494949579238892	0.9857650995254517
4	0.9955335259437561	0.9802955389022827	0.9893617033958435
5	0.989531397819519	0.9648241400718689	0.993220329284668
average	0.9916515946388245	0.9658367156982421	0.9893604993820191

损失值

count/眼镜	1	5	6
1	0.04149891063570976	0.15293356776237488	0.11383228749036789
2	0.04371387138962746	0.13737145066261292	0.056023892015218735
3	0.054187577217817307	0.11717072129249573	0.14082501828670502
4	0.027791477739810944	0.07308334857225418	0.050031088292598724
5	0.05457697808742523	0.3347029685974121	0.059104375541210175
average	0.9916515946388245	0.9658367156982423	0.989360499382019



作图如下

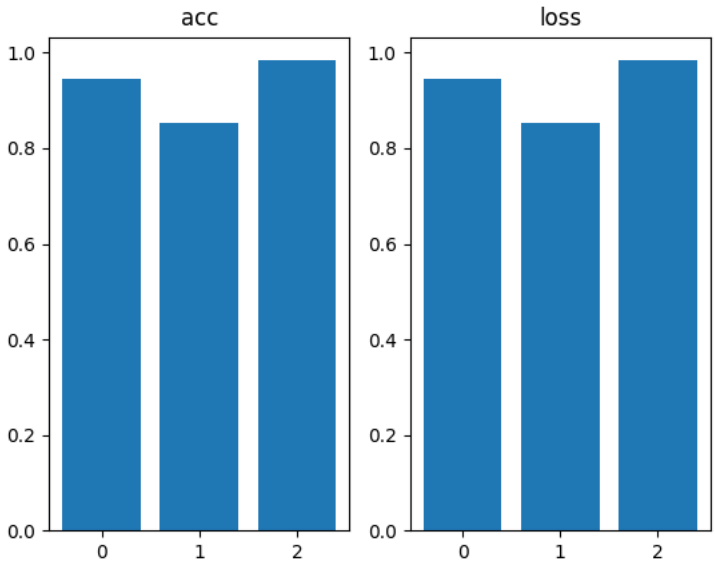
RGB

准确率

count/位置	1	2	3	4	5	6	
1	0.8258064389228821	0.9273256063461304	0.9821428656578064	0.9879102110862732	0.9811912178993225	0.9453375935554504	0.883
2	0.8338558077812195	0.9122257232666016	0.976331353187561	0.976068377494812	0.9873015880584717	0.9438943862915039	0.88
3	0.8714733719825745	0.9428571462631226	0.9743589758872986	0.9818781018257141	0.9839743375778198	0.9636363387107849	0.927
4	0.8274853825569153	0.9375	0.9770491719245911	0.9818181991577148	0.9645161032676697	0.9545454382896423	0.893
5	0.8361204266548157	0.9194139242172241	0.9620991349220276	0.9840510487556458	0.993630588054657	0.9871382713317871	0.876
average	0.8389482855796814	0.9278644800186158	0.9743963003158569	0.982345187664032	0.9821227669715882	0.9589104056358337	0.89

损失值

count/位置	1	2	3	4	5	6
1	0.7488226890563965	0.5277459621429443	0.06180528923869133	0.06347355246543884	0.07767003774642944	0.35331353545188904
2	1.0862796306610107	0.3764766156673431 4	0.12138664722442627	0.1369580179452896	0.1007782369852066	0.41596996784210205
3	0.7663352489471436	0.2771968245506286 6	0.18778261542320251	0.0747915655374527	0.06292636692523956	0.3183351457118988
4	0.9685717225074768	0.537351131439209	0.122942253947258	0.06130722165107727	0.12579067051410675	0.3192528784275055
5	0.9749406576156616	0.3080461621284485	0.16419431567192078	0.18036429584026337	0.03868933394551277	0.09315873682498932
average	0.8389482855796814	0.9278644800186157	0.974396300315857	0.982345187664032	0.9821227669715881	0.9589104056358337



作图如下