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Summary/Review

Recurrent Neural Networks (RNNs)

Recurrent Neural Networks are a class of neural networks that allow previous outputs to be used as inputs while having hidden states. They are mostly used in applications of natural language processing and speech recognition.

One of the main motivations for RNNs is to derive insights from text and do better than “bag of words” implementations. Ideally, each word is processed or understood in the appropriate context.

Words should be handled differently depending on “context”. Also, each word should update the context.

Under the notion of recurrence, words are input one by one. This way, we can handle variable lengths of text. This means that the response to a word depends on the words that preceded it.

These are the two main outputs of an RNN:

- Prediction: What would be the prediction if the sequence ended with that word.
- State: Summary of everything that happened in the past.

Mathematical Details

Mathematically, there are cores and subsequent dense layers

current state = function1(old state, current input).

current output = function2(current state).

We learn function1 and function2 by training our network!

r = dimension of input vector

s = dimension of hidden state

t = dimension of output vector (after dense layer)

U is a s × r matrix

W is a s × s matrix

Head's Up!

Over **66%** of learners reviewed this video more than once and found it helpful. Pay attention!

Was this helpful? Yes No