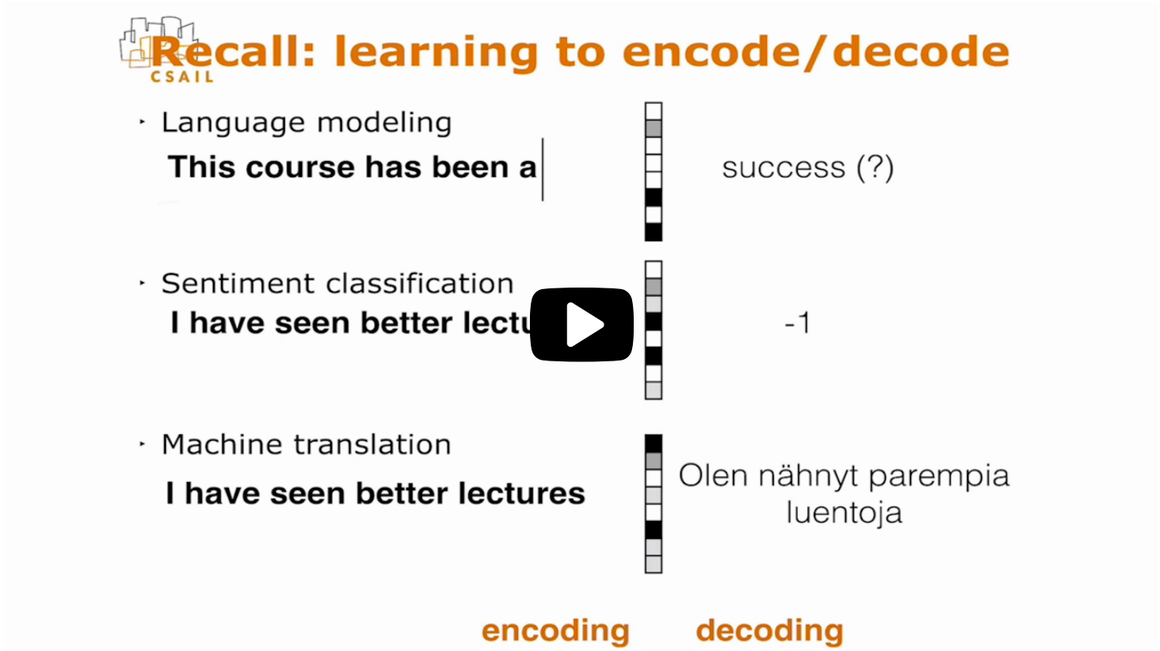
1. Markov Models
Markov Models



0:00 / 0:00 Speed 1.50x

Start of transcript. Skip to the end.

Welcome back.

Today we're going to be talking about how

to generate sequences using recurrent neural networks.

So if you recall what we did last time,

we showed how recurrent neural networks can

be used to condense a map sequences into vector

representations, and those vector representations

can then be used for all kinds of predictions,

Video
Download video file

Transcripts
Download SubRip (.srt) file
Download Text (.txt) file

Markov Symbols

1/1 point (graded)

To specify a Markov language model, what additional symbols do we need to add to our set of possible symbols?

- [x] a start symbol ✔
- [x] an end symbol ✔
- [x] a symbol for unknown words ✔
- [ ] a symbol for complicated words

✔

Solution:

As shown in the lecture video, we need start and end symbols in order to specify the bounds of our sentence. We also need a symbol for unknown words as there might be words in the sentence not represented in our Markov Model. Lastly, our Markov model treats words the same regardless of complexity. We're simply representing a table of transition probabilities, so there's no need to create extra symbols for complex words.

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Transition Probabilities

2/2 points (graded)

w_{i-1} \ w_i	ML	course	is	UNK	<end>
<beg>	0.7	0.1	0.1	0.1	0.0
ML	0.1	0.5	0.2	0.1	0.1
course	0.0	0.0	0.7	0.1	0.2
is	0.1	0.3	0.0	0.6	0.0
UNK	0.1	0.2	0.2	0.3	0.2

Using a first order Markov model specified above, what is the probability of generating the following sentence <beg> ML course UNK <end>?

- (•) 0.007 ✔
- ( ) 0.01
- ( ) 0.003
- ( ) 0.005

Which the following sentences are possible to generate? Choose all those apply.

- [ ] <beg> course ML is UNK <end>
- [ ] <beg> <end>
- [ ] course is ML <end>
- [x] <beg> ML course <end> ✔

✔

Solution:

For the first question,

$$P(ML|<beg>) \times P(course|ML) \times P(UNK|course) \times P(<end>|UNK) = 0.7 \times 0.5 \times 0.1 \times 0.2 = 0.007$$

. For the second question, all valid sentences must start with <beg>. The probability of the second word being <end> is zero. In addition, the probability of ML occuring after course is also zero. The correct answer is the only choice with nonzero transition probabilities at each step.

Submit You have used 2 of 2 attempts

Answers are displayed within the problem

Maximum Likelihood

1/1 point (graded)
Suppose our training examples are the following three sentences.

ML courses are cool.

Humanities courses are cool.

But some courses are boring.

Using a bigram model, what is the maximum likelihood estimate for the probability that the next word is 'cool', given that the previous word is 'are'?

- $\frac{2}{3}$ ✔
- 1
- $\frac{1}{3}$
- $\frac{1}{4}$

Solution:

"are" occurs three times in the training corpus, and is followed by "cool" two out of those three times.

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Discussion

Hide Discussion

Topic: Unit 3 Neural networks (2.5 weeks):Lecture 11. Recurrent Neural Networks 2 / 1. Markov Models

Add a Post

All Posts

Is the grader for Transition Probabilities 2nd part correct?

question posted about 11 hours ago by **sandipan_dey**

Is the grader for Transition Probabilities 2nd part (Which the following sentences are possible to generate) correct? Can you please double check?

This post is visible to everyone.

Sarcus

about 10 hours ago - marked as answer about 9 hours ago by **Erocha** (Community TA)

Not staff, but it was correct for me. Double-check the sentences that are impossible regarding probability or that lack important and needed symbols :)

Ok i got it now, we need to see whether the structure of a sentence is valid or not ,along with its probability.

posted less than a minute ago by **sandipan_dey**

Add a comment

Add a Response

Add a response:

Preview

Submit

Learn About Verified Certificates