Practical Deep Learning: Experiments

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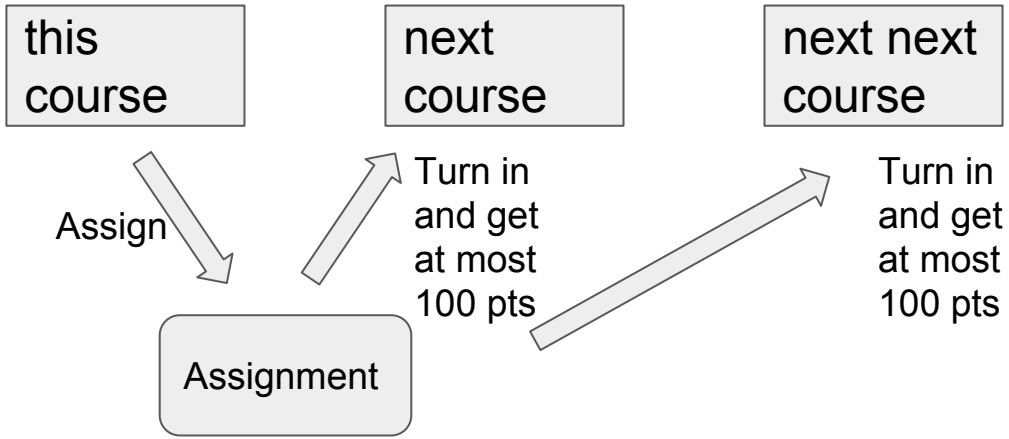
Course Logistics

Life of an Assignment



Get assignments at https://github.com/PeiqinSun/tf-tutorials
Discuss at https://github.com/PeiqinSun/tf-tutorials/issues

Formats of turn-ins

- Upload at http://39.104.61.196:8000/
- File Name
  - '{}_{}.tar'.format(assignment_number, 学号)
- Content of the tar ball
  - Different per assignments, follow instructions therein.
  - Example: https://github.com/PeiqinSun/tf-tutorials/blob/master/01-svhn/Homework%201.md

GPU Server

- Neither required nor assumed for finishing assignments
  - For SVHN experiments, can tweak use_extra_data in "config" to exclude "extra_32x32.mat" to make training fast enough on CPU
- Leave them to those who are in need
  - By survey 50% of attendees don't have GPU
- Dockers with GPUs are provided

Good Practices in Experiments

Systematic naming of experiments

- Naming
  - 中浙优8号
    - 中稻, 浙江产, 优, 8号
  - 隆平稻 (reserved for exceptional good ones)
    - serve to shorten name
- config/quarter_fc_noepsilon_nodupe/model.py
  - quarter_fc: FC only has quarter size of the original
  - noepsilon + nodupe: remove epsilon and dupes in labels before matching

```
Feb 13 10:43 03-SVHN.base
Feb 13 10:46 03-SVHN.base.abs_max
Feb 13 10:52 03-SVHN.base.nonneg_max
Feb 13 10:53 03-SVHN.base.square_max
Feb 13 10:58 03-SVHN.base.square_max.no_drop_out
Feb 13 11:02 03-SVHN.base.lb_abs_max
Feb 13 11:07 03-SVHN.base.plus_one_abs_max
Feb 13 11:26 03-SVHN.base.abs_max.regression
Feb 13 11:30 03-SVHN.base.minus_weight_decay
Feb 13 11:32 03-SVHN.base.minus_weight_decay_x10
Feb 13 11:42 03-SVHN.base.regression
Feb 13 11:43 03-SVHN.base.abs_regression
Feb 13 11:56 03-SVHN.base.logplus_before_softmax
Feb 14 09:44 03-SVHN.base.auto_encoder
Feb 14 10:19 03-SVHN.base.auto_encoder.tanh.maxout
Feb 14 10:21 03-SVHN.base.auto_encoder.tanh.pool
Feb 14 11:53 03-SVHN.base.auto_encoder.tanh.all_conv
Feb 14 11:53 03-SVHN.base.auto_encoder.tanh
Feb 14 11:53 03-SVHN.base.auto_encoder.tanh.all_conv.shallow
```

Benefits of Systematic Naming

- Easy tracking of progress
- Automatic Ablation Study
- Keep records of "wrong" experiments and their descendants
- Allow combining multiple experiments for good

Good practices: work logs for experiments

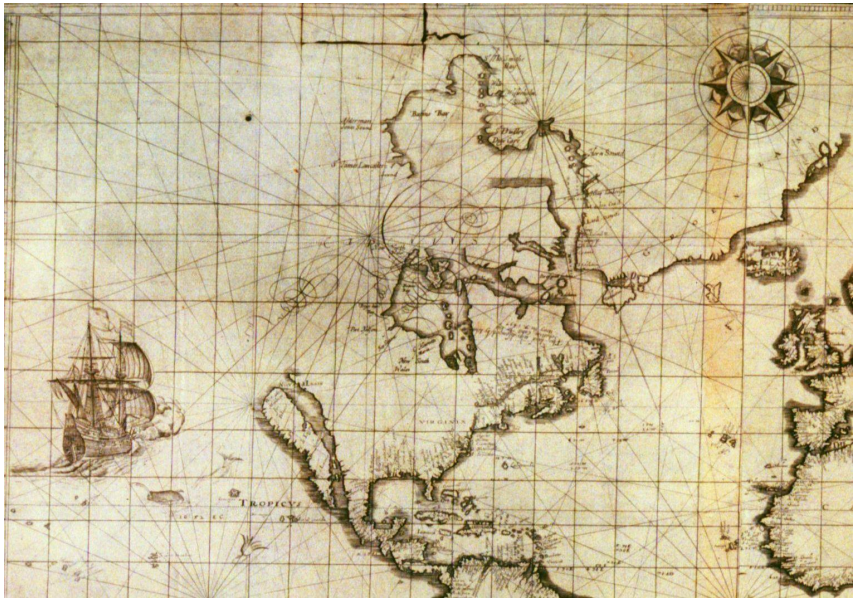
"感谢贵司带给我记worklog的好习惯...超级受用"

-- Dieqiao Feng (Cornell PhD candidate, NOI Gold medalist (ranked 1st))

"诚心求带娃worklog"

-- Yuxin Wu (Facebook research scientist)

Work log for record

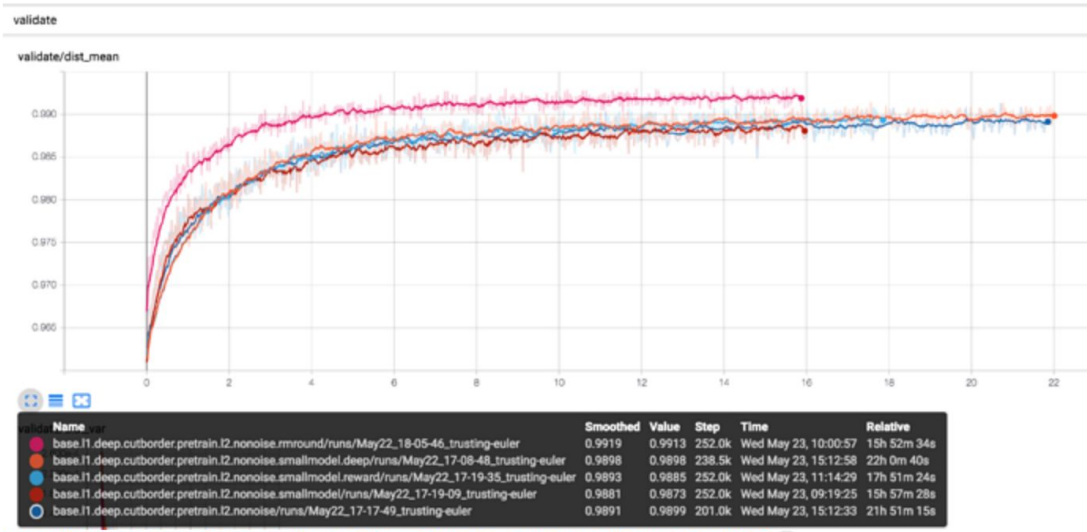


- The way Colombus discovers America
- Scripts:
  - Monitoring progress
    - watch "python neupeak/scripts/gen_work_log.**sh** train_log/log.txt|tail"
  - Producing record
    - neupeak/scripts/gen_work_log.**py** train_log/log.txt

Sample work log

- Curves and notes
- Opinions, conjectures
- Plans and actions

huangzhewei 18年5月



https://git-core.megvii-inc.com/huangzhewei/stroke_extraction/tree/master/063 2

粉色是把 (resize 后的 mnist round 一下) 这个步骤去掉，但其实结果看起来类似

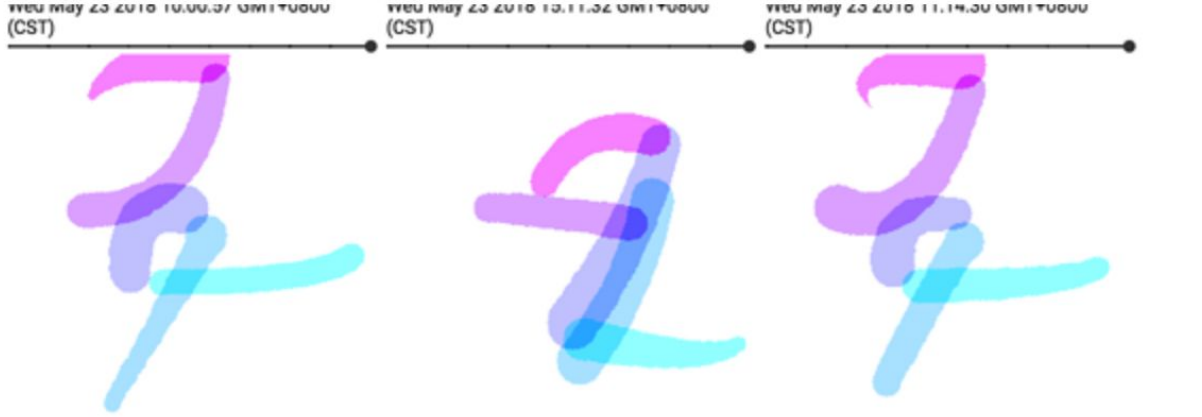
以深蓝为 base， 红色是把模型参数改少，橙色是再加深一些

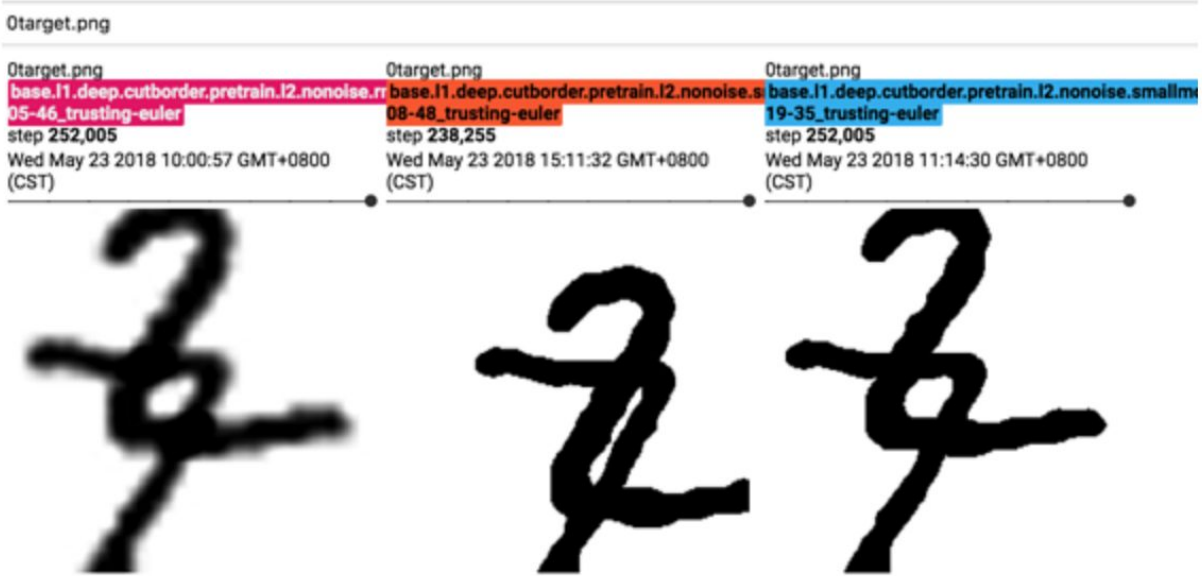
浅蓝是把 reward 放缩一下使得 Q 更接近 1

深网络的稳定性好，validate_reward 方差小 20 %

Visualizations

- Identify problems
- Illustrating progresses





Work philosophy

- Never stare at training process unless for MNIST
  - doing training asynchronously
- Find a quick numeric way to check result
  - a bad metric is better than no metric
  - or define a tiny representative set (that can be human-eval'ed in <1minute)
- Check before sleep whether the job is alive
  - Check if consuming too much memory
  - Check deadlock

每天工作时间安排

时　间	工作安排
08:30～09:00	开新反应A　　（黄金30分）
09:00～15:00	反应后处理和产品纯化（过夜反应和反应A）
15:00～16:00	开过夜反应B　　（关键）
16:00～17:00	制定次日反应方案，准备反应所需材料。

Work Philosophy: Parallel experiments