Seq2Seq

Generation

distribution of tokens : sample / argmax

① text

$h \rightarrow [f] \rightarrow h'$

y ↑

x word vec

$x^1 = <BOS>$

$y^1: p(w|<BOS>)$

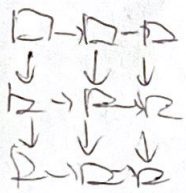
$y^2: p(w|<BOS>, h_1', x^2)$

until <EOS> is generated.

② image

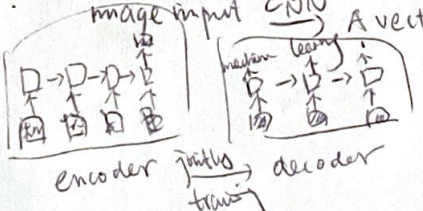
sequence: blue red yellow grey

PixelRNN

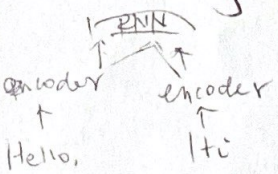


Conditional generation: 不想要 simply generate some random sentences.

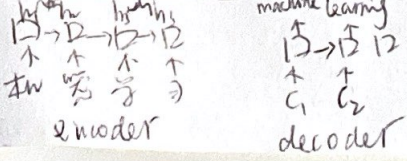
- Caption generation.
- Chatbot/Translation



A caption / sequence: vector, vector, ... (some vector)

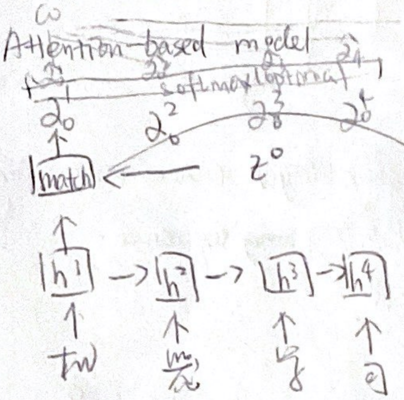


Dynamic conditional generation (attention-based) 一个 vector 去表示一个 document 可能不能完全表达意思

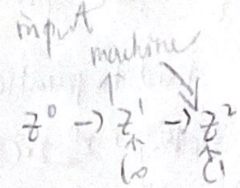


Machine Translation

~~Attention-based model~~



$c^0 = \sum \hat{\alpha}_0^i h^i$: decoder input



Design by yourself

options

① $\cos(z, h)$

② small NN → scalar

③ $\alpha = h^T W z$

↑ trained together

Video caption 每一帧 train 出来一个词的 vector → decoder → 一句完整的话

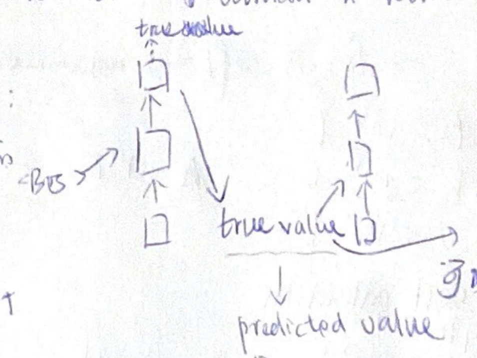
Tips: ① regularization → Good attention: 每一个 frame attention weight 总和相同 (τ)

$$\sum_i \left(\tau - \sum_t \alpha_t^i\right)^2$$

① bad attention: ✗ woman ✗ woman

② mismatch between train & test:

(Exposure bias)



The inputs are reference — train

A → B → B

比如 B → A → A

第2个B是在B条件下得到的

why not predicted?

可以但很难 train 起来，很不稳定

The inputs are the outputs of the last time step — test

如果第一步犯错，后面的以错 (first B reverse in training)

②' training: Scheduled sampling — from model or from reference. B

直接丢 distribution → 概率动态决定 一开始 reference 概率较高

②'' testing: beam search → I are / You are 若 $p(I) \approx p(You)$

③ object level vs component level

object-level criterion: $R(y, \hat{y})$ → gradient descent?

不能 → reinforcement learning