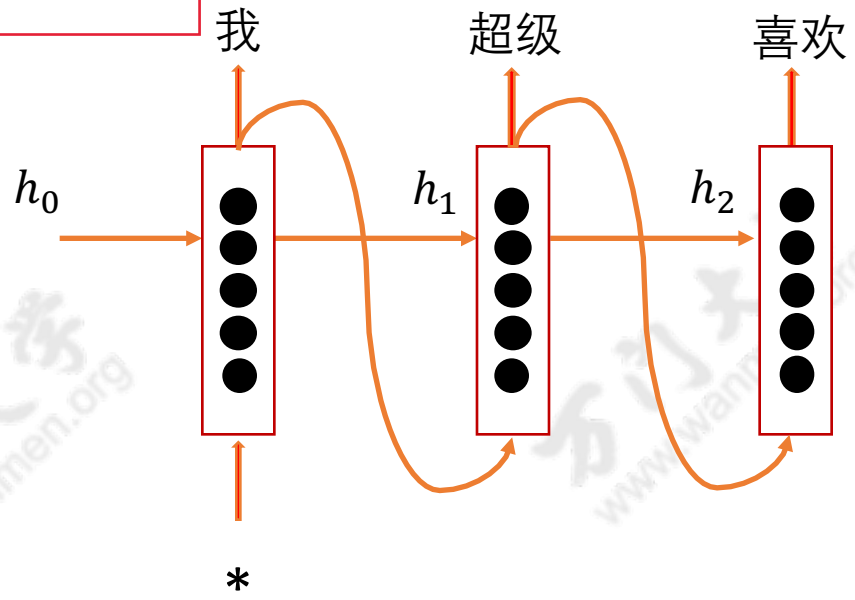
4 递归神经网络的应用

RNN Applications: Text Generation

递归神经网络的应用: 文本生成

Text Generation:
Input: Single Token
Output: Multiple Tokens

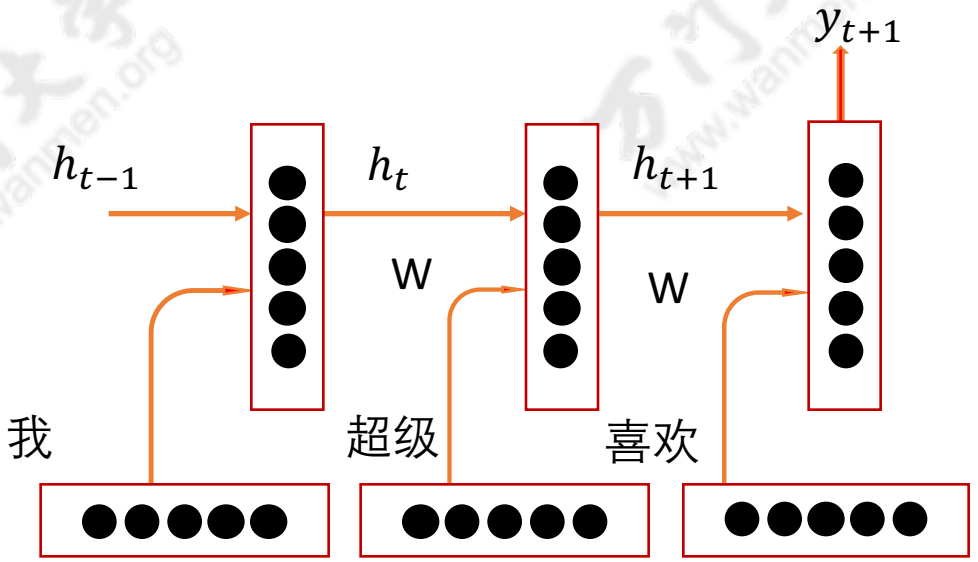


RNN Applications: Sentiment Analysis

递归神经网络的应用: 情绪分析

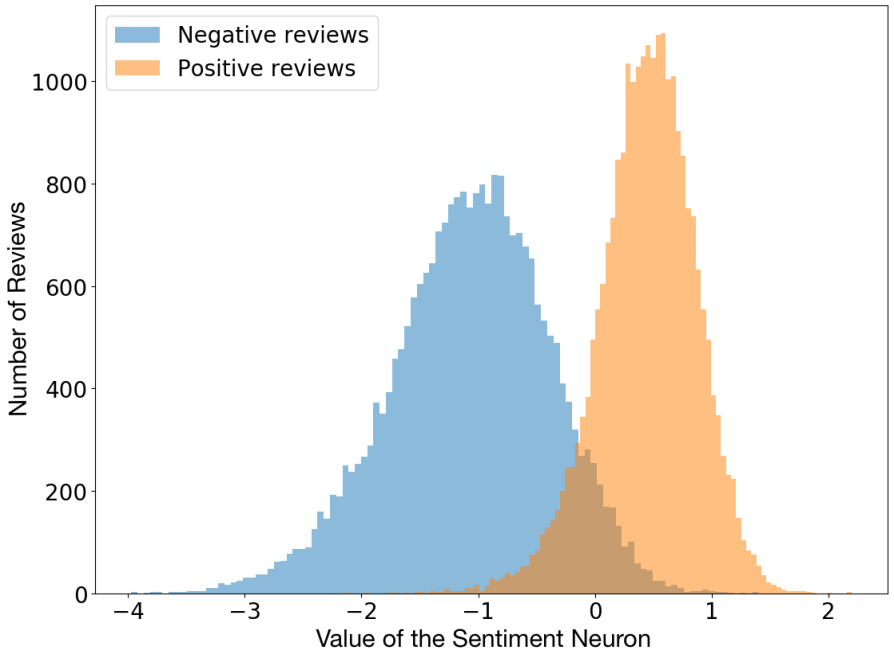
Sentiment Analysis:
Input: Multiple Tokens
Output: Single Output (class)

- “我超级喜欢晓理的课”
- “这部电影拍得太糟糕了”
- “总体来说, 小说的前半部分比较拖沓, 但后部分非常出彩, 强烈推荐”
- …



RNN Applications: Sentiment Neuron

递归神经网络的应用: 情绪神经元

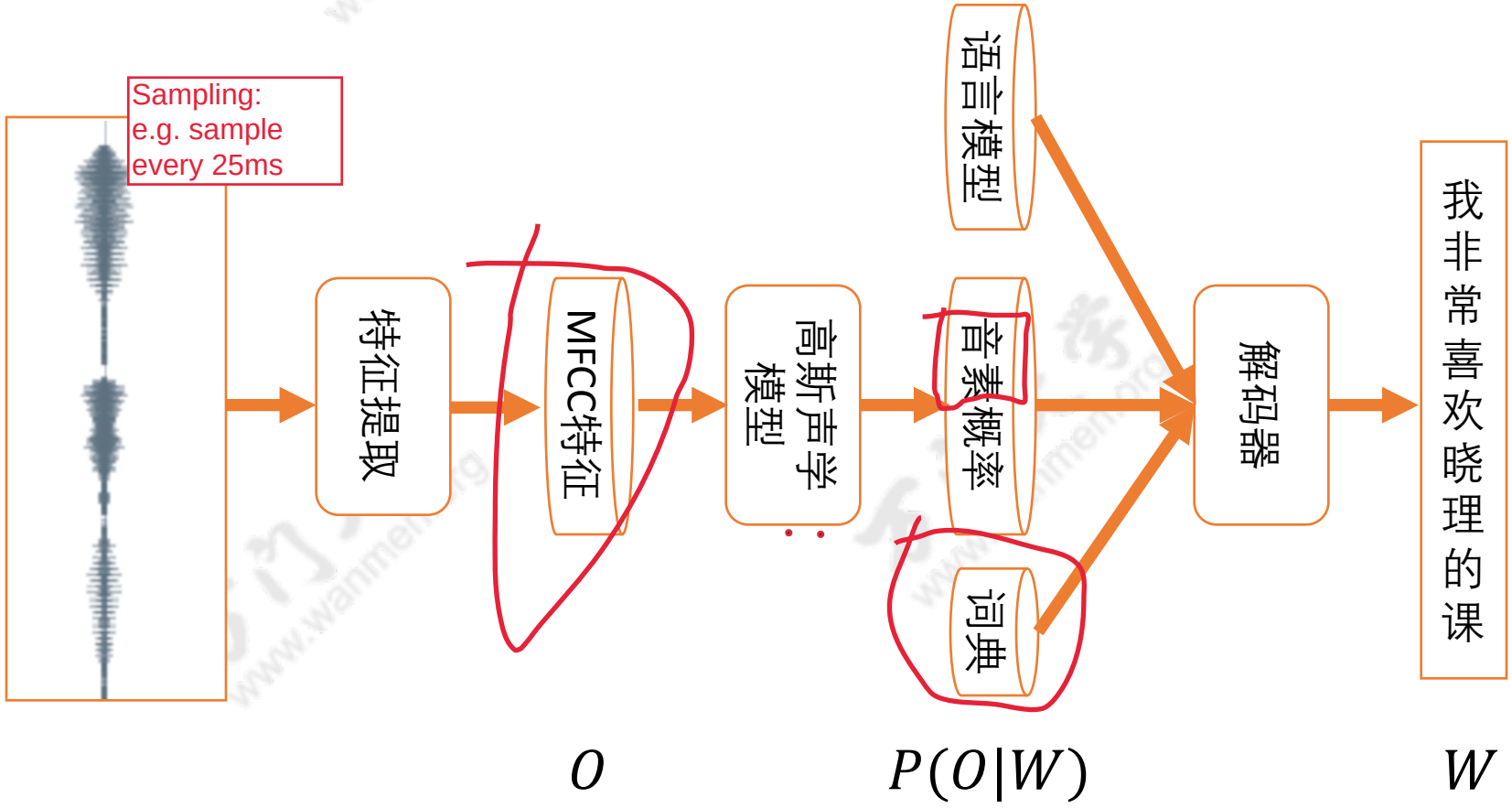


This is one of Crichton's best books. The characters of Karen Ross, Peter Elliot, Munro, and Amy are beautifully developed and their interactions are exciting, complex, and fast-paced throughout this impressive novel. And about 99.8 percent of that got lost in the film. Seriously, the screenplay AND the directing were horrendous and clearly done by people who could not fathom what was good about the novel. I can't fault the actors because frankly, they never had a chance to make this turkey live up to Crichton's original work. I know good novels, especially those with a science fiction edge, are hard to bring to the screen in a way that lives up to the original. But this may be the absolute worst disparity in quality between novel and screen adaptation ever. The book is really, really good. The movie is just dreadful.

Learning to Generate Reviews and Discovering Sentiment

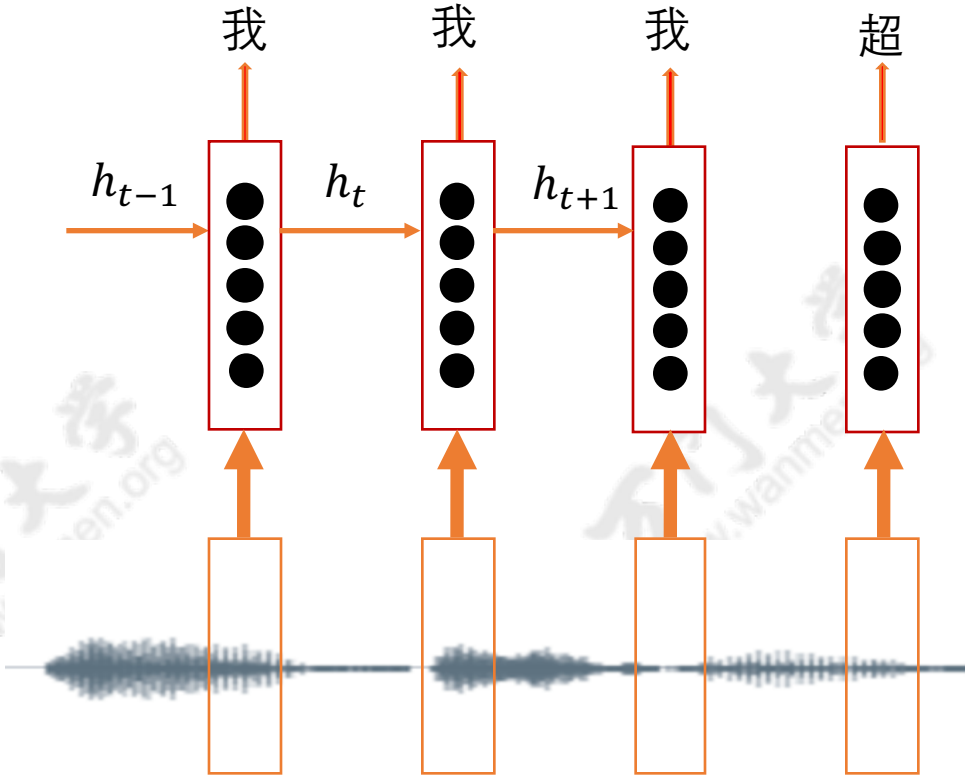
RNN Applications: Speech Recognition

递归神经网络的应用: 语音识别



RNN Applications: Speech Recognition

递归神经网络的应用: 语音识别



Speech Recognition: CTC

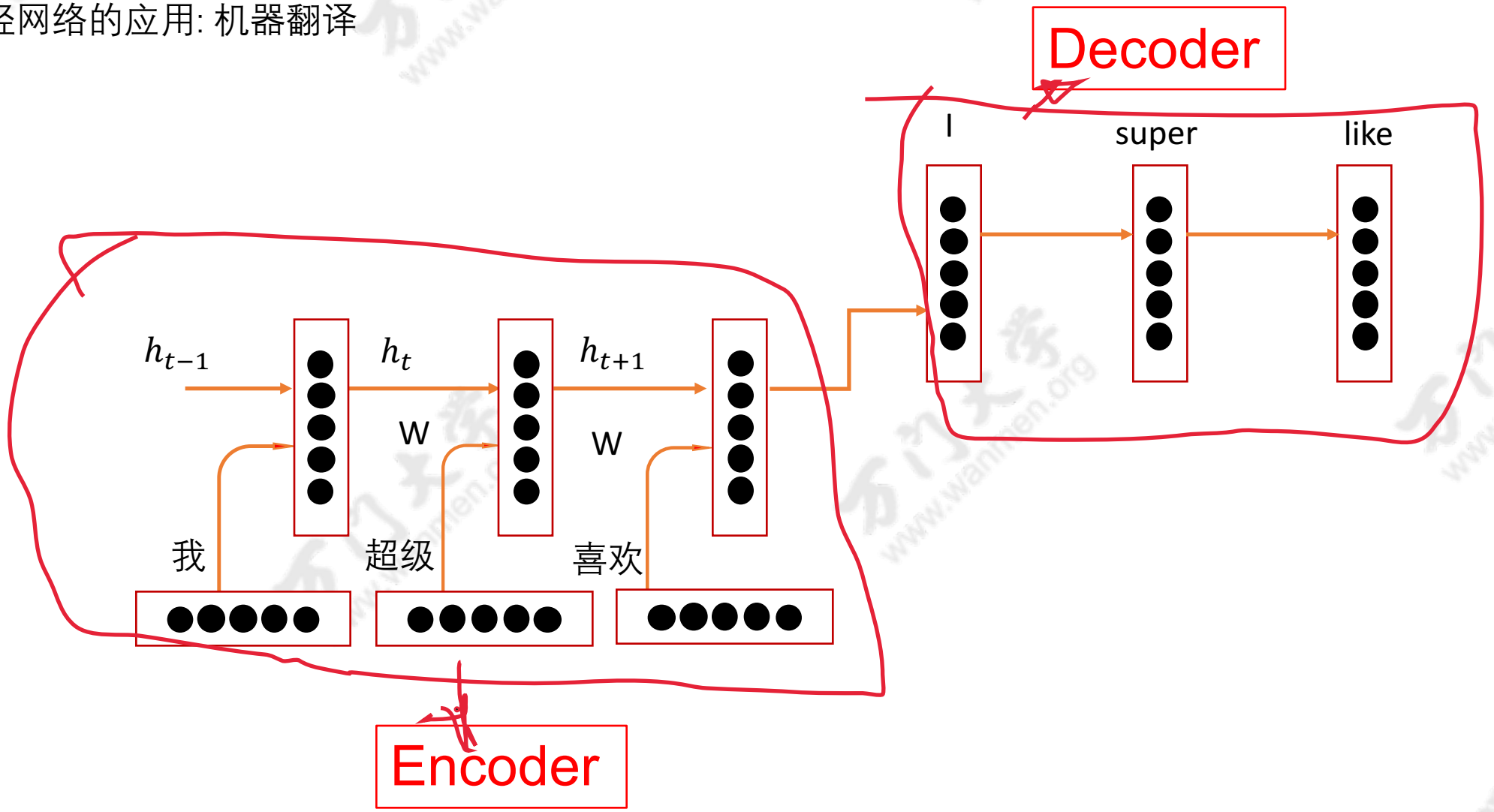
语音识别:

Connectionist Temporal Classification:
By adding dummy variable to fill in the break/blanks between two words.

Similarly, OCR also used this technology.

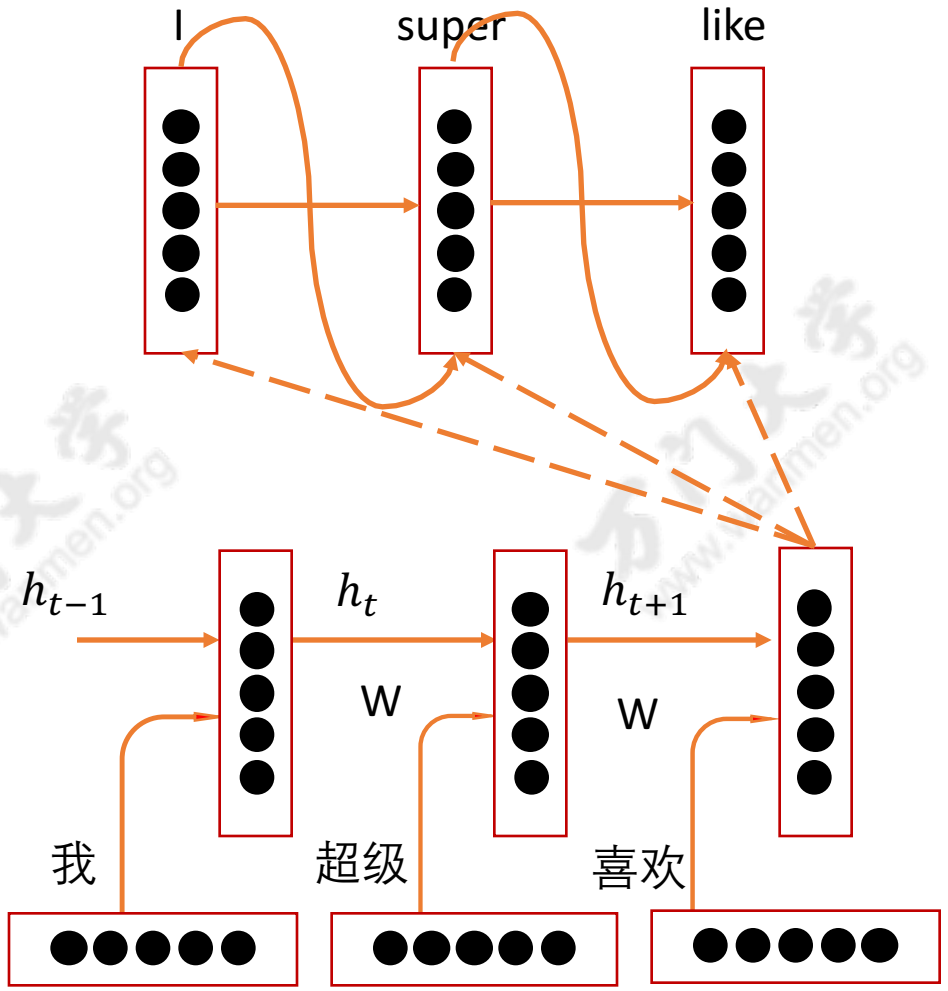
RNN Applications: Machine Translation

递归神经网络的应用: 机器翻译



RNN Applications: Machine Translation

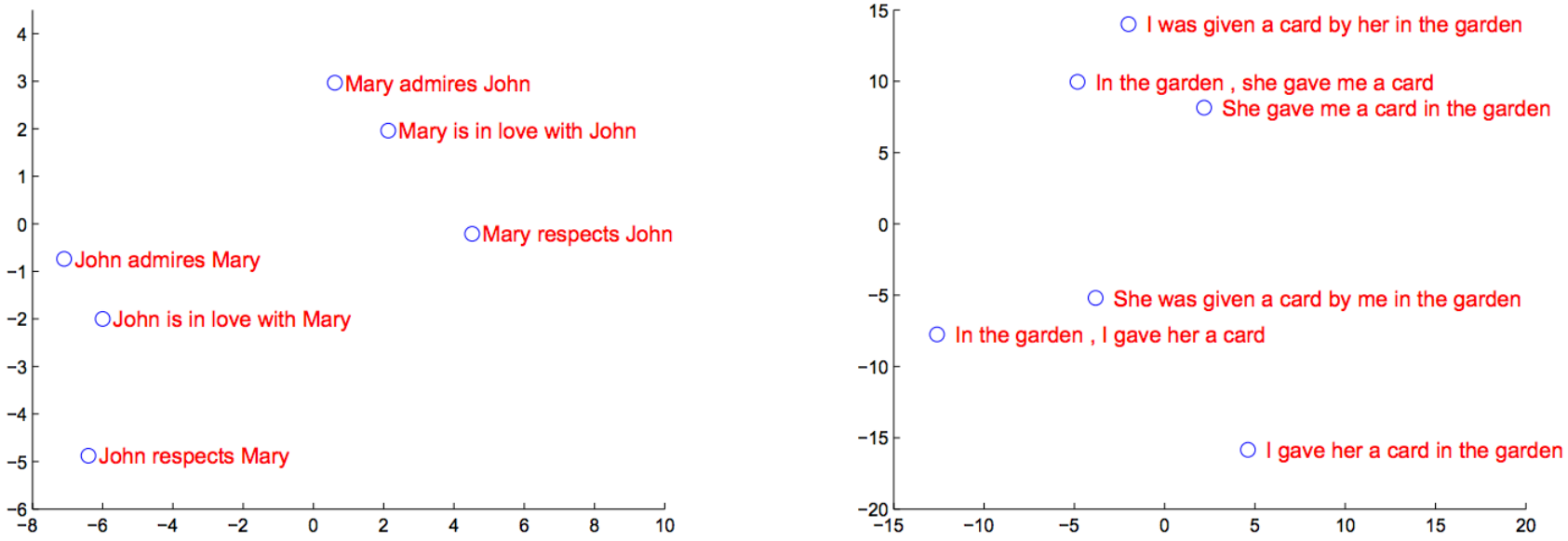
递归神经网络的应用: 机器翻译



RNN Applications: Machine Translation

递归神经网络的应用: 机器翻译

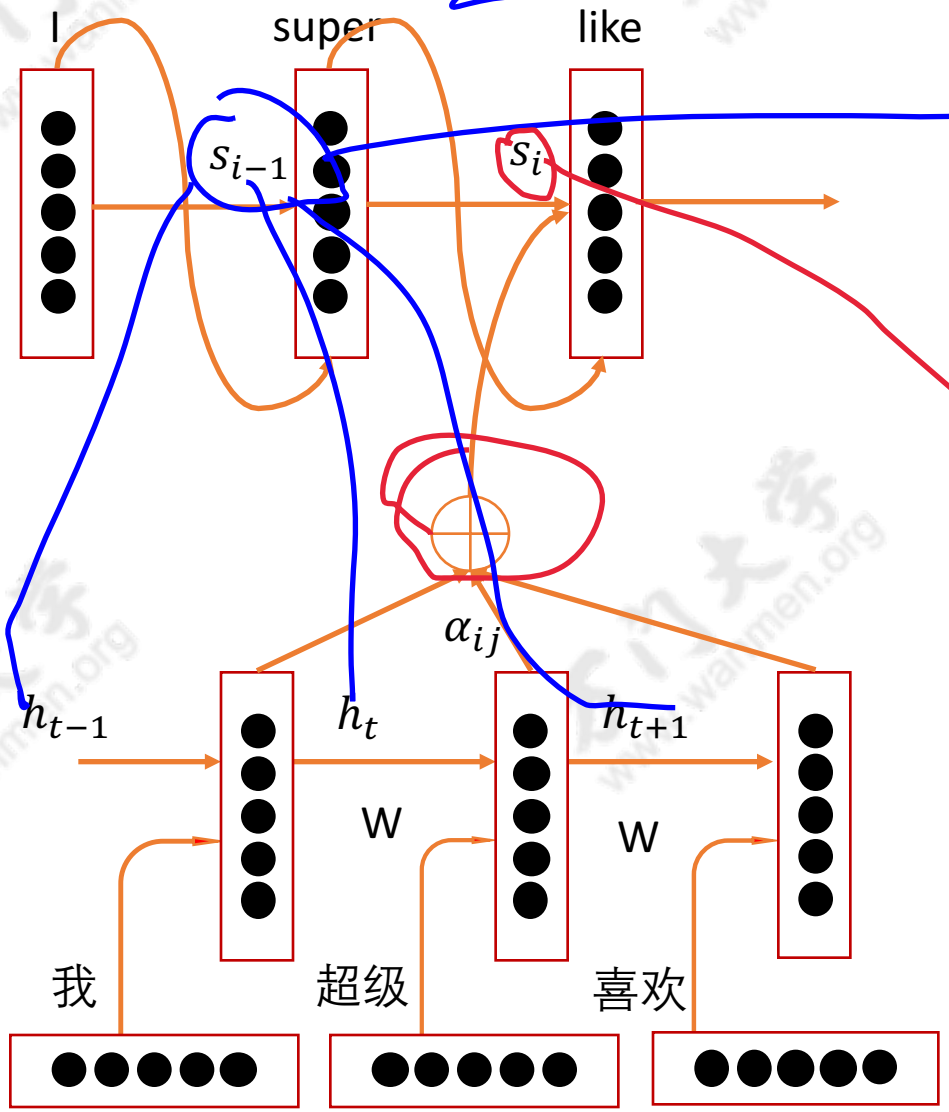
- 解码器只依赖与编码器的最后一个hidden state的向量, 编码器只等价于一个sentence embedding



Sequence to Sequence Learning with Neural Networks

RNN Applications: Attention

递归神经网络的应用: 注意力机制



alignment model

$$e_{ij} = a(s_{i-1}, h_j)$$

$$\alpha_{ij} = \frac{\exp(e_{ij})}{\sum_{k=1}^{T_x} \exp(e_{ik})}$$

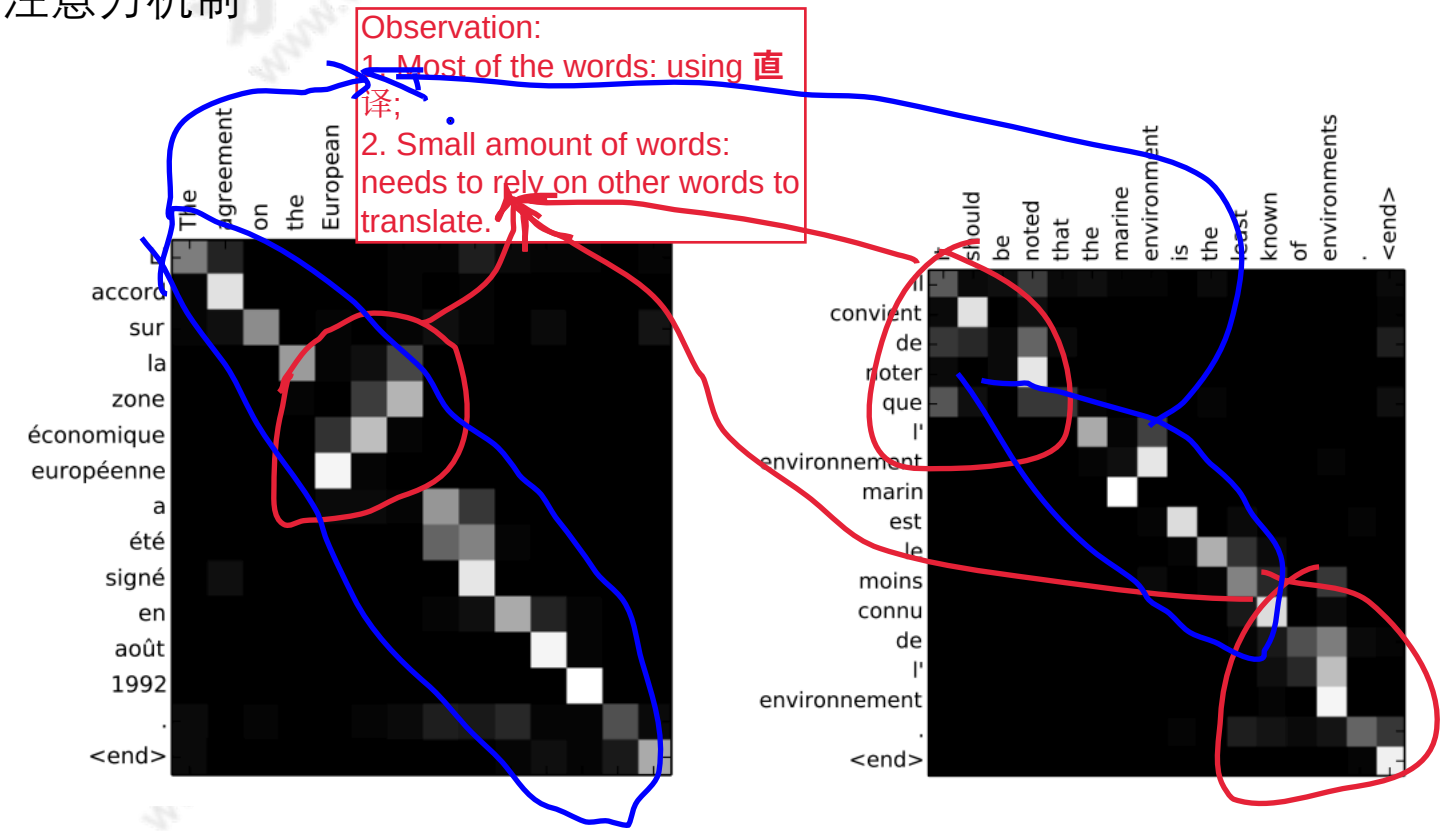
$$c_i = \sum_{j=1}^{T_x} \alpha_{ij} h_j$$

$$s_i = f(s_{i-1}, y_{i-1}, c_i)$$

Neural machine translation by jointly learning to align and translate

RNN Applications: Attention

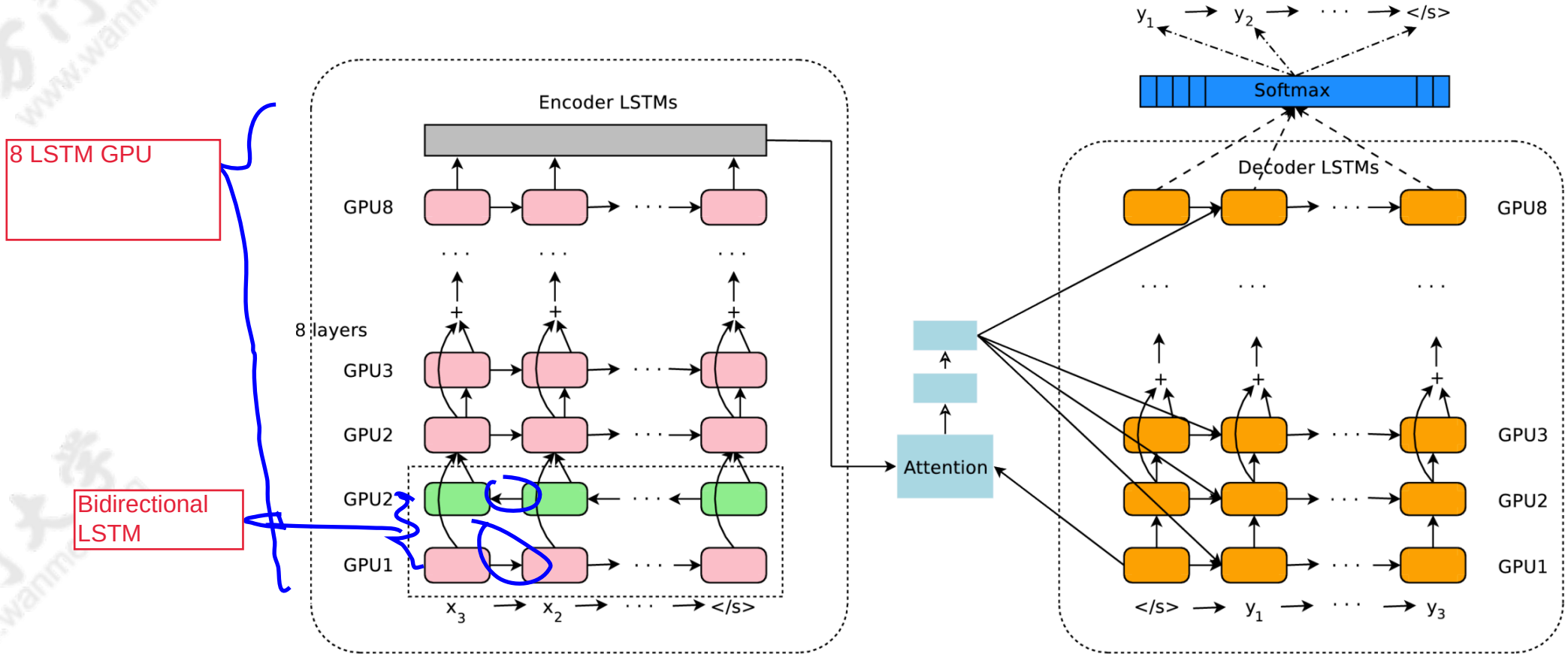
递归神经网络的应用: 注意力机制



Neural machine translation by jointly learning to align and translate

RNN Applications: Machine Translation

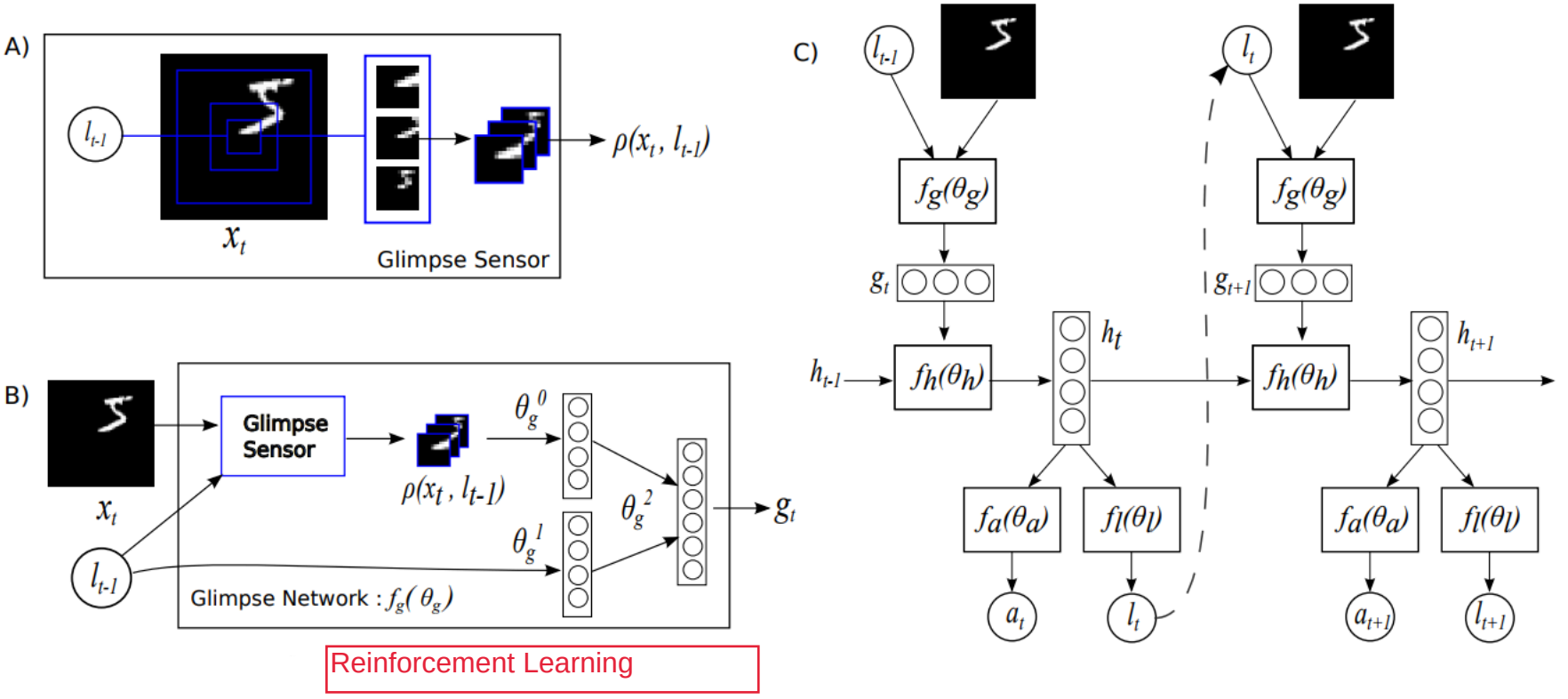
递归神经网络的应用: 机器翻译



Google's Neural Machine Translation System: Bridging the Gap between Human and Machine Translation

RNN Applications: Visual Attention

递归神经网络的应用: 视觉注意力机制



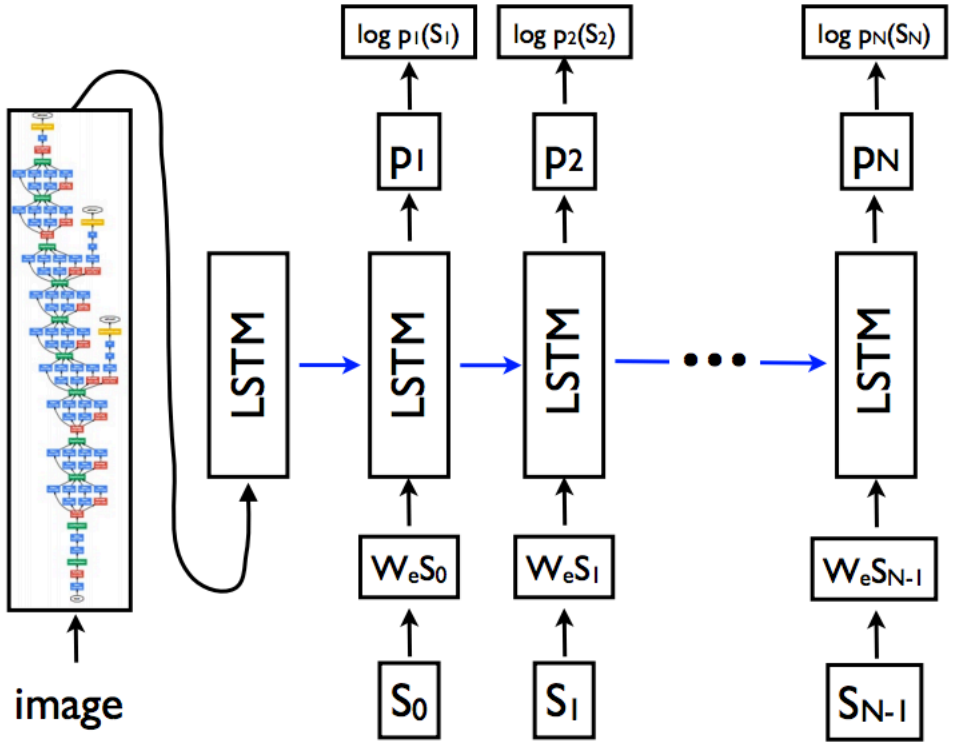
Reinforcement Learning

Recurrent Models of Visual Attention

RNN Applications: Image Caption

Input: Single (1 image)
Output: Multiplt (multiple words - a sentence: describing this image)

递归神经网络的应用:[redacted]



Show and Tell: A Neural Image Caption Generator

RNN Applications: Visual Attention

递归神经网络的应用: 视觉注意力机制

A woman is throwing a frisbee in a park.

A dog is standing on a hardwood floor.

A stop sign is on a road with a mountain in the background.

A little girl sitting on a bed with a teddy bear.

A group of people sitting on a boat in the water.

A giraffe standing in a forest with trees in the background.

Show, Attend and Tell: Neural Image Caption Generation with Visual Attention

THANKS.