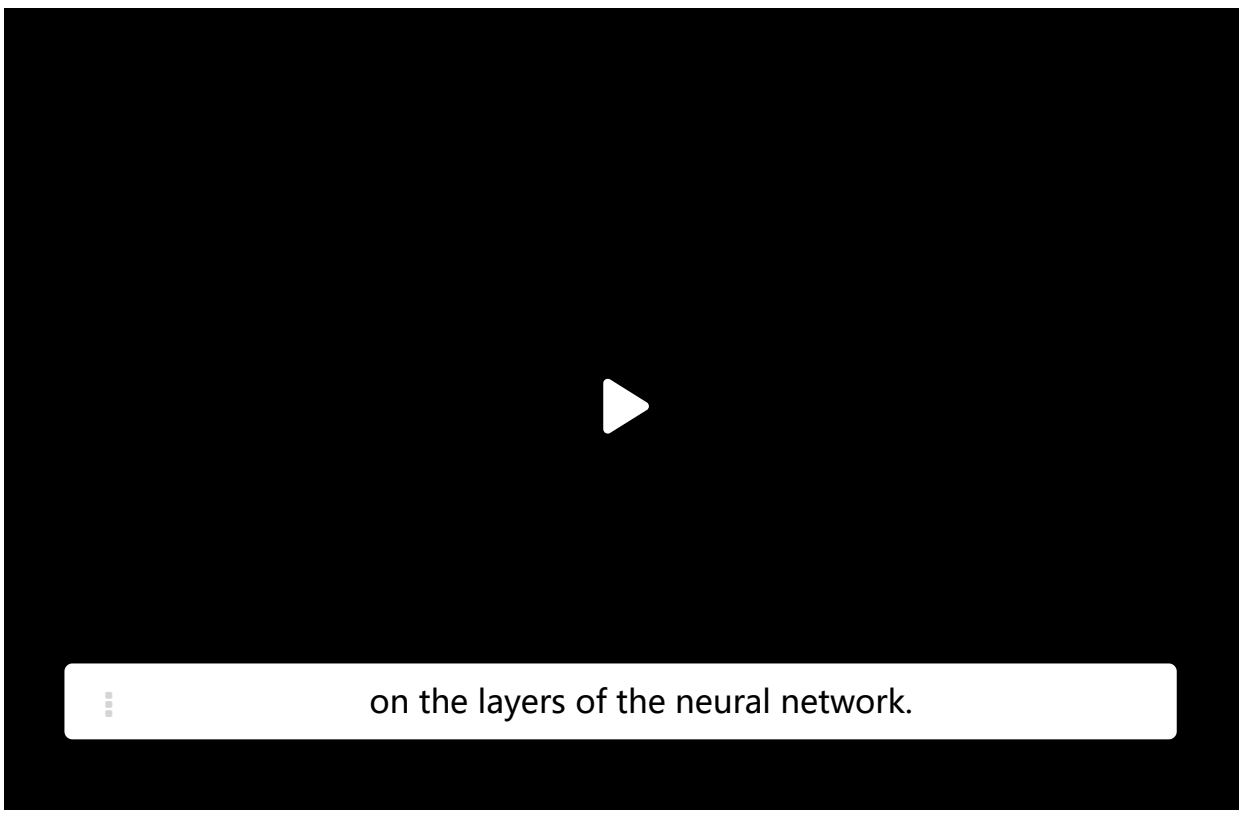
4. Encoding with RNN
Encoding with RNN



9:00 / 9:00 1.0x

The third difference is that since we

are applying the same box as a way of turning

the previous summary and the new information

into an updated summary, we are applying the same parameters

at each of these layers.

So we are not adding parameters that depend, essentially,

on the layers of the neural network.

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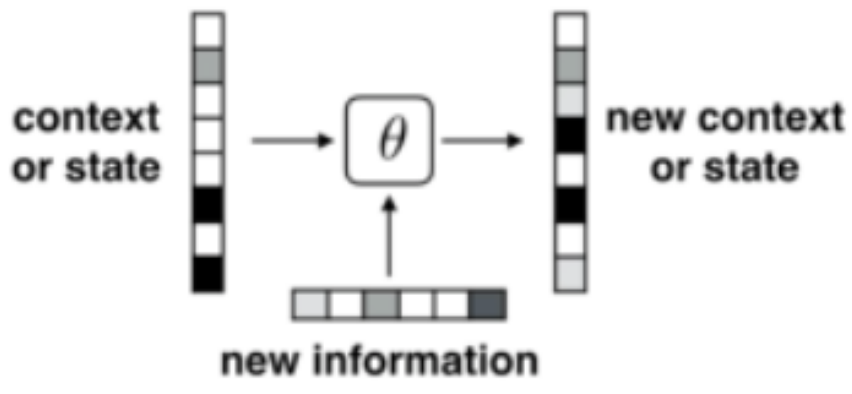
Which is Which

6/6 points (graded)

As discussed in the lecture, the following is a typical structure of a single-layered recurrent neural network.



The structure above is often expressed like the following in terms of equations:

$$s_t = \tanh\left(W^{s,s}s_{t-1} + W^{s,x}x_t\right)$$

Now, which element of the picture corresponds to s_t in the equation above?

- context or state
- new information
- new context or state ✔

Which element of the picture corresponds to x_t in the equation above?

- context or state
- new information ✔
- new context or state

Which element of the picture corresponds to s_{t-1} in the equation above?

- context or state ✔
- new information
- new context or state

Which of the following are "parameters" of the recurrent neural network?
(Choose all those apply.)

- s_{t-1}
- $W^{s,s}$ ✔
- $W^{s,x}$ ✔
- s_t
- x_t

✔

What is the role represented by $W^{s,x}$?

- taking into account new information ✔
- deciding what part of the previous information to keep

What is the role represented by $W^{s,s}$?

taking into account new information

deciding what part of the previous information to keep ✔

Solution:

RNN is differentiated from feed-forward neural networks in that it receives a new input x_t together with previous state s_{t-1}. s_{t-1}, s_t are states, x_t is a new input.The parameters are $W^{s,s}$, which is multiplied by the previous state vector, and $W^{s,x}$, which is multiplied by the new information.

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Hidden State

1/1 point (graded)
For s as defined in the lecture, where s_0 is the null vector, take the sentence “Efforts and courage are not in vain". Which of the following contain(s) information about the phrase “Efforts and courage"? (Choose all those apply.)

- [x] s_3 ✔
- [x] s_4 ✔
- [x] s_5 ✔
- [ ] s_2

✔

Solution:

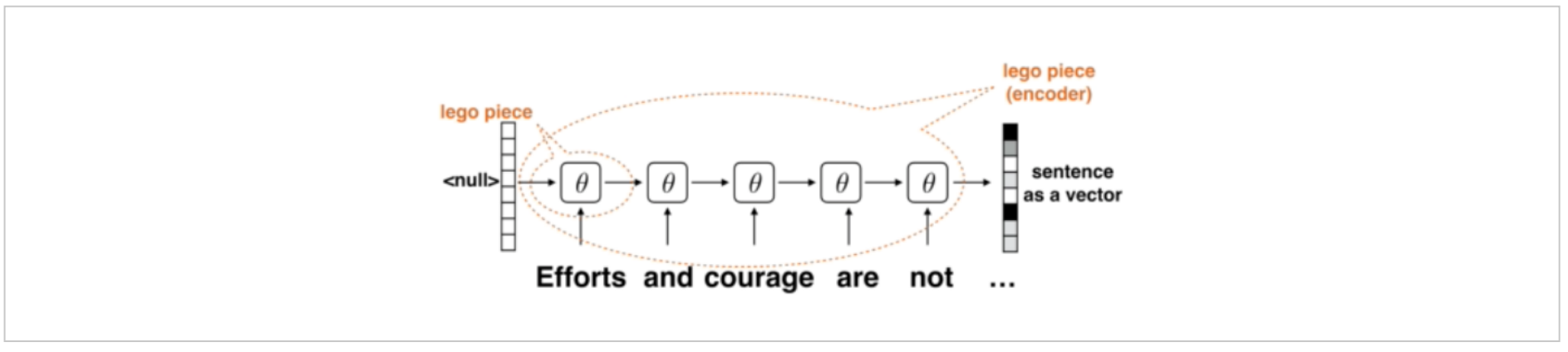
We will expect the states at time steps 3 and onward to contain information about the first three words.

Submit You have used 1 of 2 attempts

Answers are displayed within the problem

Encoding Sentences

0/1 point (graded)
Following is a graphical representation of encoding sentences with RNN.



Which of the following is true about encoding sentences with RNNs?
(Choose all those apply.)

- [ ] input is received at each layer (per word), not just at the beginning as in a typical feed-forward network ✔
- [x] the number of layers varies and depends on the length of the sentence ✔
- [ ] parameters of each layer is different
- [x] parameters of each layer are shared ✔

✖

Solution:

Differences between feed-forward and recurrent neural networks were discussed in the lecture. In RNN's, input is received at each layer, unlike typical feed-forward networks. Also, usually each word of the sentence is received as an input at each layer of the RNN. Parameters, which refer to $W^{s,s}$,$W^{s,x}$ of the previous problem, are shared across layers.

Submit You have used 1 of 1 attempt

Answers are displayed within the problem

Discussion

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Topic: Unit 3 Neural networks (2.5 weeks):Lecture 10. Recurrent Neural Networks 1 / 4. Encoding with RNN

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