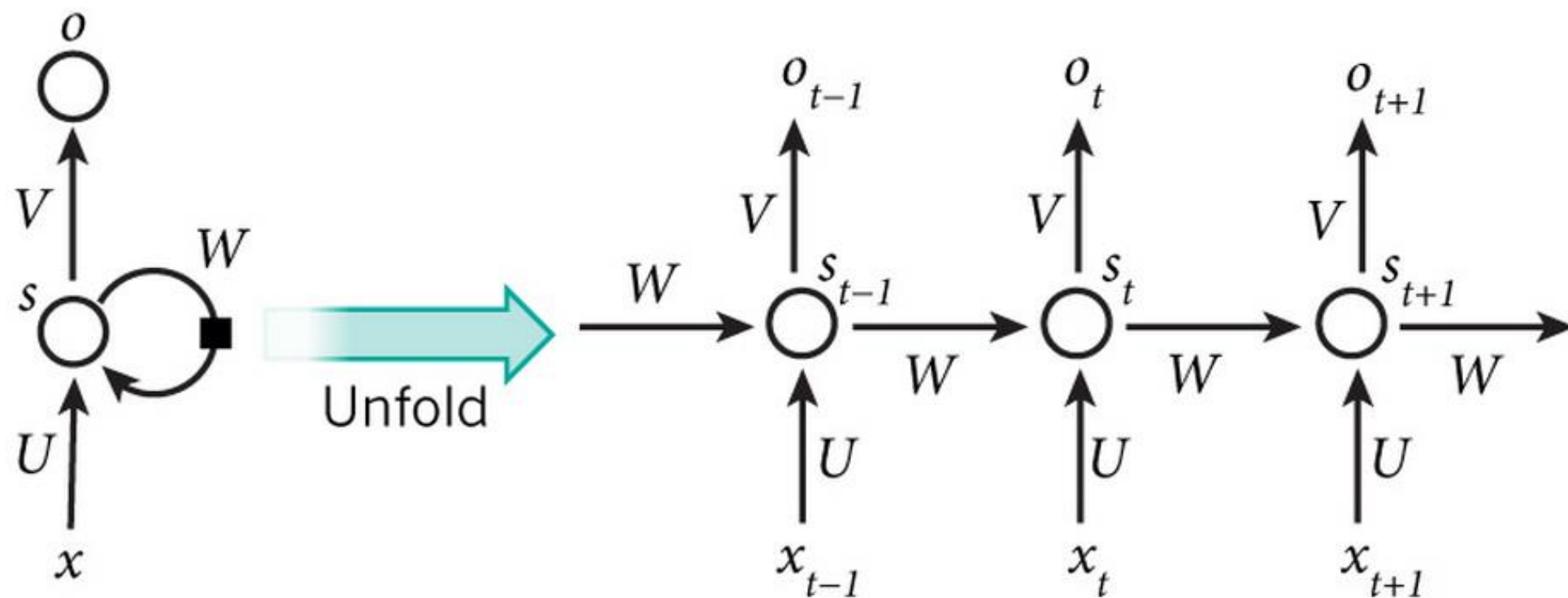


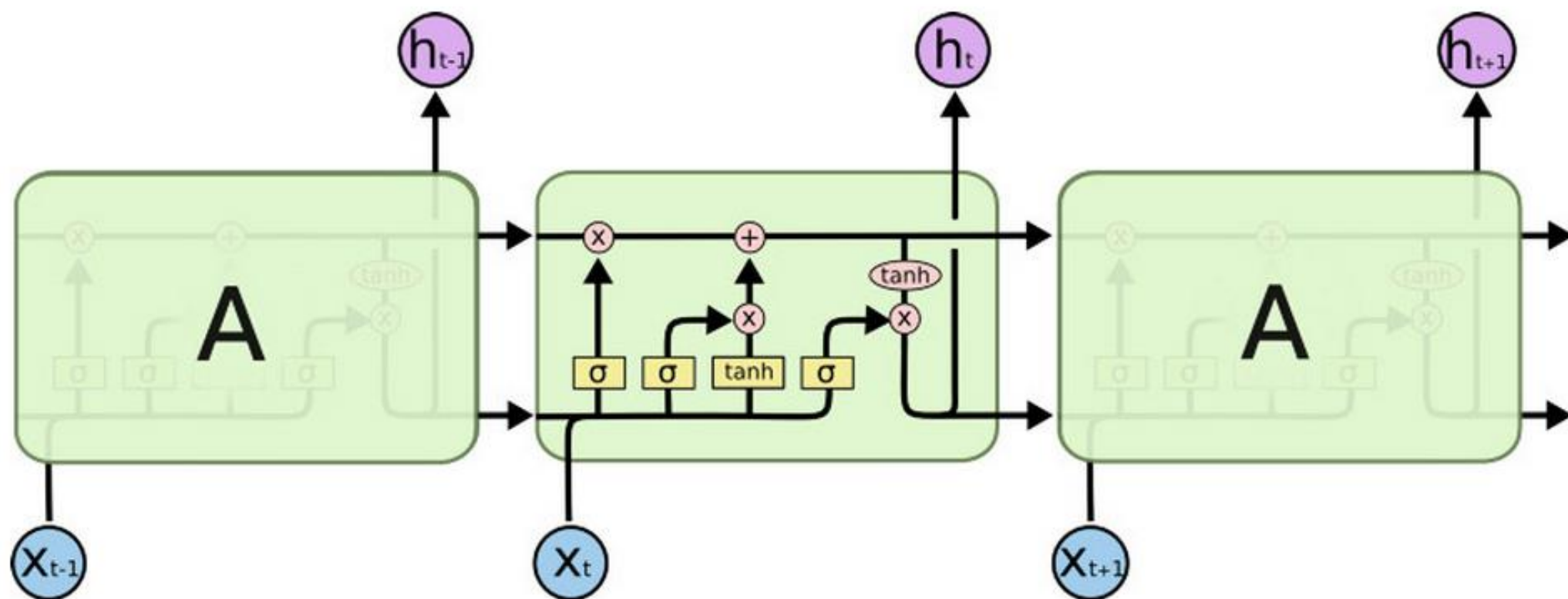
Seq2Seq

✓ RNN网络架构



Seq2Seq

✓ LSTM网络架构



Seq2Seq

✓ 机器翻译的历史

✎ 最早期的逐字翻译

Quiero ir a la playa más bonita.

I want to go to the beach more pretty.

Seq2Seq

✓ 机器翻译的历史

✎ 统计学的机器翻译

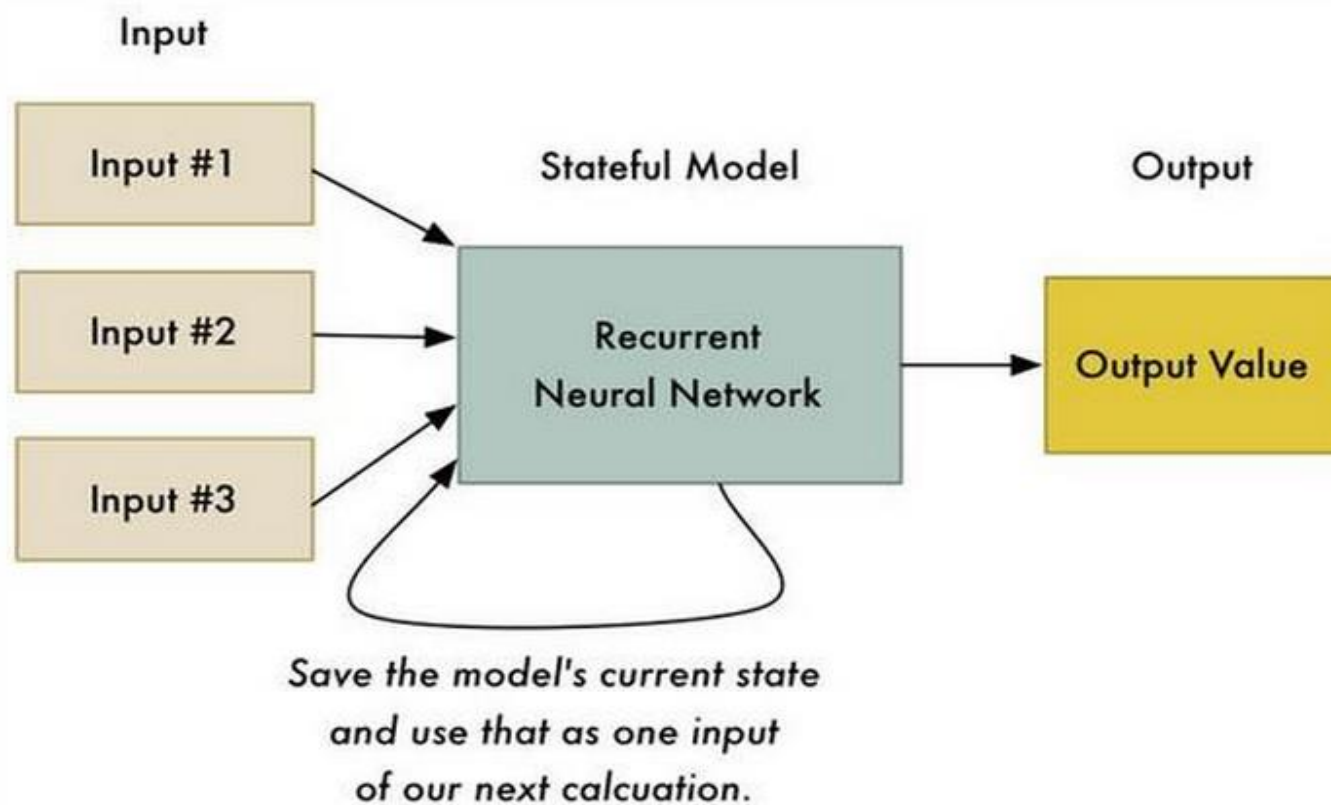
Quiero ir a la playa más bonita.



Seq2Seq

✓ 机器翻译的历史

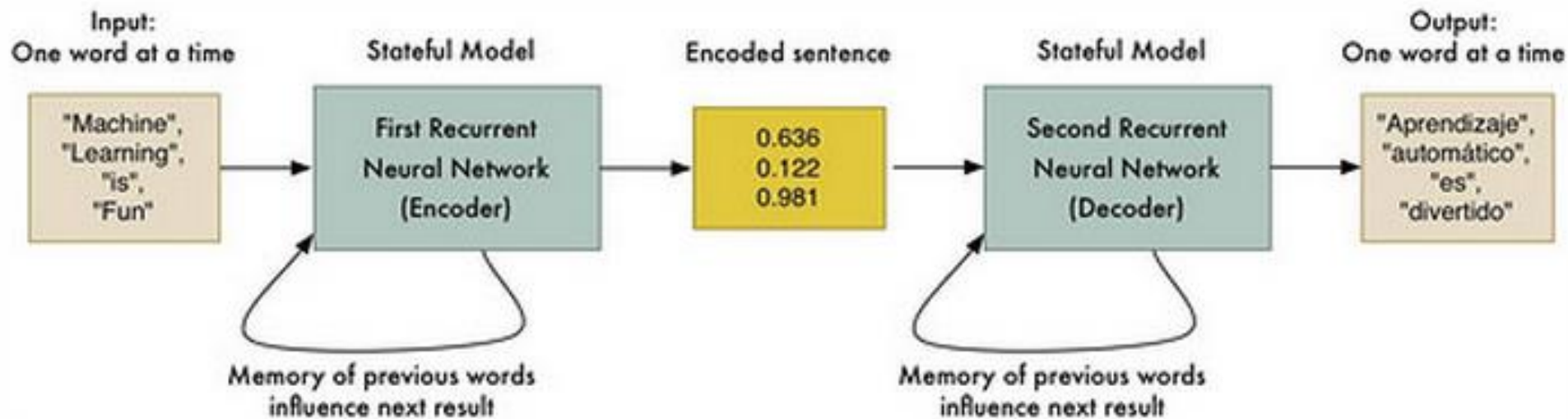
📎 循环网络和编码



Seq2Seq

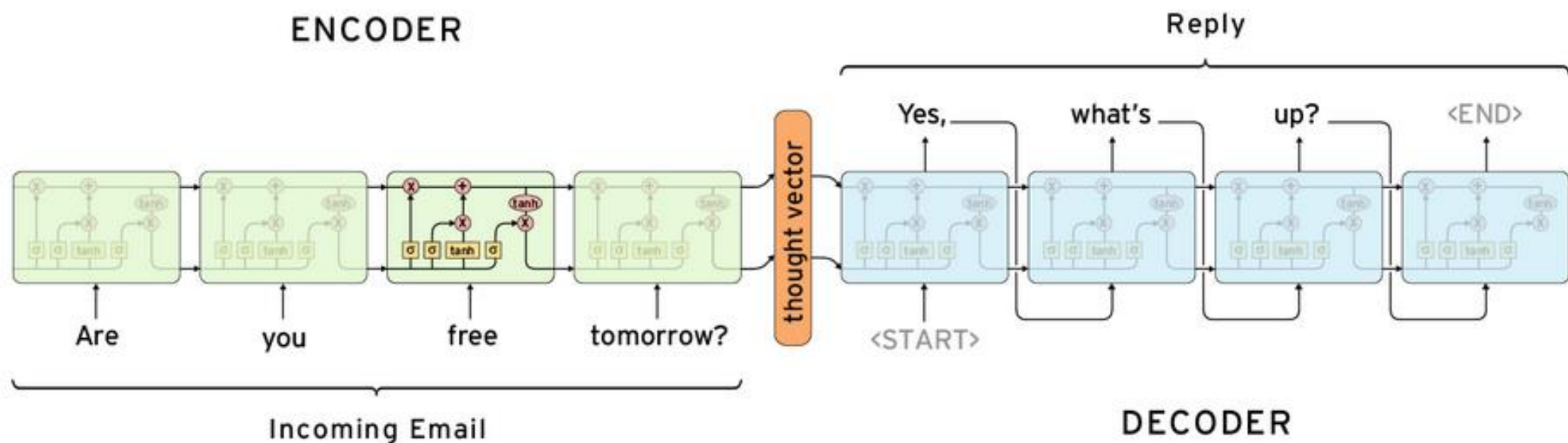
✓ 机器翻译的历史

✎ 解码与翻译



Seq2Seq

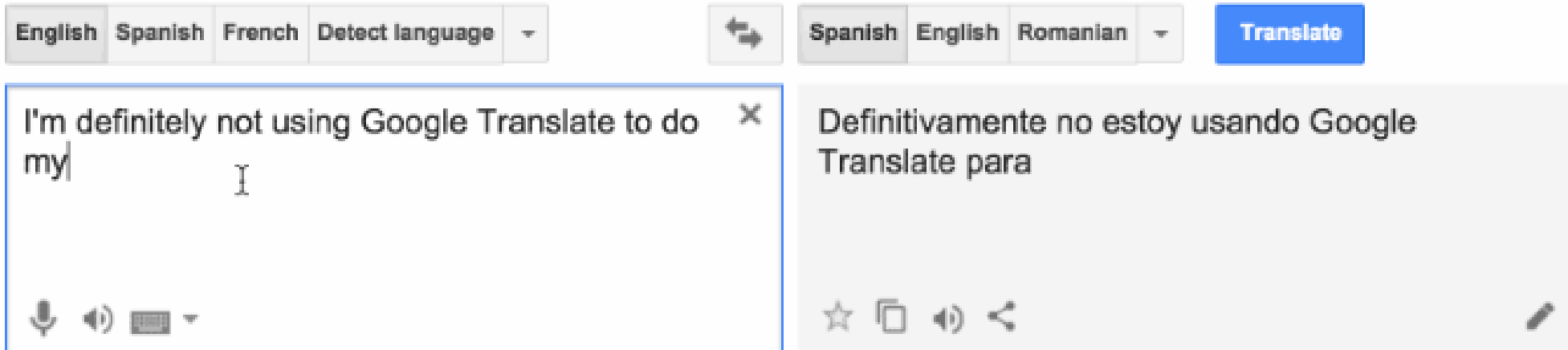
✓ Seq2Seq网络架构 (sequence-to-sequence)



Seq2Seq

✓ Seq2Seq应用

 机器翻译



The screenshot displays the Google Translate web interface. At the top, there are language selection buttons: English, Spanish, French, and Detect language. A swap button (two arrows) is located between the source and target language sections. The target language section includes buttons for Spanish, English, and Romanian, followed by a blue Translate button. The source text input field contains the text "I'm definitely not using Google Translate to do my" with a cursor at the end. The target text output field shows the partial translation "Definitivamente no estoy usando Google Translate para". At the bottom of the source input field, there are icons for voice input, speaker output, and a keyboard icon. At the bottom of the target output field, there are icons for a star, a copy icon, a speaker output icon, a share icon, and a pencil icon for editing.

English Spanish French Detect language

Spanish English Romanian Translate

I'm definitely not using Google Translate to do my

Definitivamente no estoy usando Google Translate para

Seq2Seq

✓ Seq2Seq应用

📎 文本摘要

Good quality summary output

S: a man charged with the murder last year of a british backpacker confessed to the slaying on the night he was charged with her killing , according to police evidence presented at a court hearing tuesday . ian douglas previte , ## , is charged with murdering caroline stuttle , ## , of yorkshire , england

T: man charged with british backpacker 's death confessed to crime police officer claims

O: man charged with murdering british backpacker confessed to murder

S: following are the leading scorers in the english premier league after saturday 's matches : ## - alan shearer -lrb- newcastle united -rrb- , james beattie .

T: leading scorers in english premier league

O: english premier league leading scorers

S: volume of transactions at the nigerian stock exchange has continued its decline since last week , a nse official said thursday . the latest statistics showed that a total of ##.### million shares valued at ###.### million naira -lrb- about #.### million us dollars -rrb- were traded on wednesday in #,### deals .

T: transactions dip at nigerian stock exchange

O: transactions at nigerian stock exchange down

Seq2Seq

✓ Seq2Seq应用

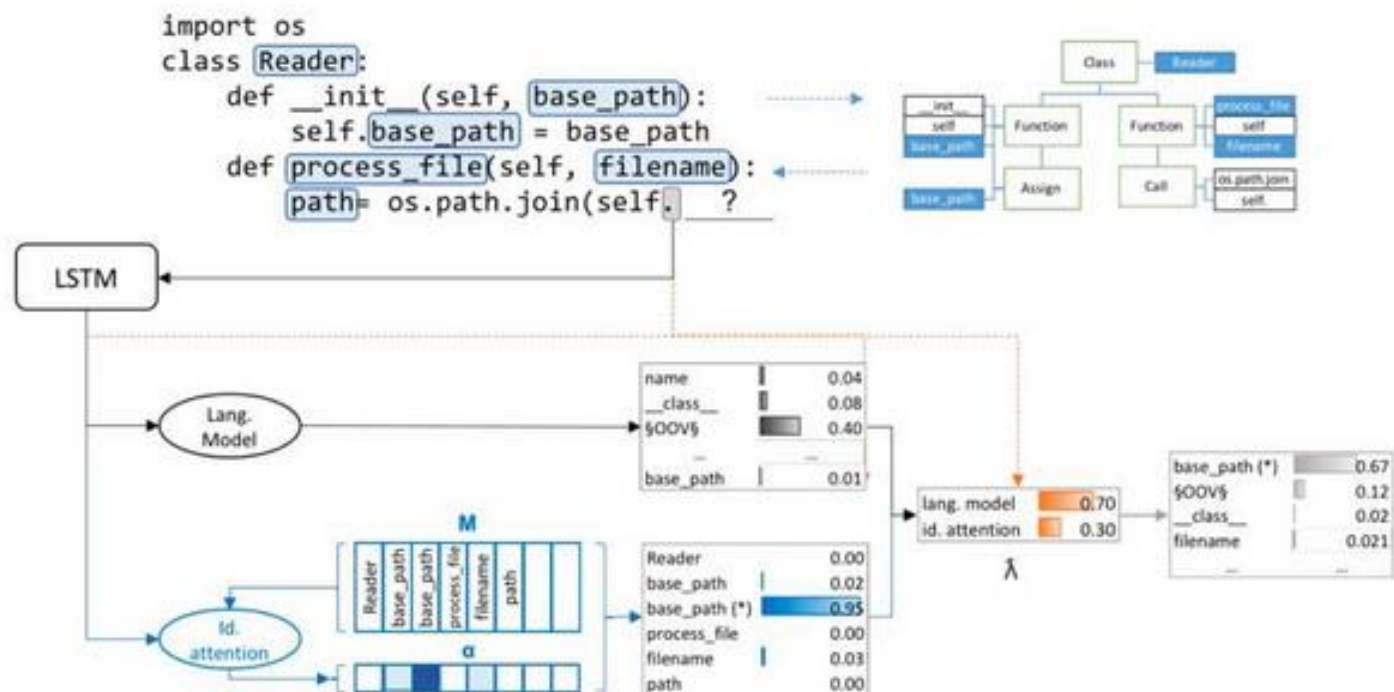
✎ 情感对话生成

Post	Model		Response(Original)	Response(Translated)
比情人节更庸俗的事就是， 对情人节的接待规格待遇提出 要求。 What is more vulgar than Valentine's day is to make specific demands on the reception of the Valentine's day.	Seq2Seq		这才是真正的情人节。	This is a real Valentine's day.
	ECM	Like	情人节快乐！	Happy Valentine's Day!
		Happiness	哈哈，这也太浪漫了吧！	Aha, this is too romantic!
		Sadness	我也想要这样的情人节。	I also want this kind of Valentine's day, sigh.
		Disgust	这就是所谓的情人节！	This is the so-called Valentine's day!
		Anger	这是赤裸裸的炫耀啊！	This is shameless show-off!
知道真相的我眼泪笑下来。 Knowing the truth, I laughed myself to tears.	Seq2Seq		知道真相的我眼泪掉下来。	After knowing the truth, I burst into tears.
	ECM	Like	太可爱了，太可爱了！	Too lovely, it's too lovely.
		Happiness	笑得我眼泪都出来了。	I can't help laugh myself to tears.
		Sadness	知道真相的我眼泪掉下来。	After knowing the truth, I burst into tears.
		Disgust	这是真的还是假的？	Is this true?
		Anger	什么意思？没看懂。	What do you mean? I don't understand.

Seq2Seq

✓ Seq2Seq应用

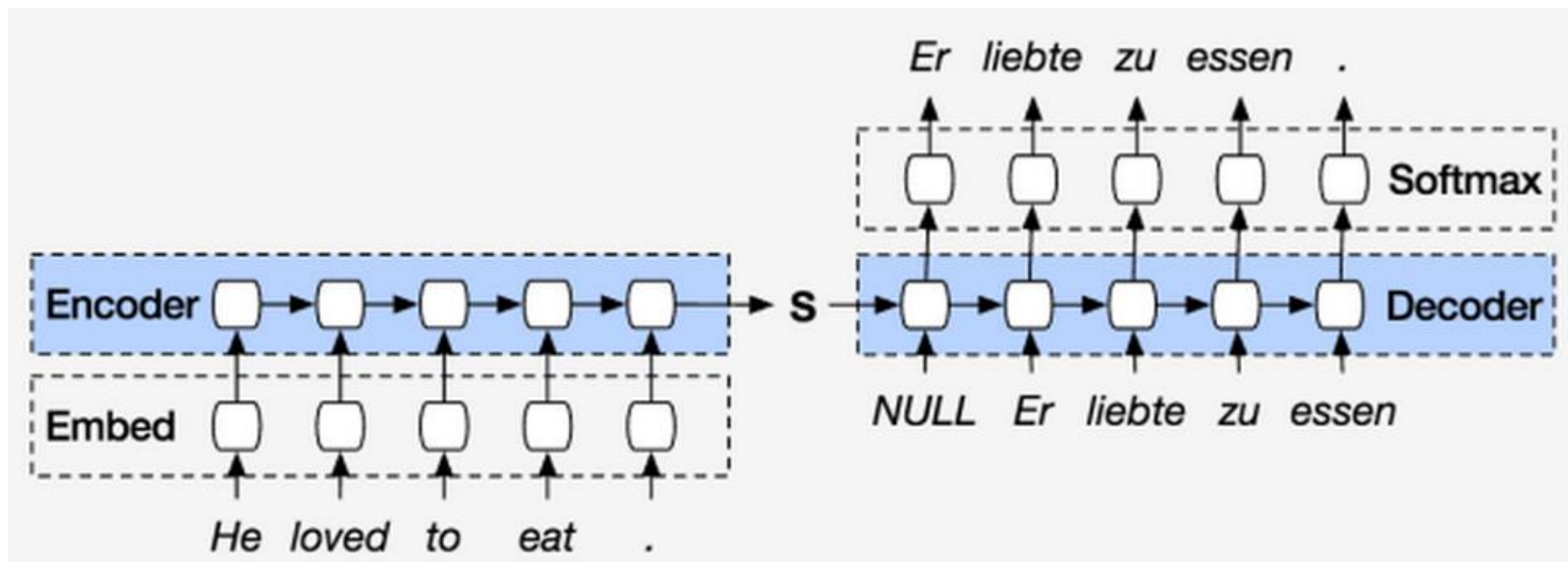
📎 代码补全



Seq2Seq

✓ Seq2Seq存在的问题

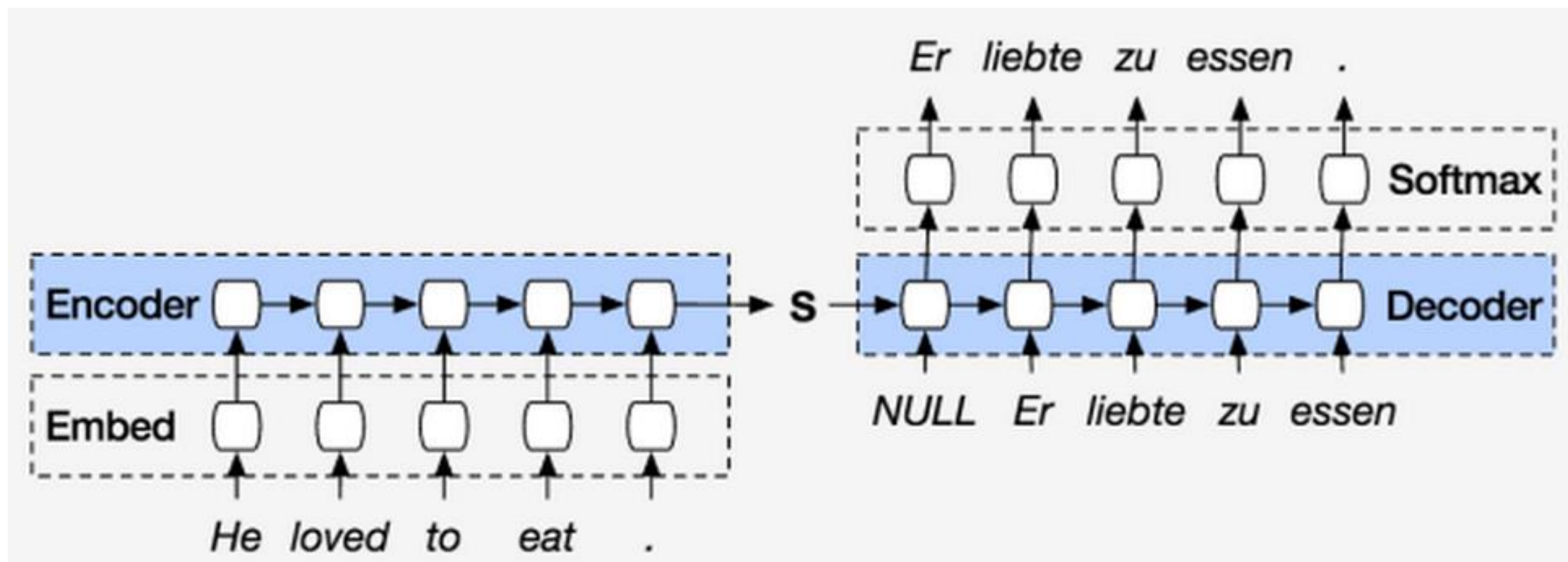
✎ 压缩损失了信息



Seq2Seq

✓ Seq2Seq存在的问题

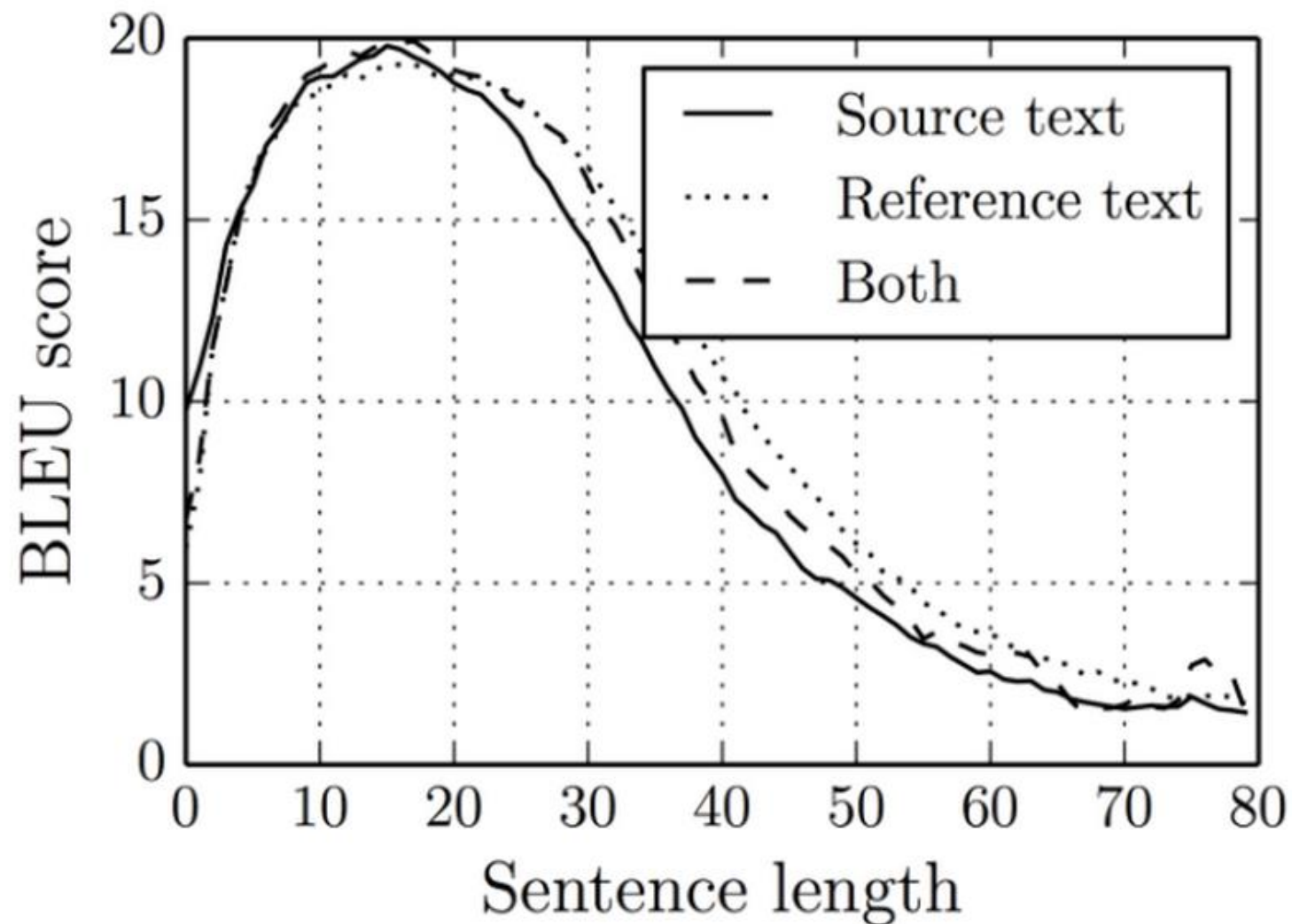
✎ 压缩损失了信息



Seq2Seq

✓ Seq2Seq存在的问题

✎ 长度限制



Seq2Seq

✓ Attention机制

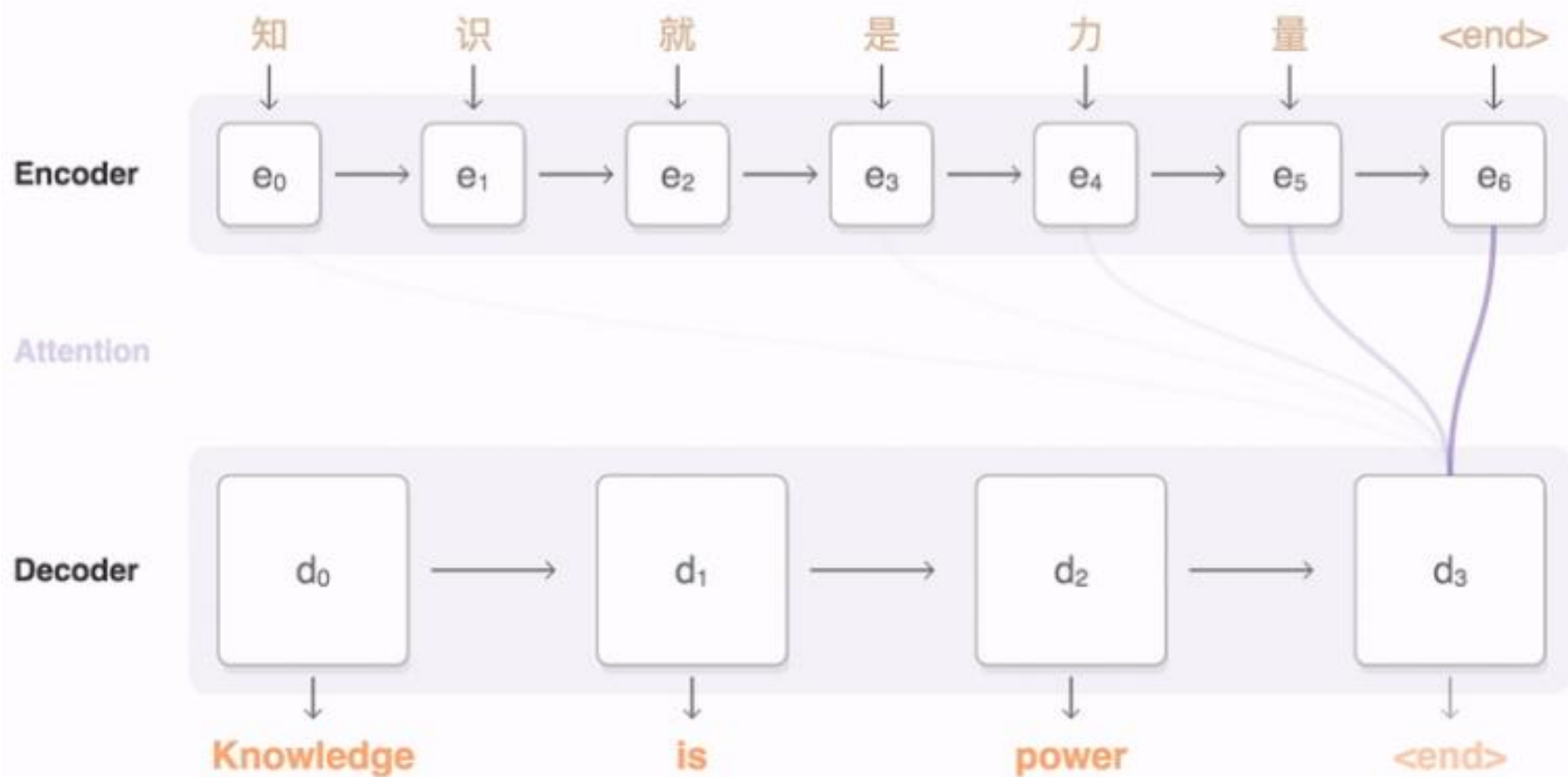
✎ “高分辨率” 聚焦在图片的某个特定区域并以 “低分辨率” 感知图像的周边区域的模式

✎ 通过大量实验证明，将attention机制应用在机器翻译，摘要生成，阅读理解等问题上，取得的成效显著

Seq2Seq

✓ Attention机制

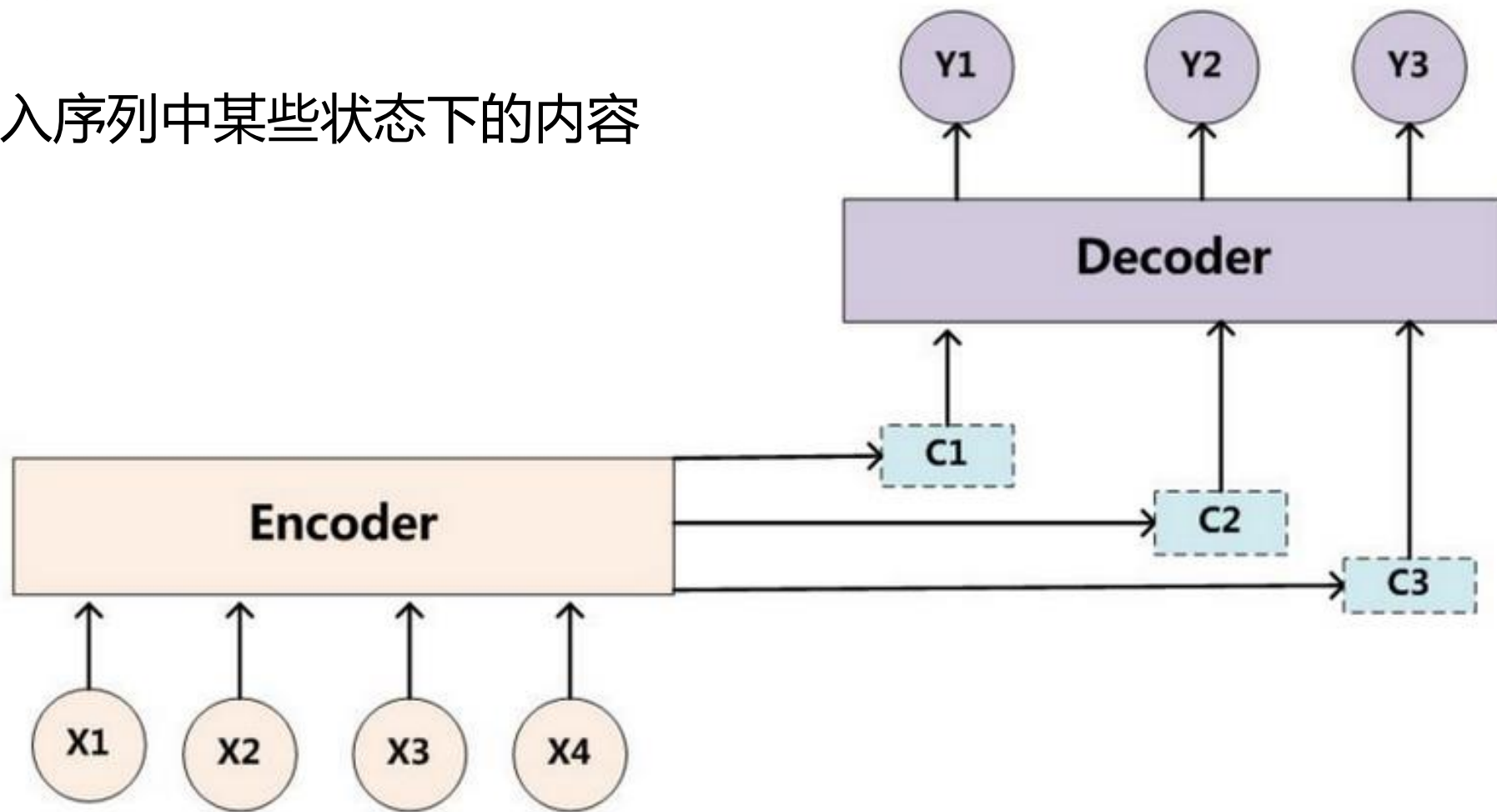
📎 关注输入序列中某些状态下的内容



Seq2Seq

✓ Attention机制

📎 关注输入序列中某些状态下的内容



Seq2Seq

✓ 机器翻译 : Cats eat mice $y_1=f(C_1), y_2=f(C_2, y_1), y_3=f(C_3, y_1, y_2)$

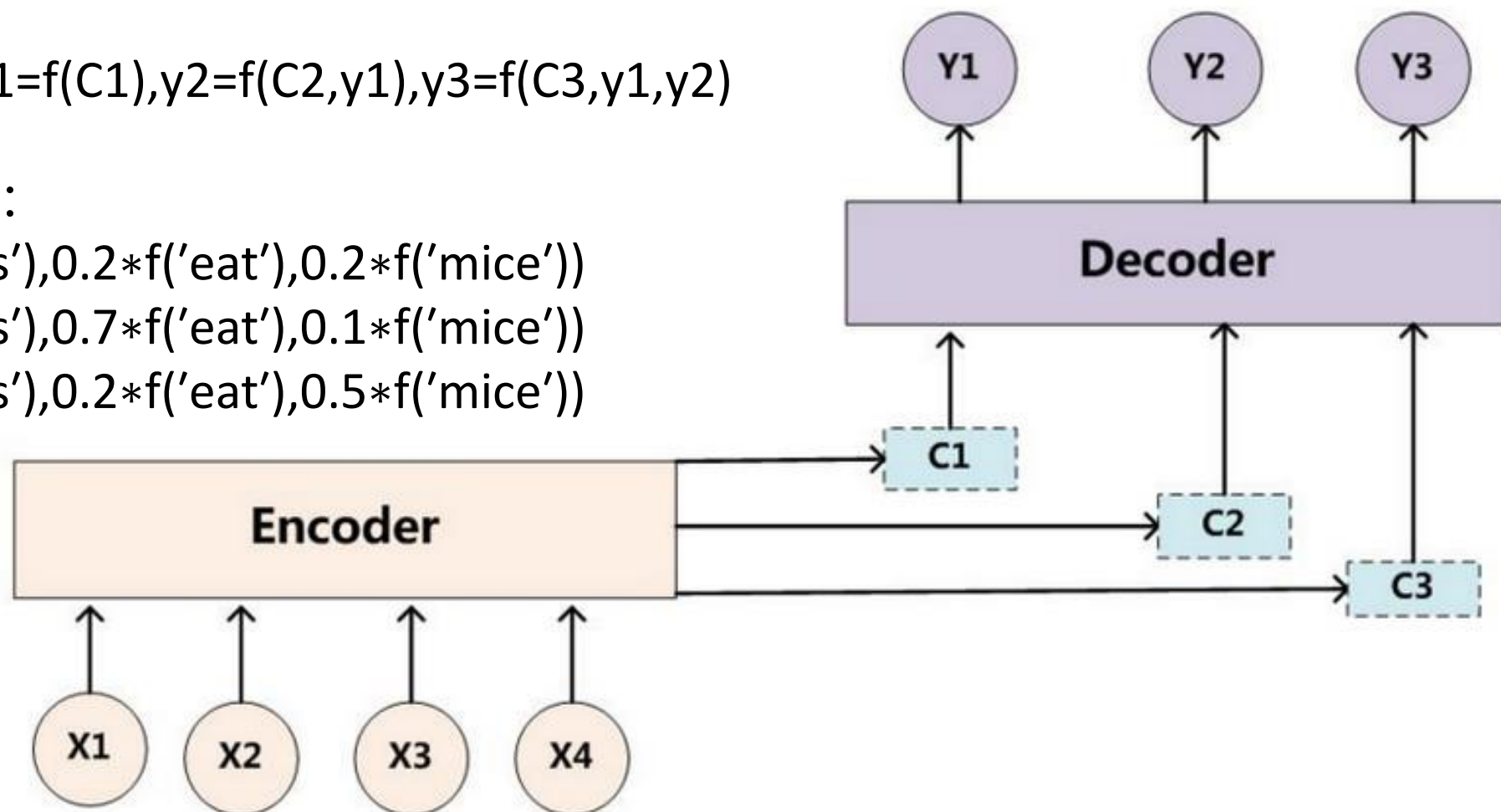
✎ 无Attention: $y_1=f(C_1), y_2=f(C_2, y_1), y_3=f(C_3, y_1, y_2)$

加入Attention:

$C_1=g(0.6*f('Cats'), 0.2*f('eat'), 0.2*f('mice'))$

$C_2=g(0.2*f('Cats'), 0.7*f('eat'), 0.1*f('mice'))$

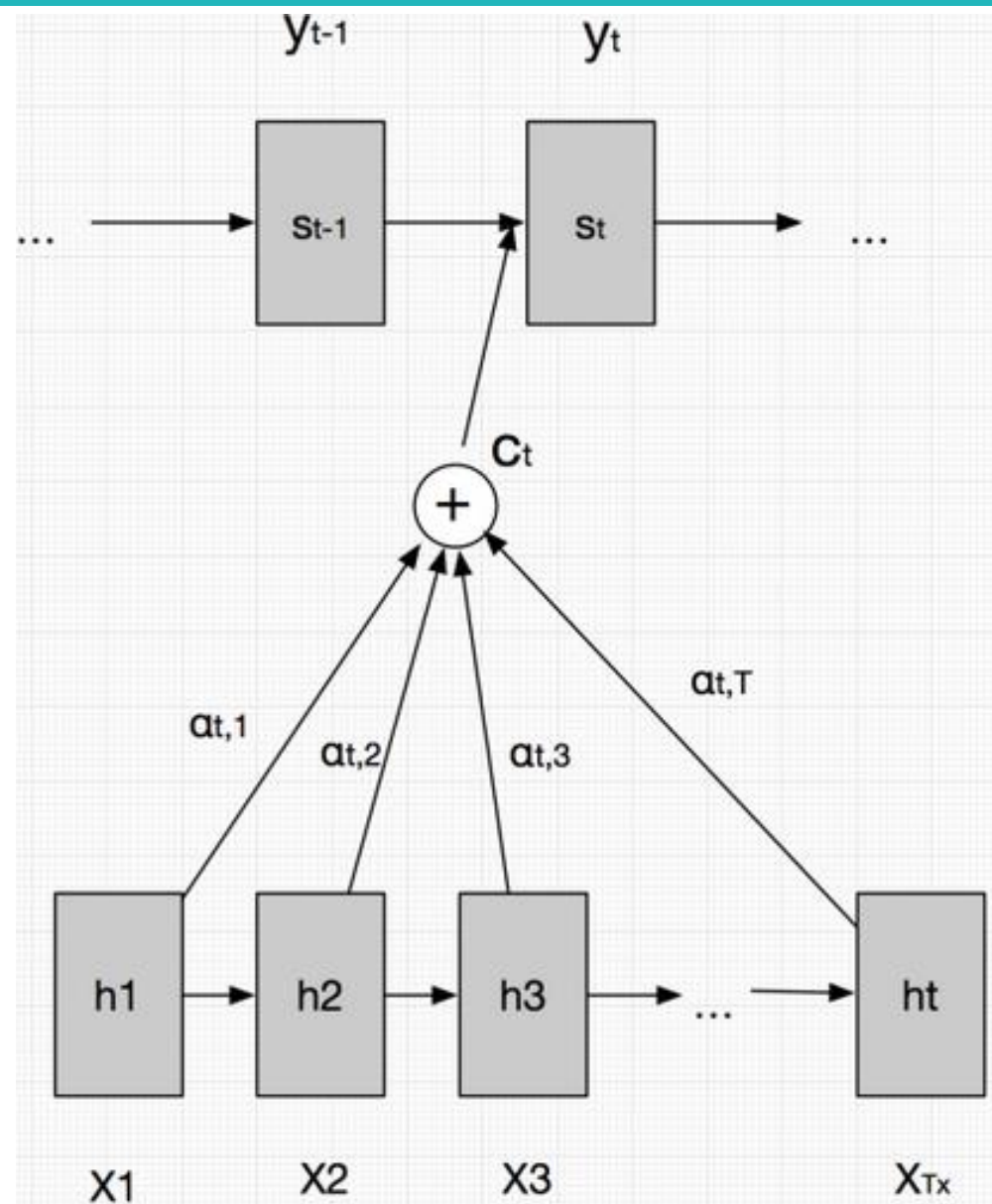
$C_3=g(0.3*f('Cats'), 0.2*f('eat'), 0.5*f('mice'))$



Seq2Seq

✓ Attention机制

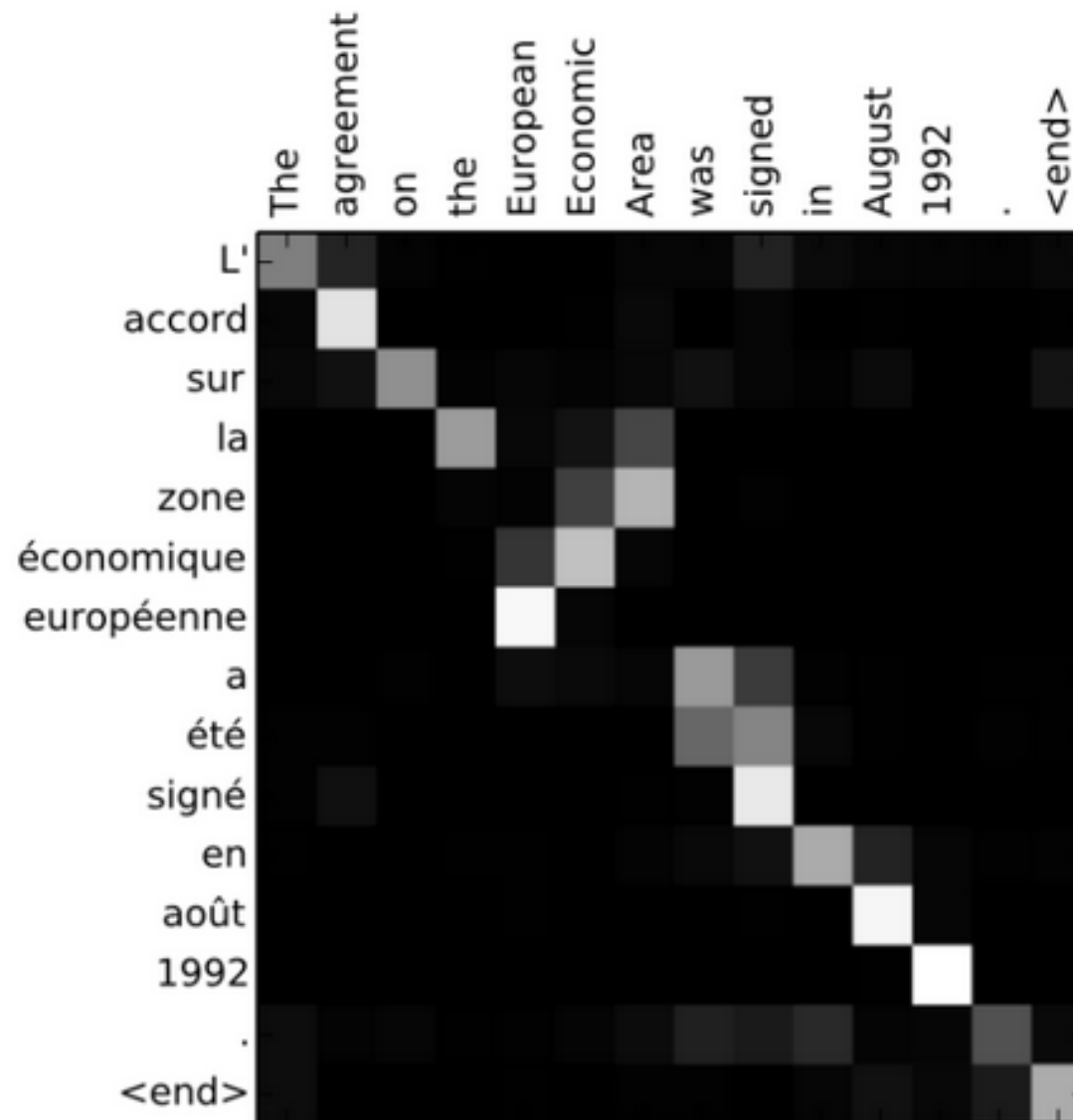
✎ 对Encoder层状态的加权
从而掌握输入语句中的所有细节信息



Seq2Seq

✓ Attention机制

加权效果



Seq2Seq

✓ Bucket机制

✎ 正常情况要对所有句子进行补全

✎ Bucket可以先分组，再计算