

structured learning Approach. (产生从观察到的复杂事物，如一张图片，一首诗)

Bottom Up : Learn to generate the object at the component level. (Generator)

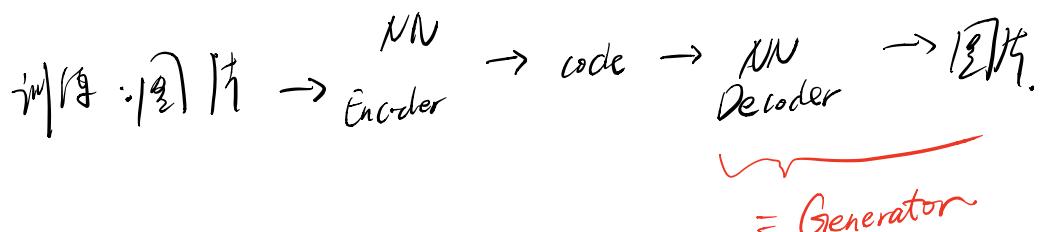
G&N ← +

Top Down. evaluating the whole object and find the best one. (Discriminator)

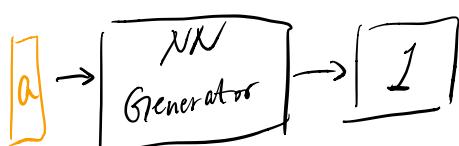
问题1: Generator 可以自己学习吗？ 可以

但难以生成标签。

通过 Auto-encoder.



但仍然有问题。

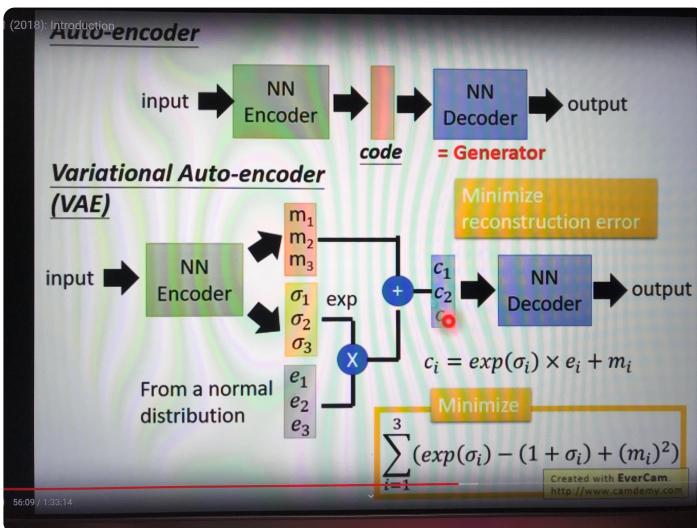


$$0.5 \times [a] + 0.5 \times [b] \rightarrow \boxed{\text{NN Generator}} \rightarrow ?$$

解决方案：（提高稳定性）

并不是 $\boxed{1}$

可能是 noise.



但是有问题：各 component 相对独立



是可以解决这个问题的

但需要更深的网络消除这种独立。

问题2. Discriminator 会 generate 什么？ 问

答：It's easier to catch the relation between the components by top-down evaluation

Generate object \tilde{x} that

$$\tilde{x} = \arg \max D(x) \quad \begin{array}{l} \text{穷举所有 } x \\ \text{取最高分的} \end{array}$$

就算穷举有可能。

但为了训练 discriminator，样本上并没有 negative example.

难以产生好的 negative example.

Generator v.s. Discriminator

<ul style="list-style-type: none">• <u>Generator</u>• Pros:<ul style="list-style-type: none">• Easy to generate even with deep model• Cons:<ul style="list-style-type: none">• Imitate the appearance• Hard to learn the correlation between components	<ul style="list-style-type: none">• <u>Discriminator</u>• Pros:<ul style="list-style-type: none">• Considering the big picture• Cons:<ul style="list-style-type: none">• Generation is not always feasible<ul style="list-style-type: none">• Especially when your model is deep• How to do negative sampling?
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Created with EverCam
<http://www.camdemyc.com>

15.2 Generator + Discriminator

Generate negative examples by discriminator D .

$$\boxed{G \rightarrow \tilde{x}} = \boxed{\tilde{x} = \arg \max D(x)}$$



现在用 generator 从

过 En 的是各种正负的这个方程.