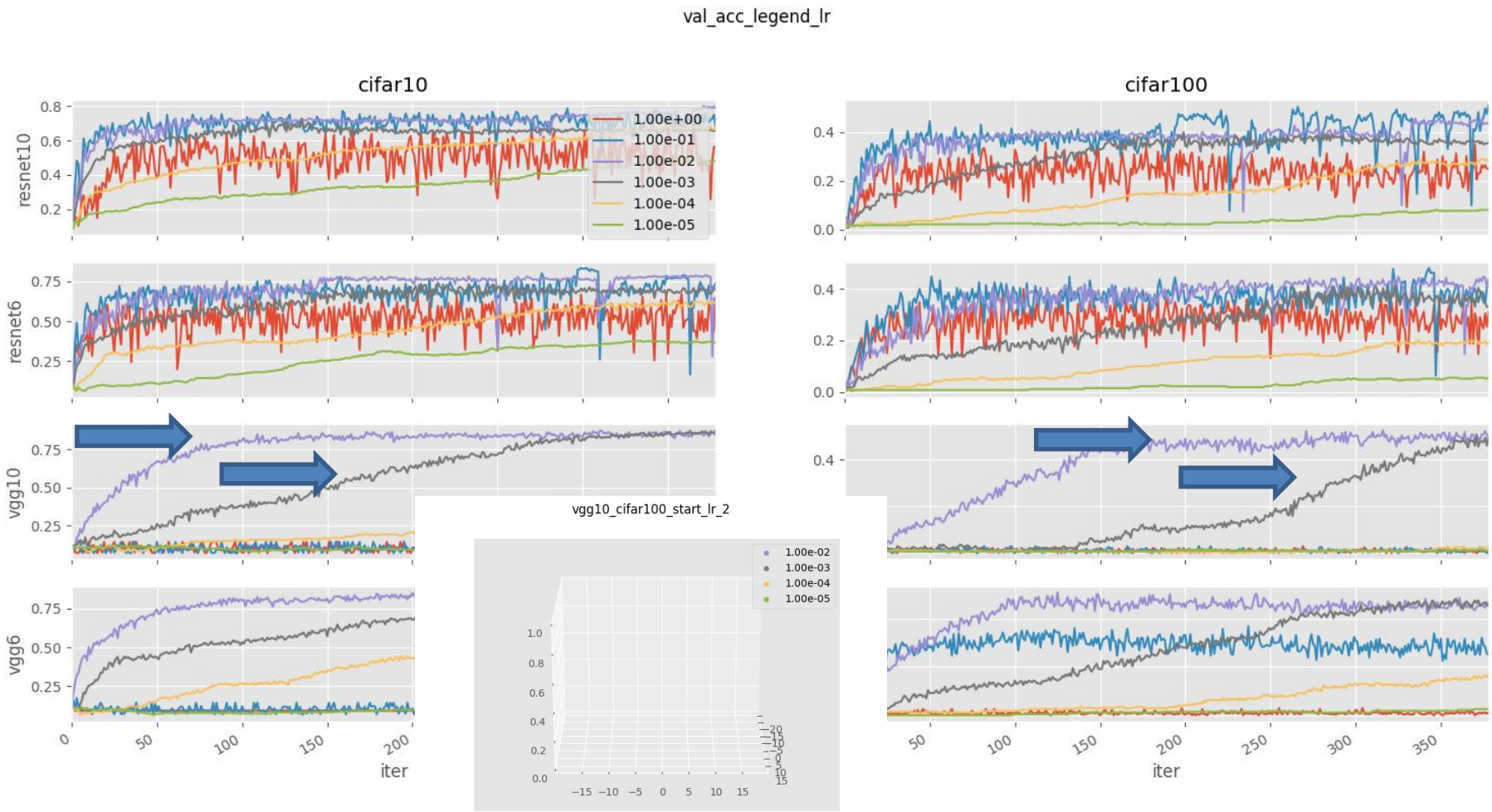
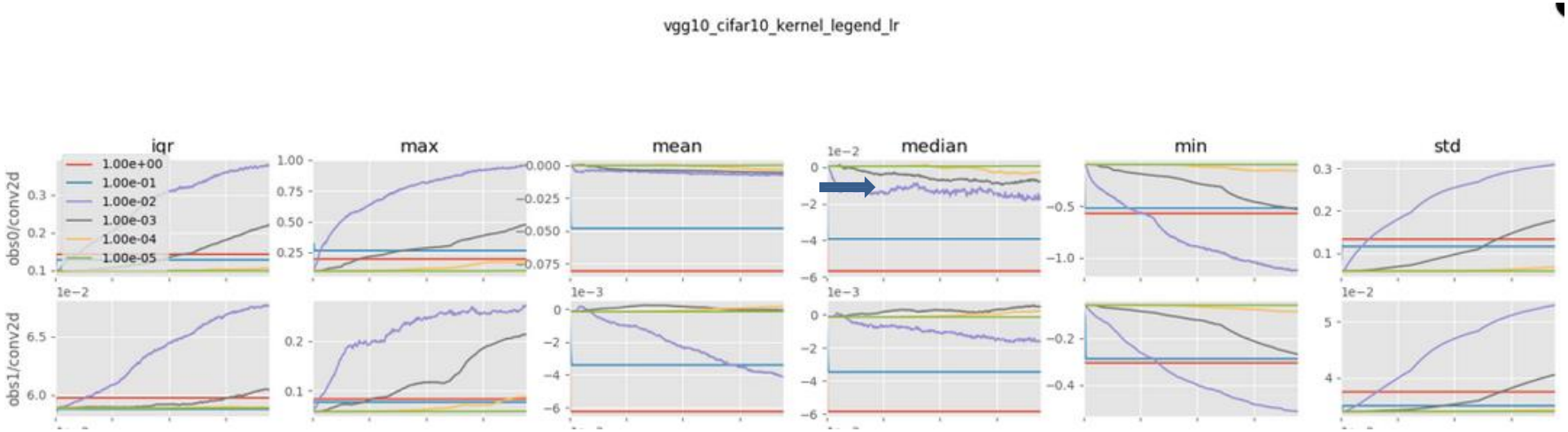
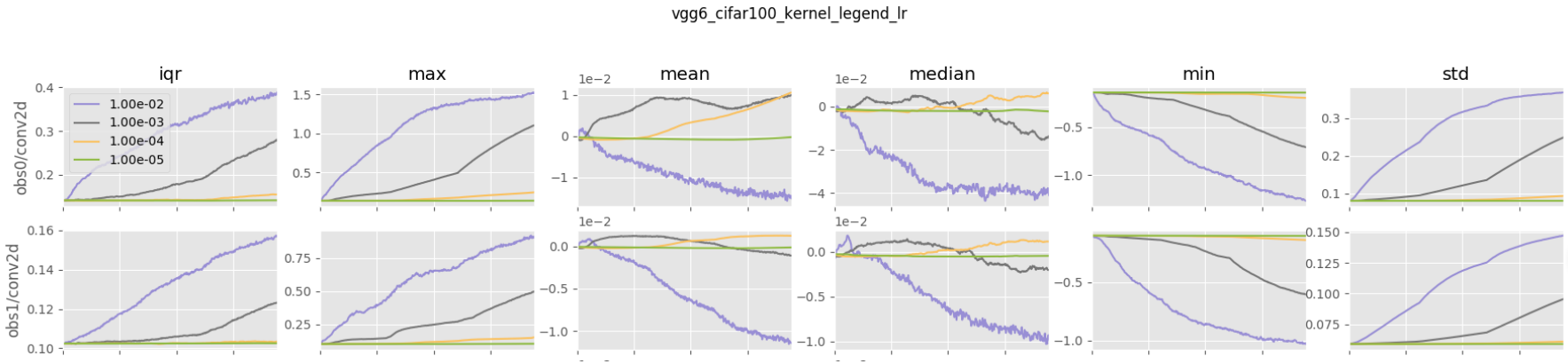
收敛速度不同 Final Acc相同



Val Acc 相同但Statistics不同且仍在变化

从bias 、kernel看

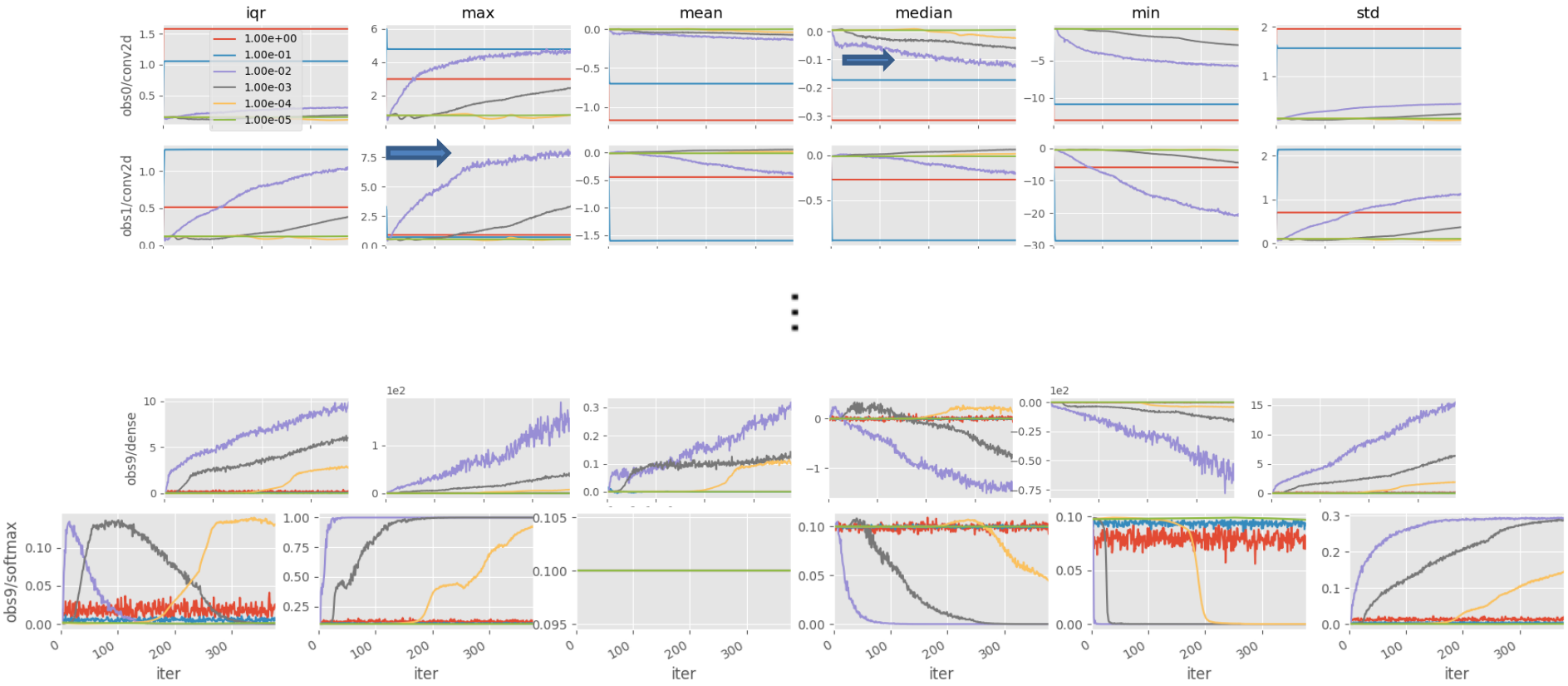




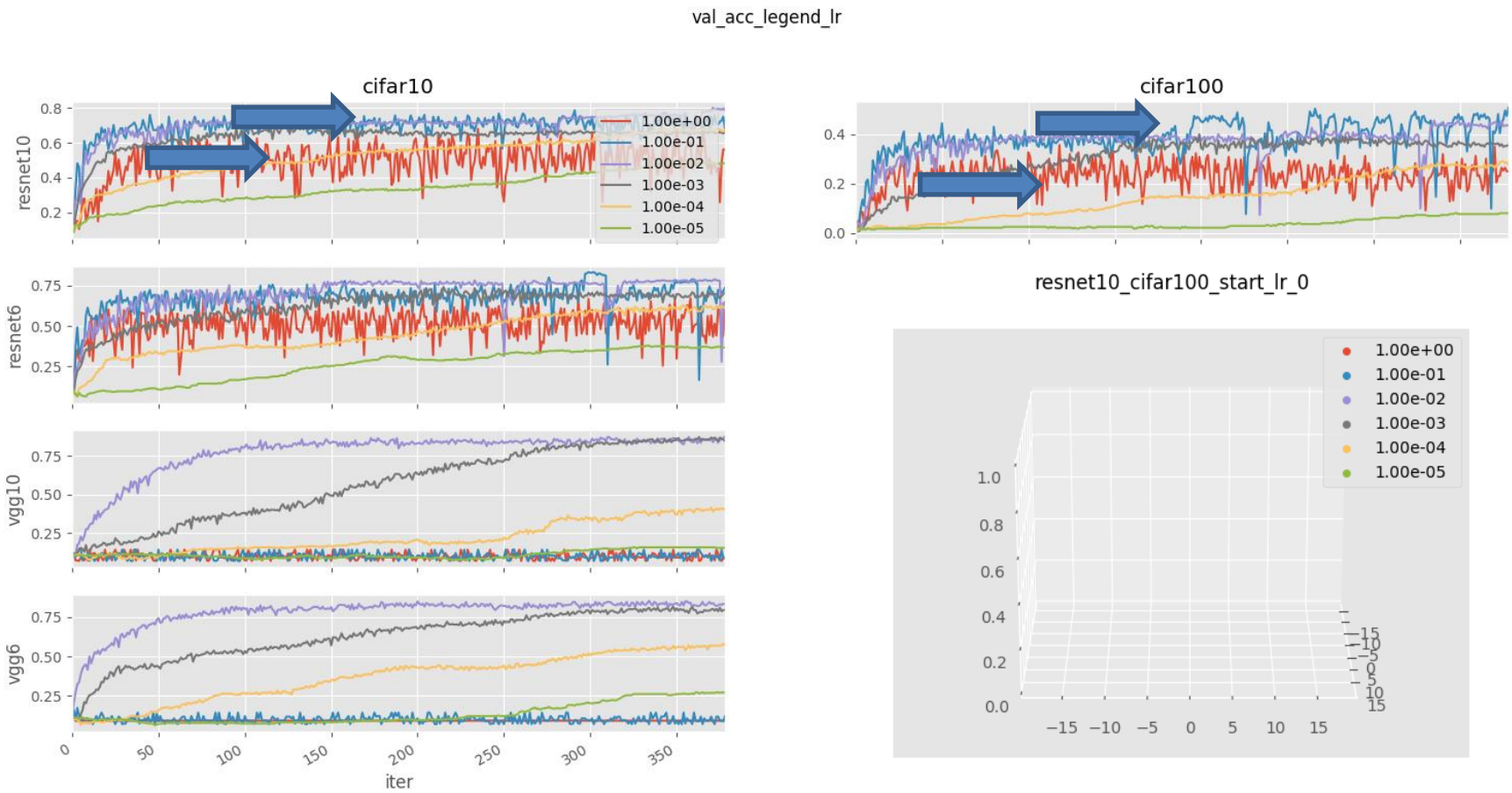
Val Acc 相同但Statistics不同且仍在变化

vgg10_cifar10_act_legend_lr

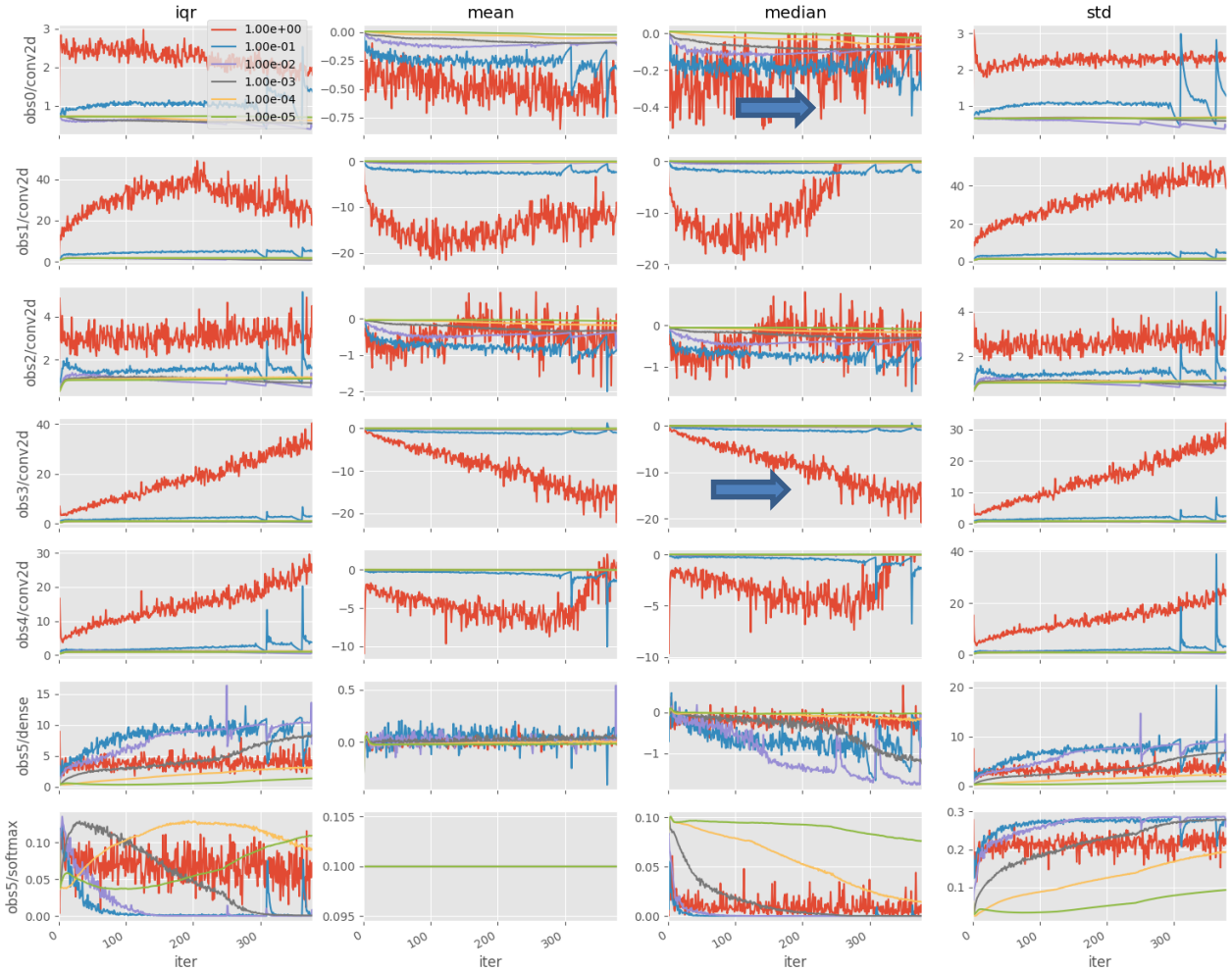
从act：　(除softmax的输出)



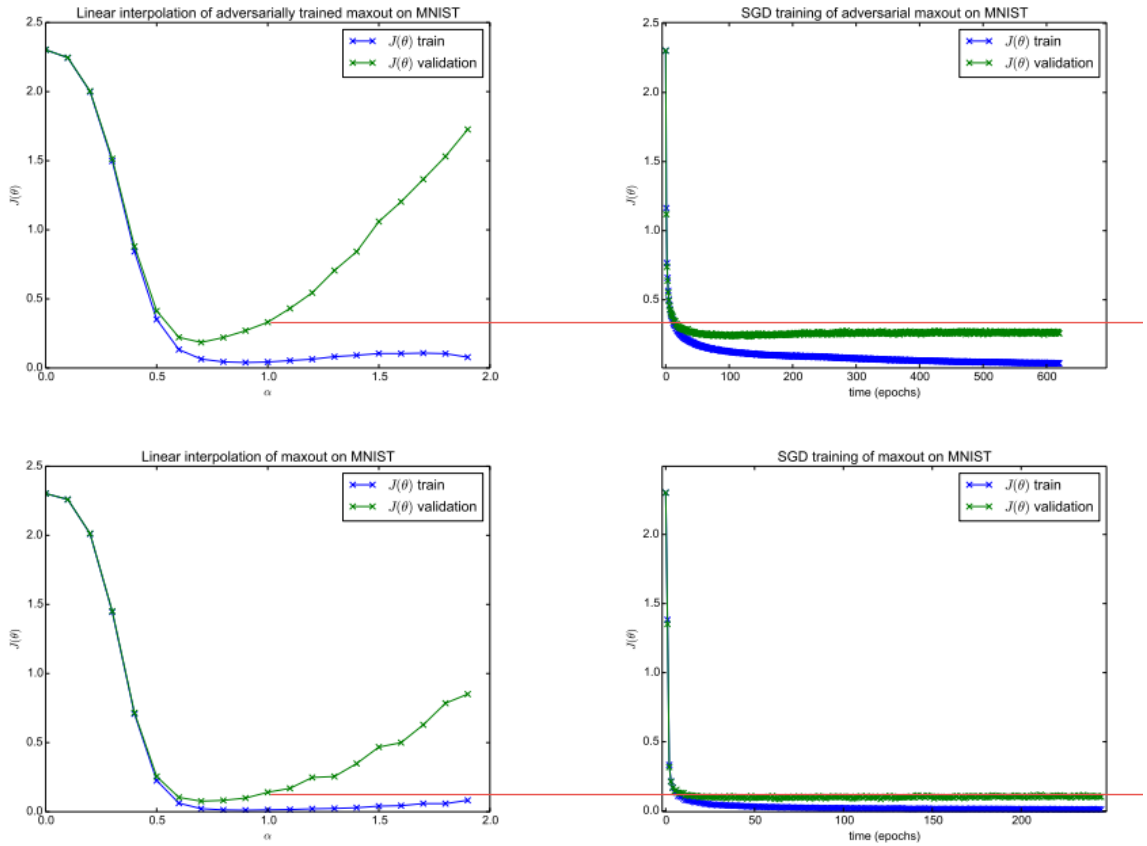
是否收斂到不同的Local Opt



resnet6_cifar10_act_legend_lr



- 用t-sne可视化，结论与qualitatively characterizing nn optimization problems 相同/不同
- 无论是否相同，都希望找到一种方法预测最终的性能

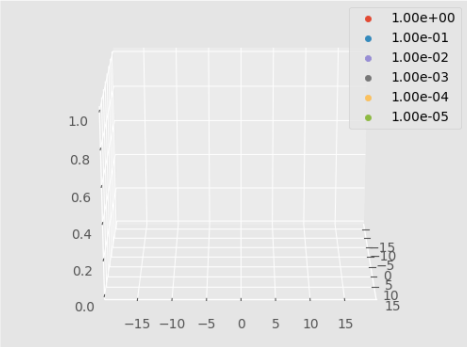


Statistics → (Current) Performance

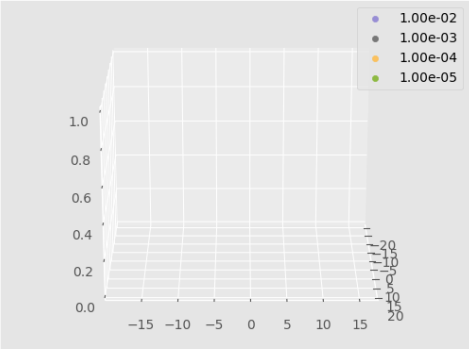
- 如何可视化网络状态
  - stat 降维到**两维**作为x,y，val_acc 作为z 观察training trajectory上的变化
- 观察：
  - 是否存在winding ravine, escape local minimal, saddle point 等现象
  - 非等间隔，观察速度mean of 2nd moment along the time,(需要采样率呈整数倍递减)
  - cifar10，vgg6单独降维v.s.所有模型放在一起降维
    - 值的范围是否与数据相关
    - 值的变化规律是否与数据无关
  - TODO: lr scheme 1 → decay 1e-2，是否到了不同的local minimal
    - 在cifar10上可能不同的local minimal val acc相近，search best practiced lr scheme

Embedding space

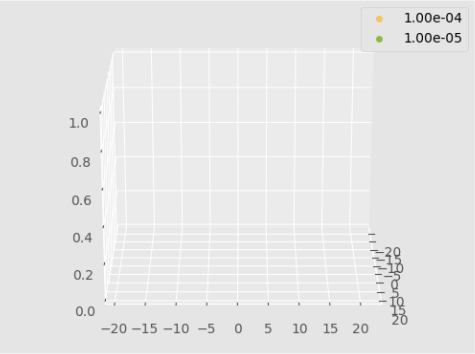
resnet10_cifar100_start_lr_0



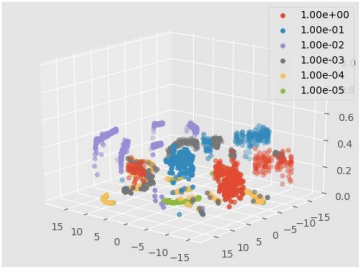
resnet10_cifar100_start_lr_2



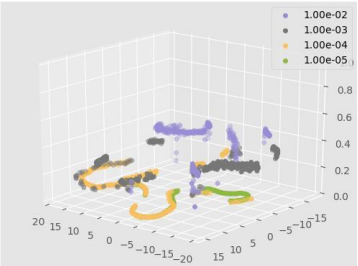
resnet10_cifar100_start_lr_4



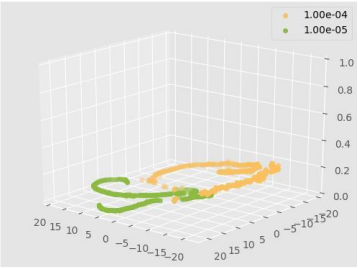
resnet10_cifar100_start_lr_0

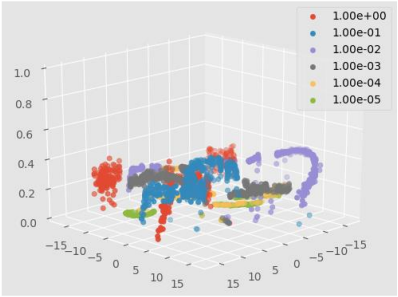


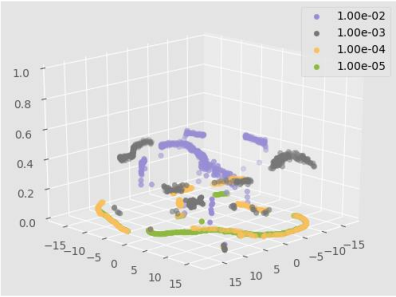
resnet10_cifar100_start_lr_2

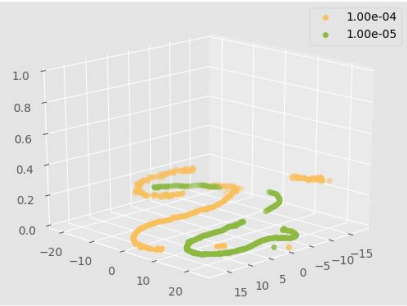


resnet10_cifar100_start_lr_4

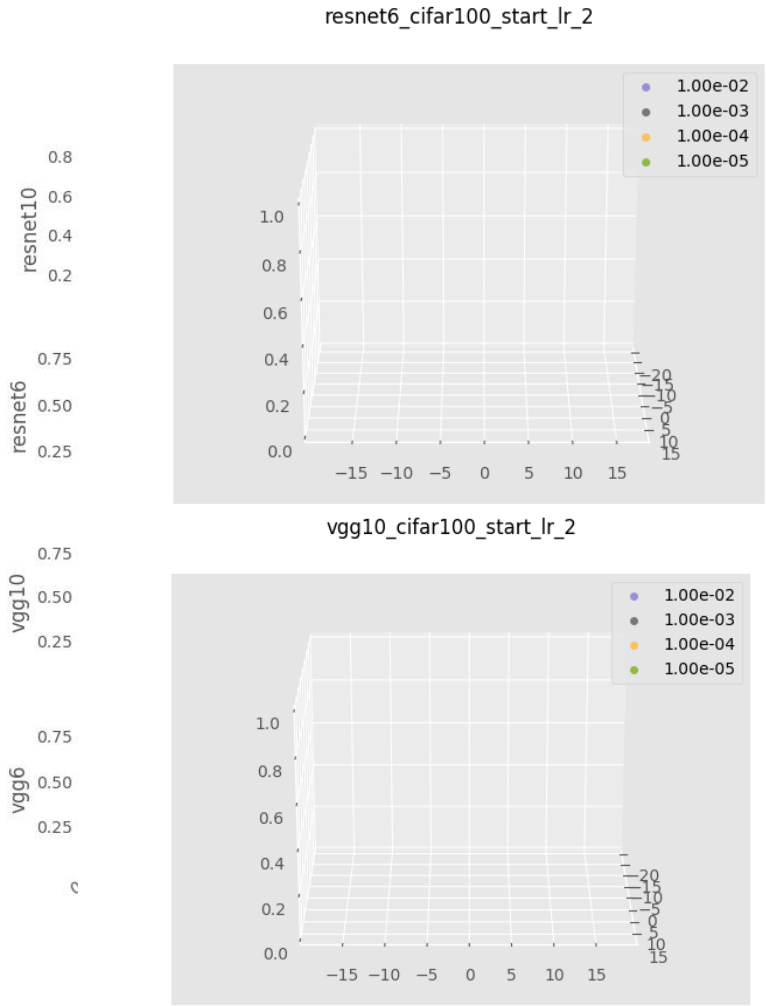


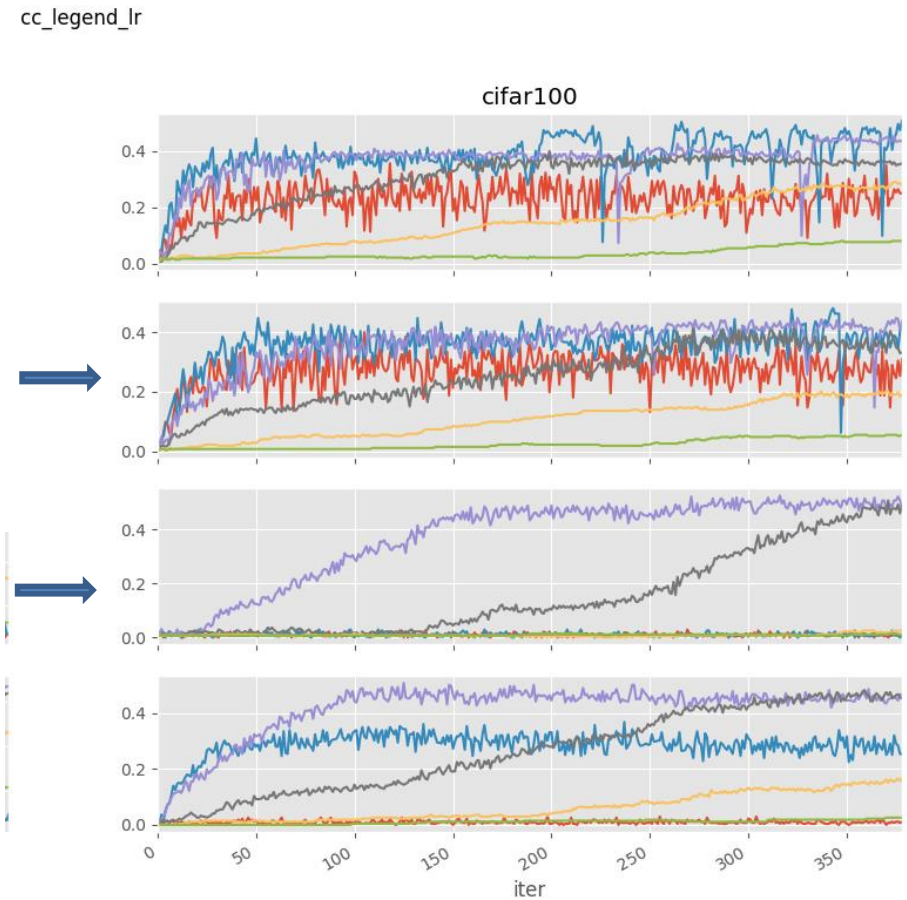






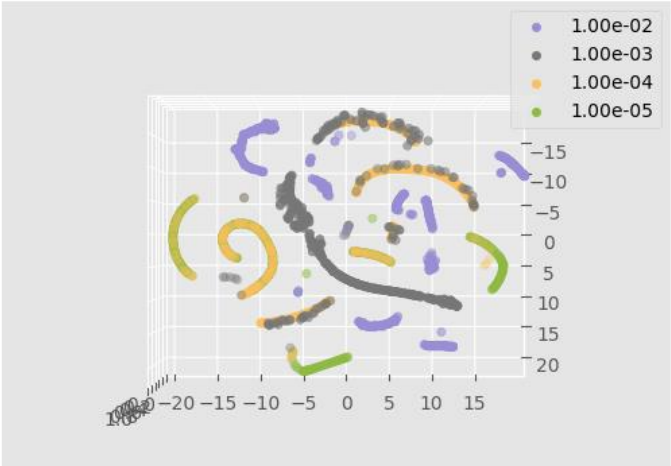
Evolve Pattern



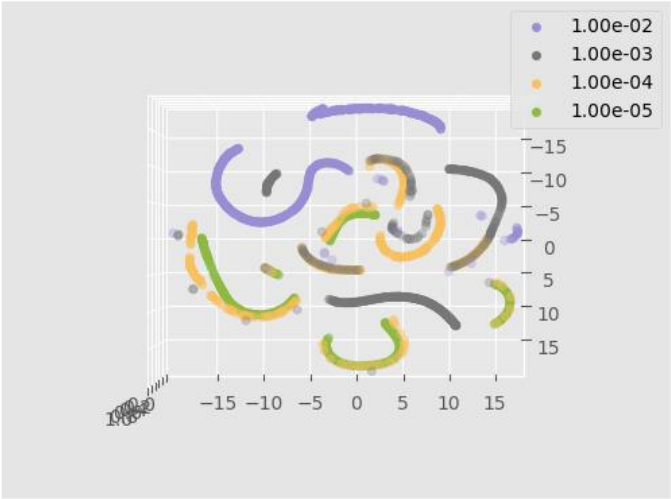


https://github.com/luzai/Perf_Pred

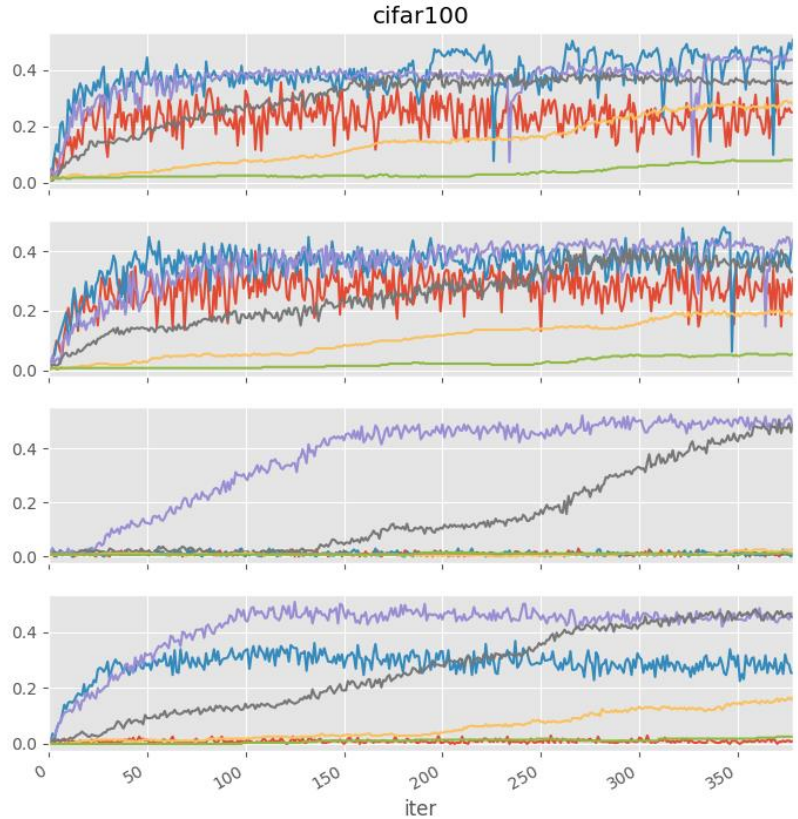
resnet6_cifar100_start_lr_2



vgg10_cifar100_start_lr_2

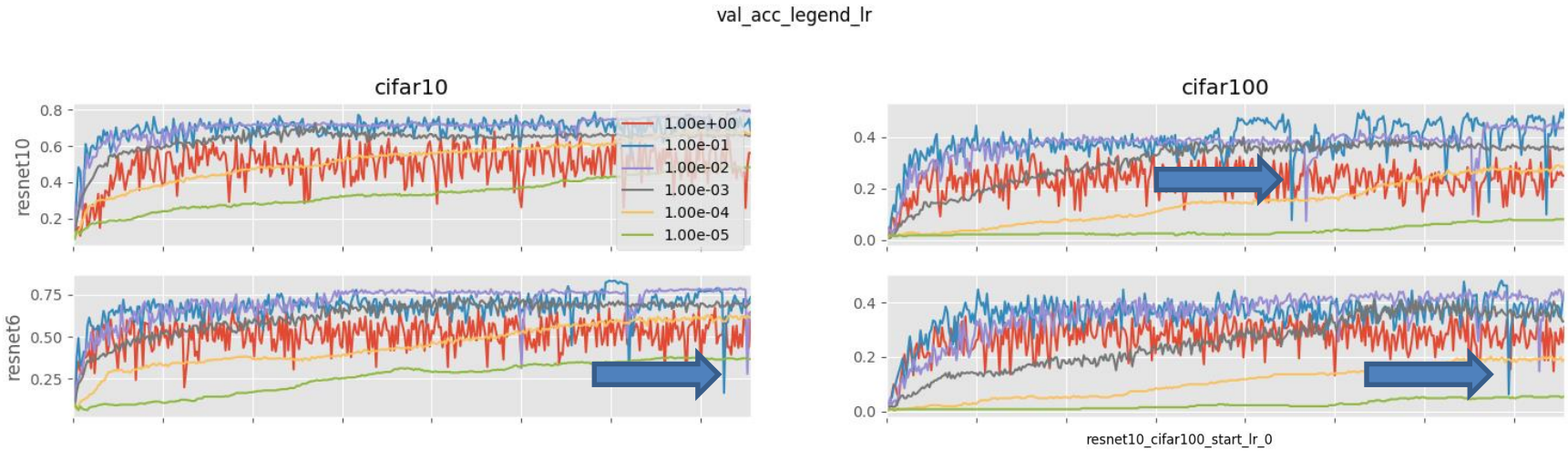


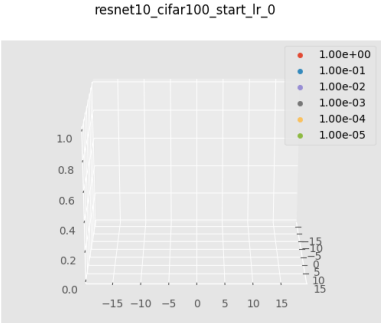
c_legend_lr

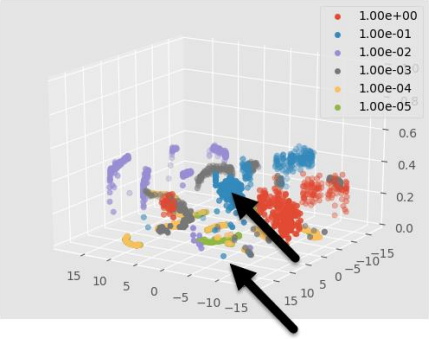


Resnet 不稳定

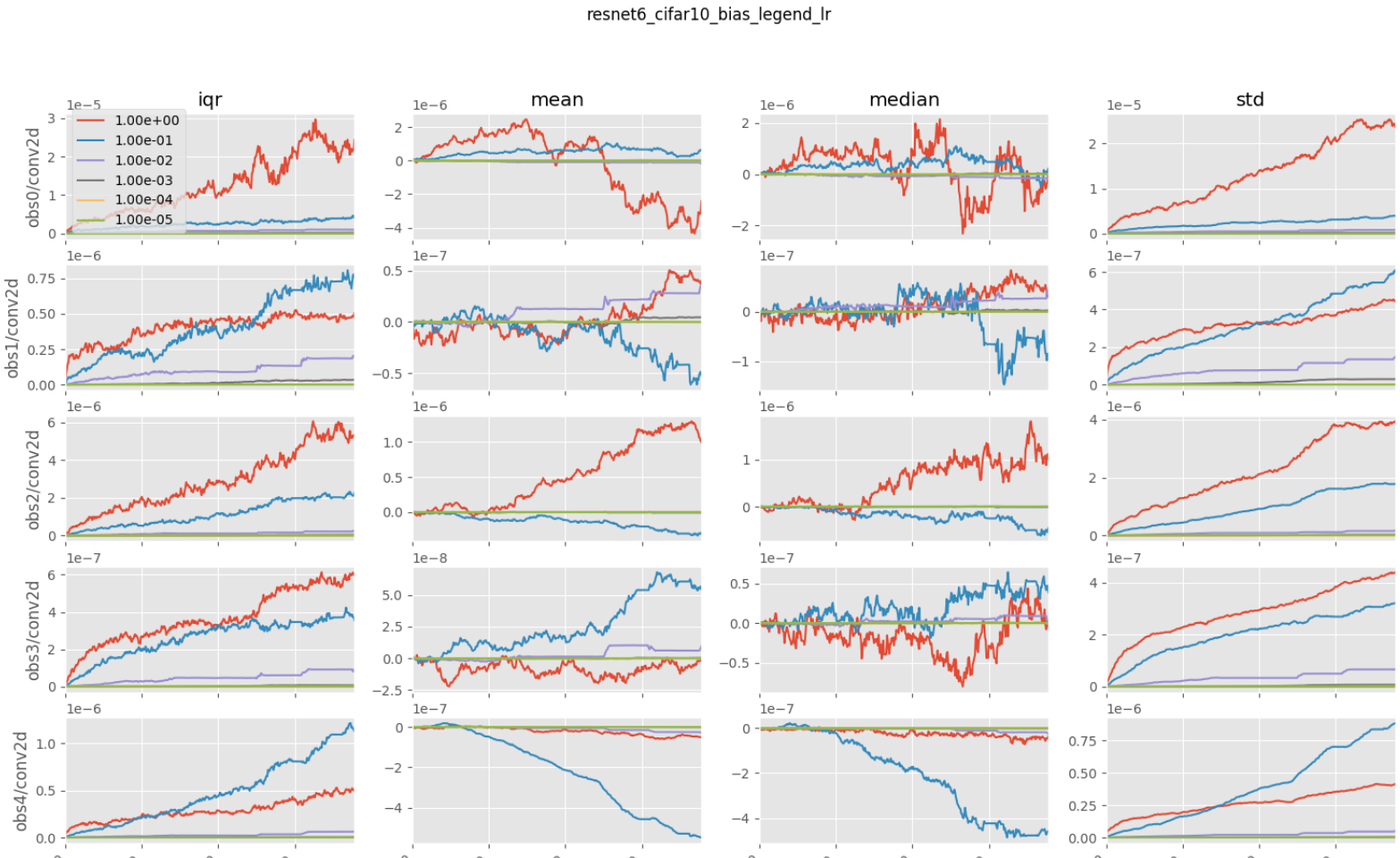
蓝线的学习率较大，经常出现梯度更新过大，
val acc急剧下降的情况，紫线较为稳定的，
但也会有类似情况



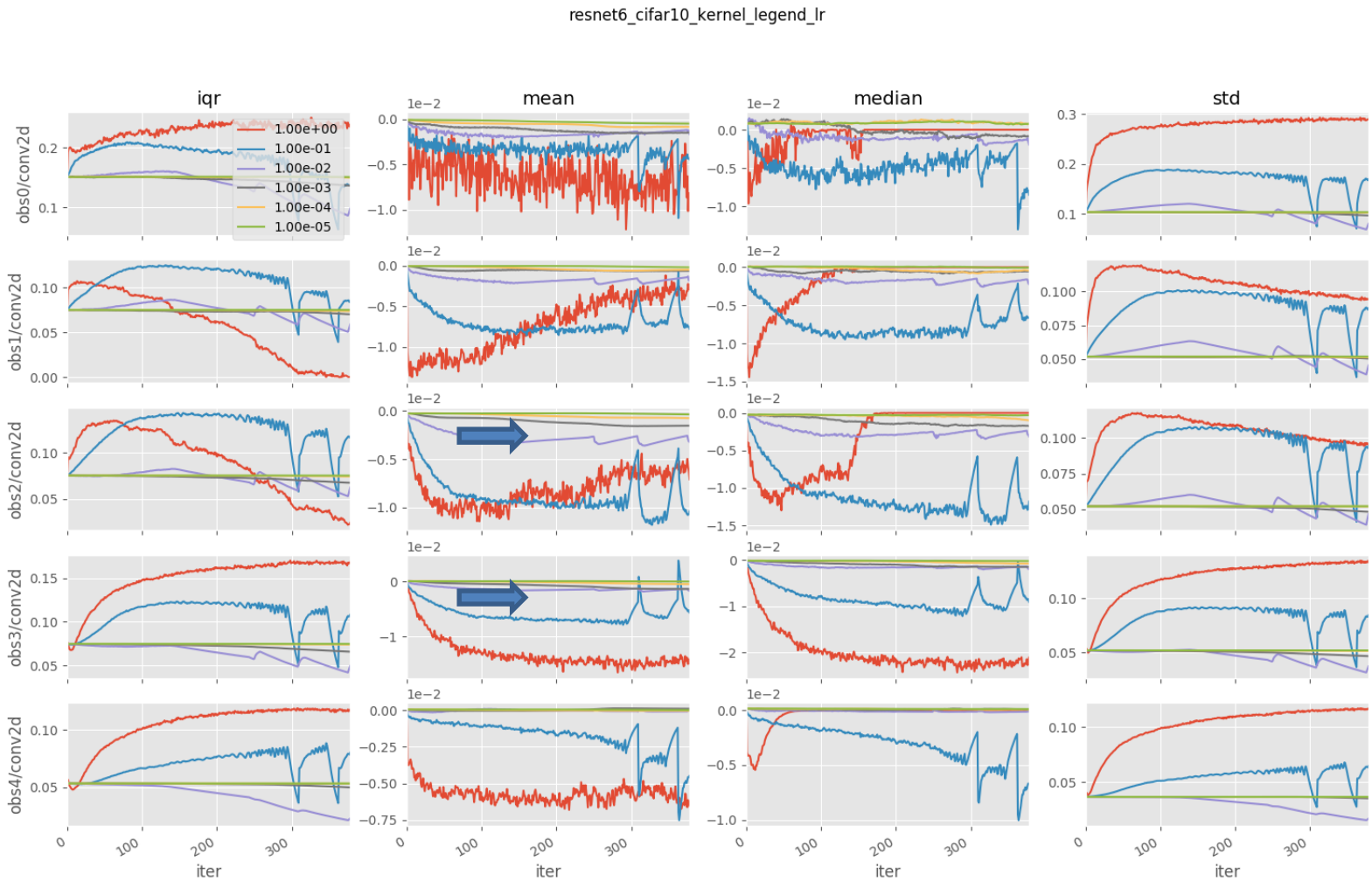




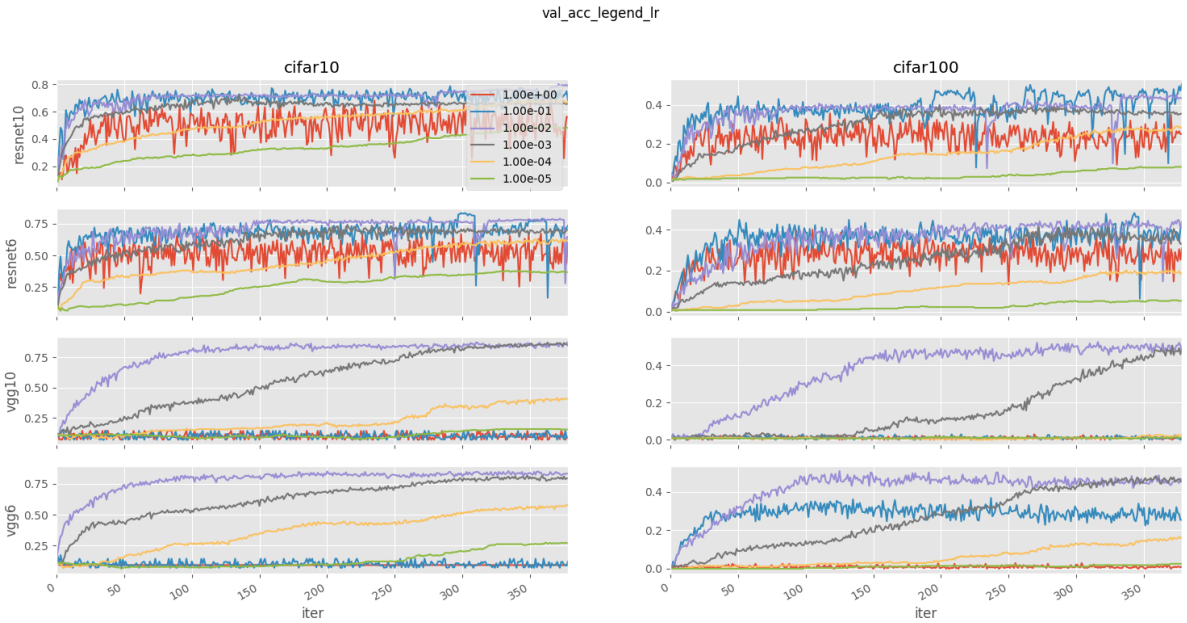
- 是由于梯度更新权重导致
- 某一个iter之后急剧下降
- Bias上没有明显变化

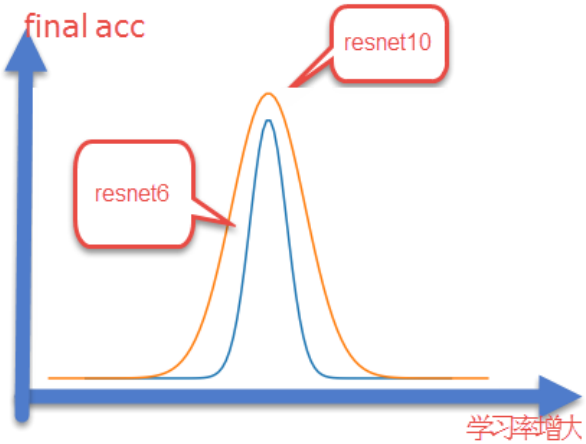


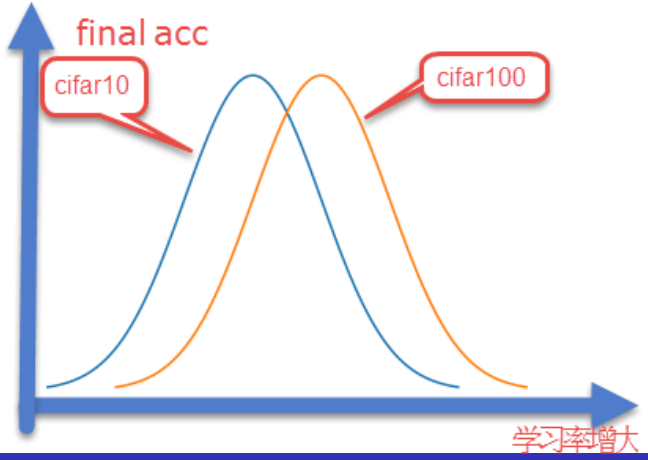
- 是由于梯度更新权重导致
- 每一层的pattern不一样，可能没有统一的结论。对于层数不同的模型的统计特性，如何输入到performance predict model



TODO: Performance Prediction

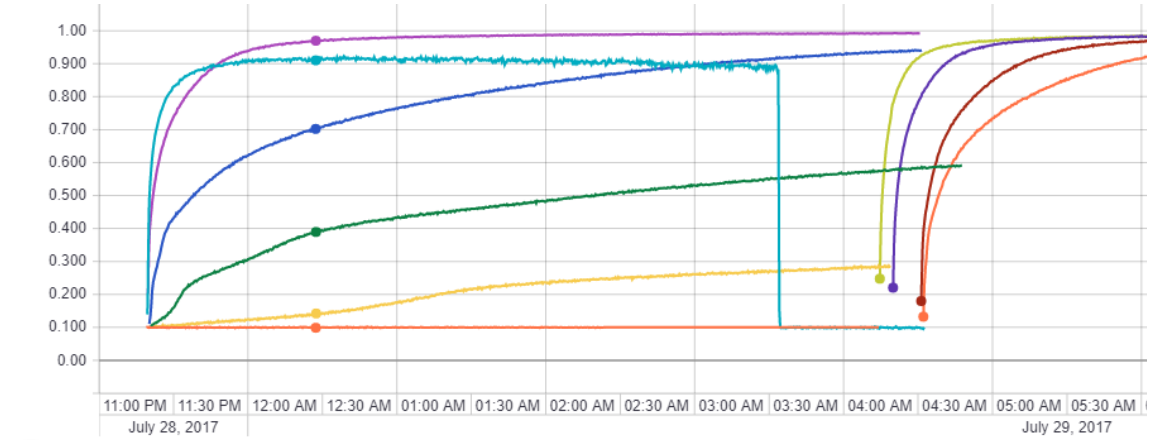






Problems: t-sne

Problems: lr=0.1,vgg6/10,cifar10



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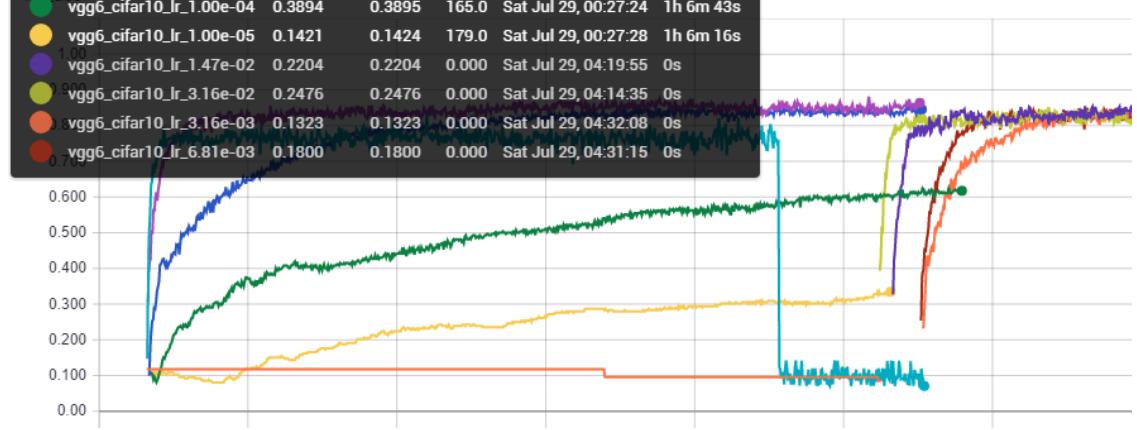
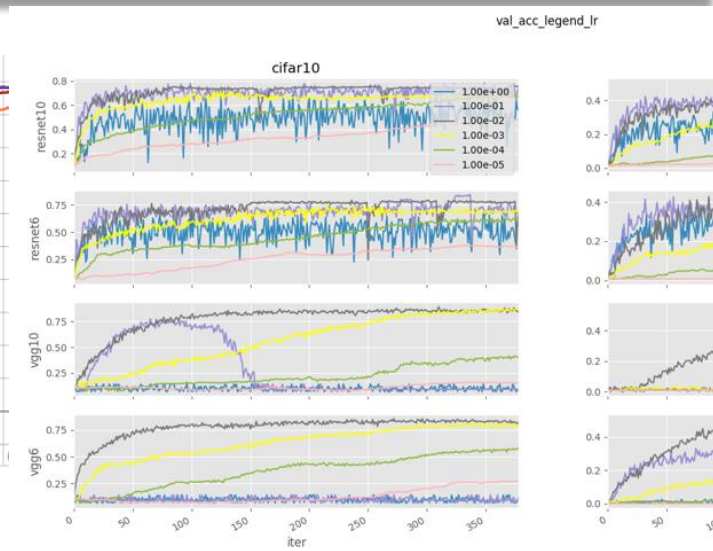
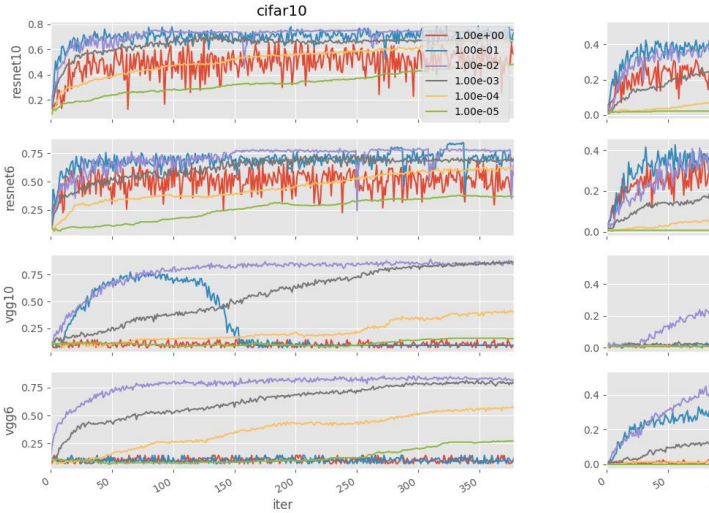
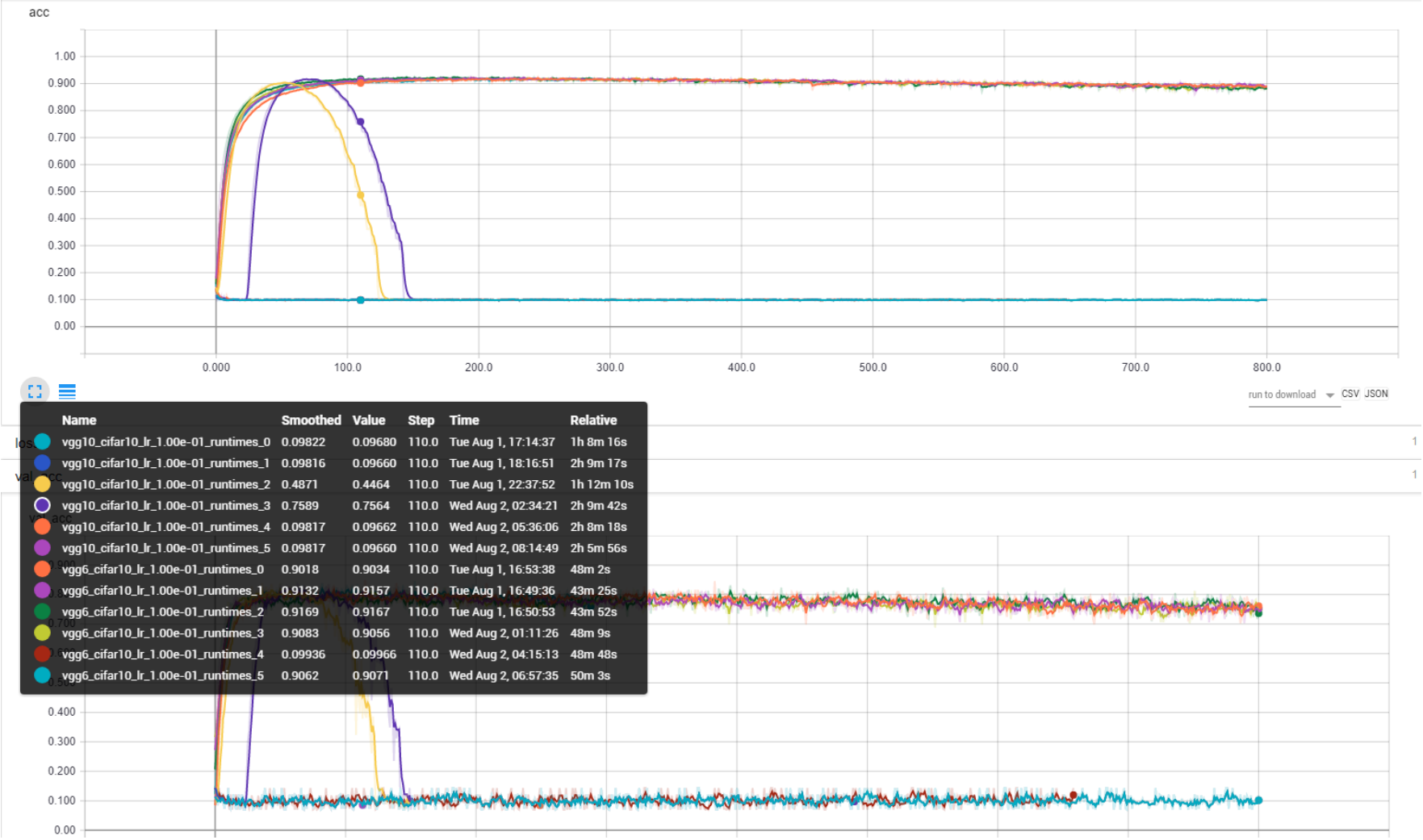
vgg6_cifar10_lr_1.00e-01	0.9102	0.9101	175.0	Sat Jul 29, 00:27:18	1h 7m 50s
vgg6_cifar10_lr_1.00e-02	0.9696	0.9697	174.0	Sat Jul 29, 00:27:22	1h 7m 36s
vgg6_cifar10_lr_1.00e-03	0.7022	0.7022	172.0	Sat Jul 29, 00:27:17	1h 7m 2s
vgg6_cifar10_lr_1.00e-04	0.3894	0.3895	165.0	Sat Jul 29, 00:27:24	1h 6m 43s
vgg6_cifar10_lr_1.00e-05	0.1421	0.1424	179.0	Sat Jul 29, 00:27:28	1h 6m 16s
vgg6_cifar10_lr_1.47e-02	0.2204	0.2204	0.000	Sat Jul 29, 04:19:55	0s
vgg6_cifar10_lr_3.16e-02	0.2476	0.2476	0.000	Sat Jul 29, 04:14:35	0s
vgg6_cifar10_lr_3.16e-03	0.1323	0.1323	0.000	Sat Jul 29, 04:32:08	0s
vgg6_cifar10_lr_6.81e-03	0.1800	0.1800	0.000	Sat Jul 29, 04:31:15	0s









Name	Smoothed	Value	Step	Time	Relative
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vgg10_cifar10_lr_1.00e-01_runtimes_1	0.09816	0.09660	110.0	Tue Aug 1, 18:16:51	2h 9m 17s
vgg10_cifar10_lr_1.00e-01_runtimes_2	0.4871	0.4464	110.0	Tue Aug 1, 22:37:52	1h 12m 10s
vgg10_cifar10_lr_1.00e-01_runtimes_3	0.7589	0.7564	110.0	Wed Aug 2, 02:34:21	2h 9m 42s
vgg10_cifar10_lr_1.00e-01_runtimes_4	0.09817	0.09662	110.0	Wed Aug 2, 05:36:06	2h 8m 18s
vgg10_cifar10_lr_1.00e-01_runtimes_5	0.09817	0.09660	110.0	Wed Aug 2, 08:14:49	2h 5m 56s
vgg6_cifar10_lr_1.00e-01_runtimes_0	0.9018	0.9034	110.0	Tue Aug 1, 16:53:38	48m 2s
vgg6_cifar10_lr_1.00e-01_runtimes_1	0.9132	0.9157	110.0	Tue Aug 1, 16:49:36	43m 25s
vgg6_cifar10_lr_1.00e-01_runtimes_2	0.9169	0.9167	110.0	Tue Aug 1, 16:50:53	43m 52s
vgg6_cifar10_lr_1.00e-01_runtimes_3	0.9083	0.9056	110.0	Wed Aug 2, 01:11:26	48m 9s
vgg6_cifar10_lr_1.00e-01_runtimes_4	0.09936	0.09966	110.0	Wed Aug 2, 04:15:13	48m 48s
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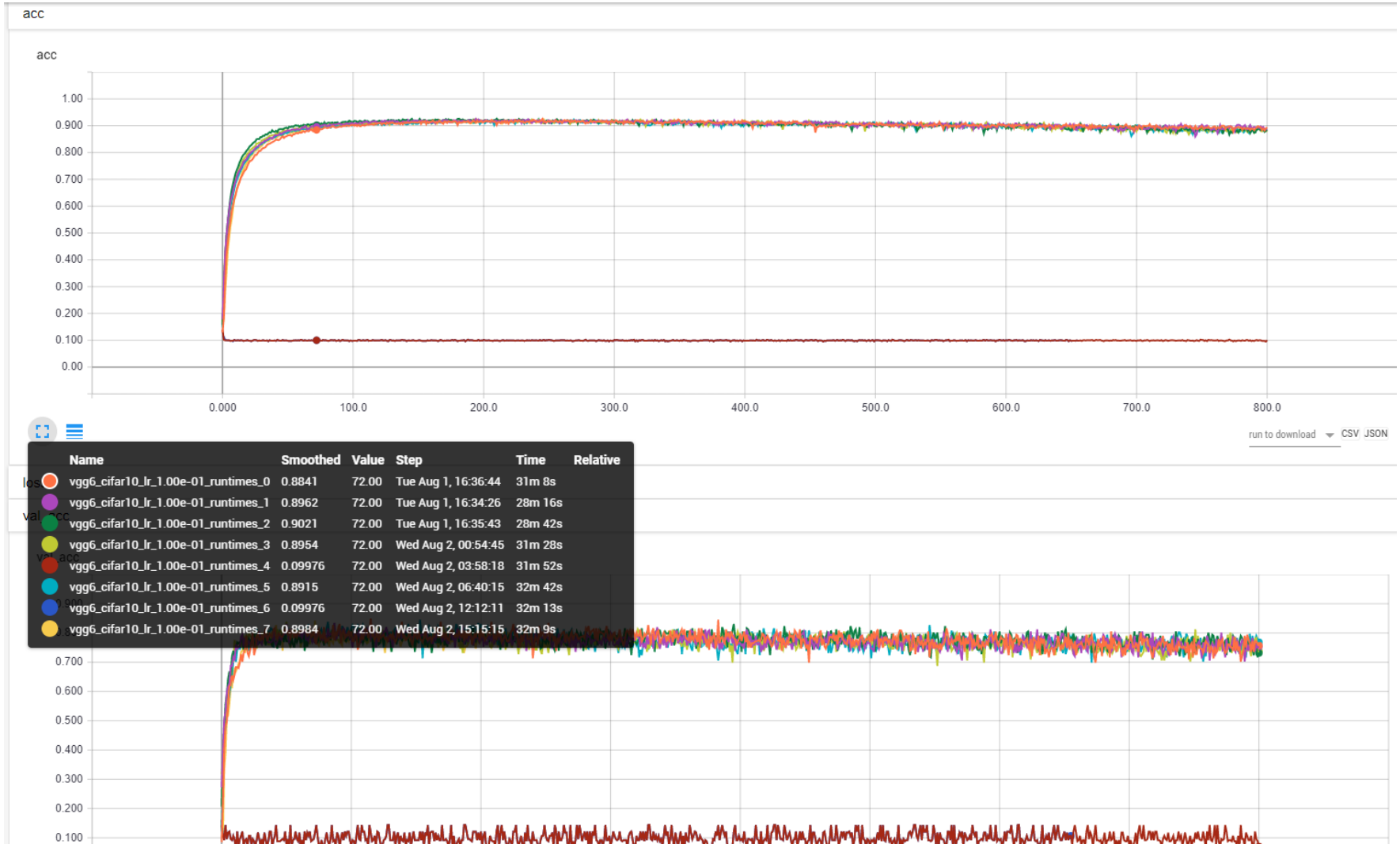
acc
acc
1.00
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.00
0.000
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
run to download
CSV JSON
Name Smoothed Value Step Time Relative
vgg6_cifar10_lr_1.00e-01_runtimes_0 0.8841 72.00 Tue Aug 1, 16:36:44 31m 8s
vgg6_cifar10_lr_1.00e-01_runtimes_1 0.8962 72.00 Tue Aug 1, 16:34:26 28m 16s
vgg6_cifar10_lr_1.00e-01_runtimes_2 0.9021 72.00 Tue Aug 1, 16:35:43 28m 42s
vgg6_cifar10_lr_1.00e-01_runtimes_3 0.8954 72.00 Wed Aug 2, 00:54:45 31m 28s
vgg6_cifar10_lr_1.00e-01_runtimes_4 0.09976 72.00 Wed Aug 2, 03:58:18 31m 52s
vgg6_cifar10_lr_1.00e-01_runtimes_5 0.8915 72.00 Wed Aug 2, 06:40:15 32m 42s
vgg6_cifar10_lr_1.00e-01_runtimes_6 0.09976 72.00 Wed Aug 2, 12:12:11 32m 13s
vgg6_cifar10_lr_1.00e-01_runtimes_7 0.8984 72.00 Wed Aug 2, 15:15:15 32m 9s
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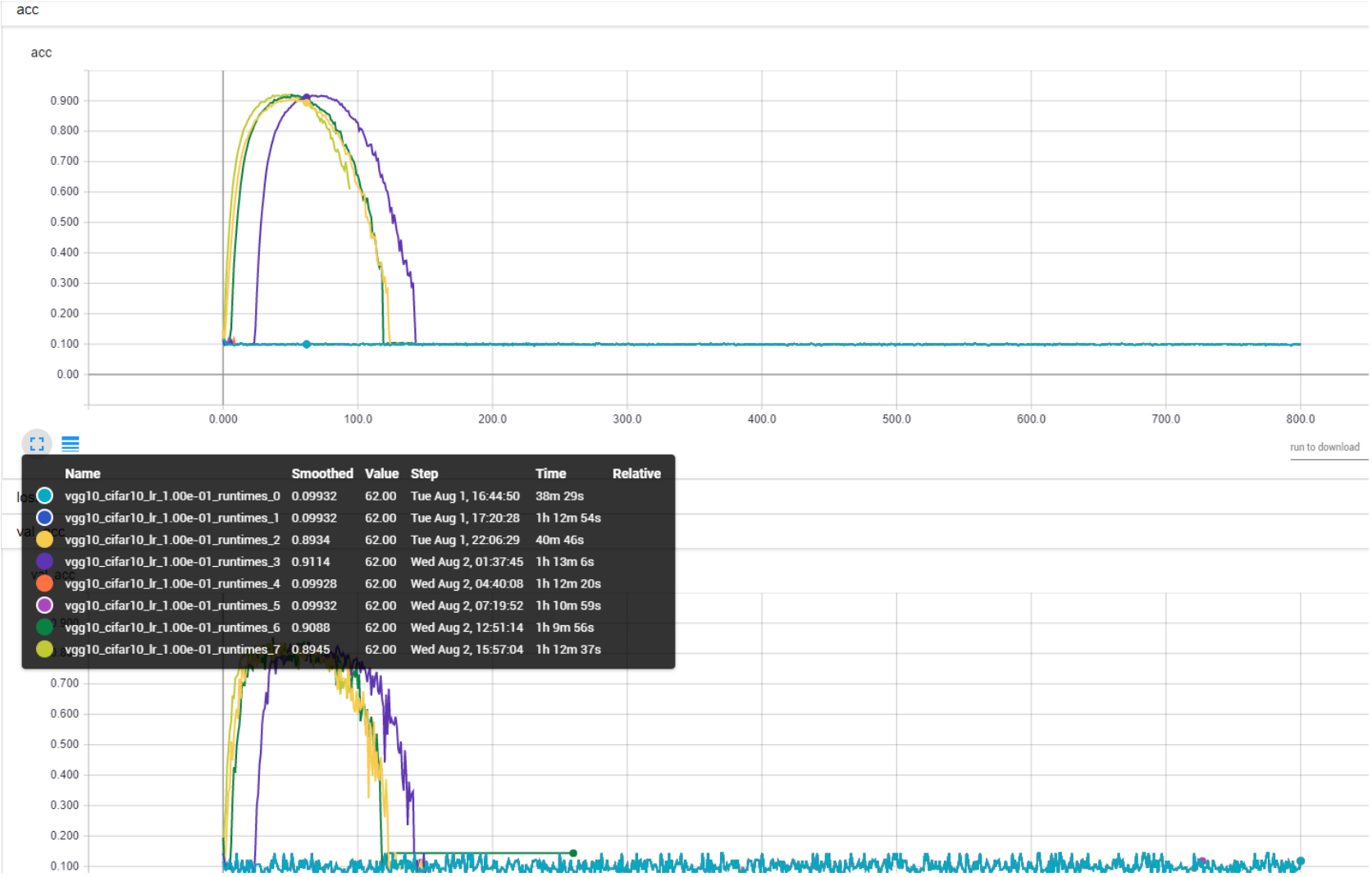
0.600
0.500
0.400
0.300
0.200
0.100


acc
acc
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0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.00
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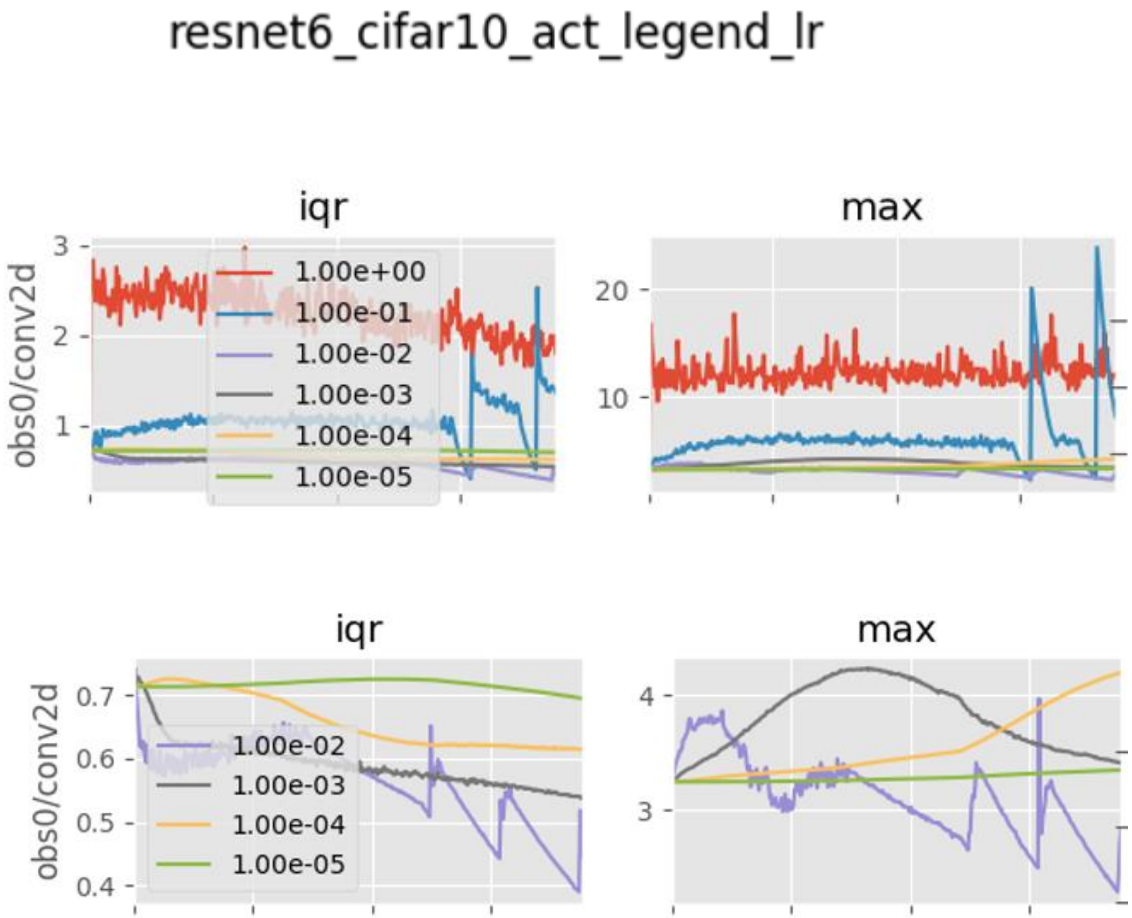
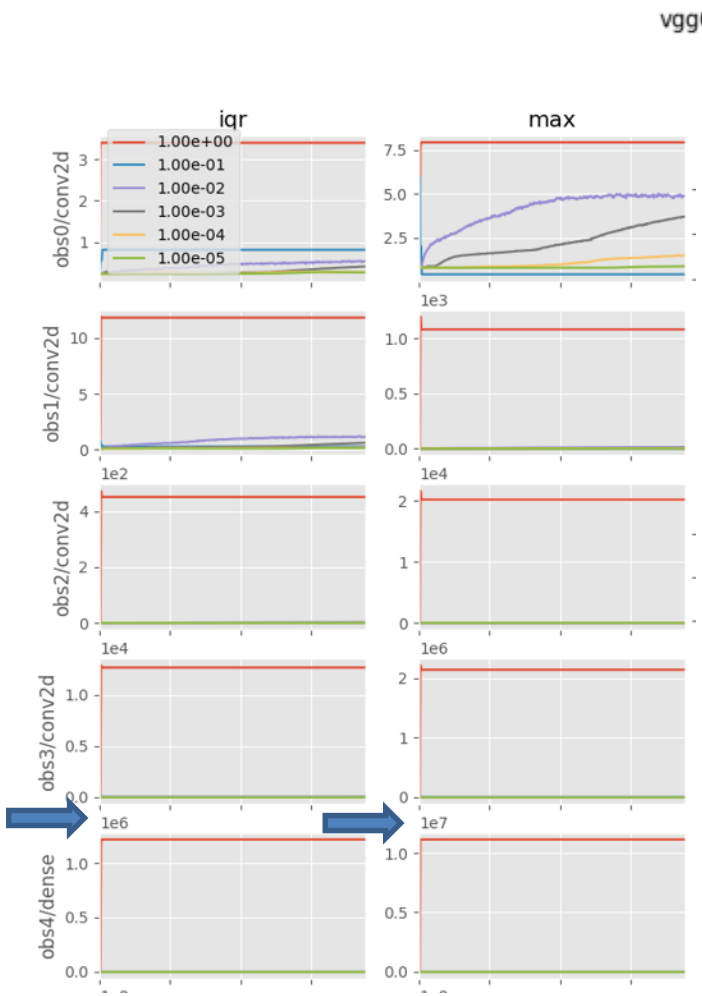
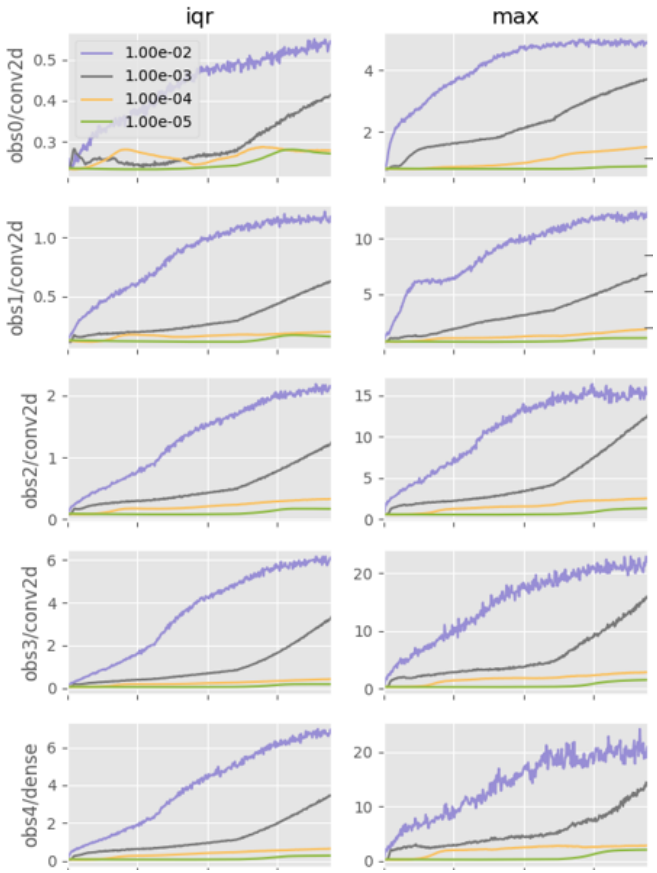
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
run to download
Name Smoothed Value Step Time Relative
vgg10_cifar10_lr_1.00e-01_runtimes_0 0.09932 62.00 Tue Aug 1, 16:44:50 38m 29s
vgg10_cifar10_lr_1.00e-01_runtimes_1 0.09932 62.00 Tue Aug 1, 17:20:28 1h 12m 54s
vgg10_cifar10_lr_1.00e-01_runtimes_2 0.8934 62.00 Tue Aug 1, 22:06:29 40m 46s
vgg10_cifar10_lr_1.00e-01_runtimes_3 0.9114 62.00 Wed Aug 2, 01:37:45 1h 13m 6s
vgg10_cifar10_lr_1.00e-01_runtimes_4 0.09928 62.00 Wed Aug 2, 04:40:08 1h 12m 20s
vgg10_cifar10_lr_1.00e-01_runtimes_5 0.09932 62.00 Wed Aug 2, 07:19:52 1h 10m 59s
vgg10_cifar10_lr_1.00e-01_runtimes_6 0.9088 62.00 Wed Aug 2, 12:51:14 1h 9m 56s
vgg10_cifar10_lr_1.00e-01_runtimes_7 0.8945 62.00 Wed Aug 2, 15:57:04 1h 12m 37s
0.700
0.600
0.500
0.400
0.300
0.200
0.100

Problem: Range



Problem: Extrema