

Recurrent Neural Networks

RNNs

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RNNs

A Simple RNN

All previously covered ANNs have no memory. Each input is processed independently.

RNNs are different, as they have a „memory“ in form of an internal loop.

Sequences are processed by iterating through the elements and maintaining a state, which contains information of what the network has seen so far.

The state is then reset between independent sequences

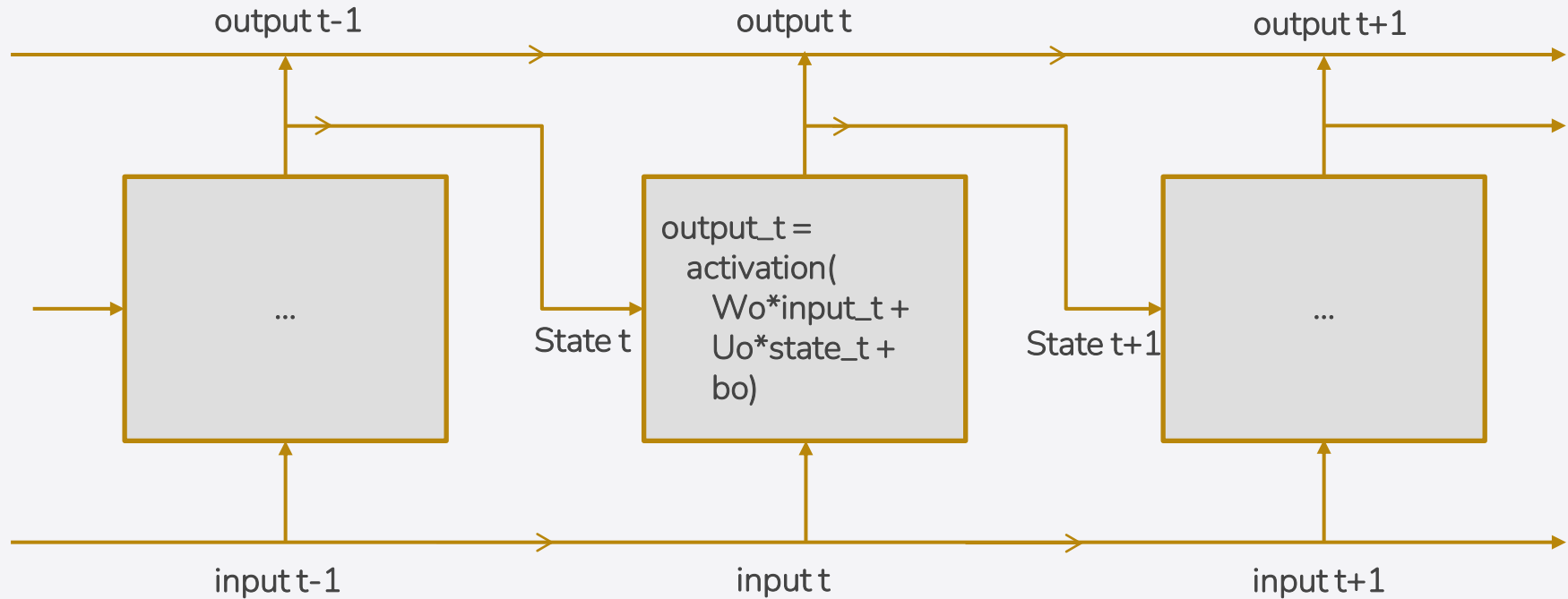
LSTM

The problem with simple RNNs is that they do not have a long term memory (vanishing gradients), meaning they cannot process long sequences.

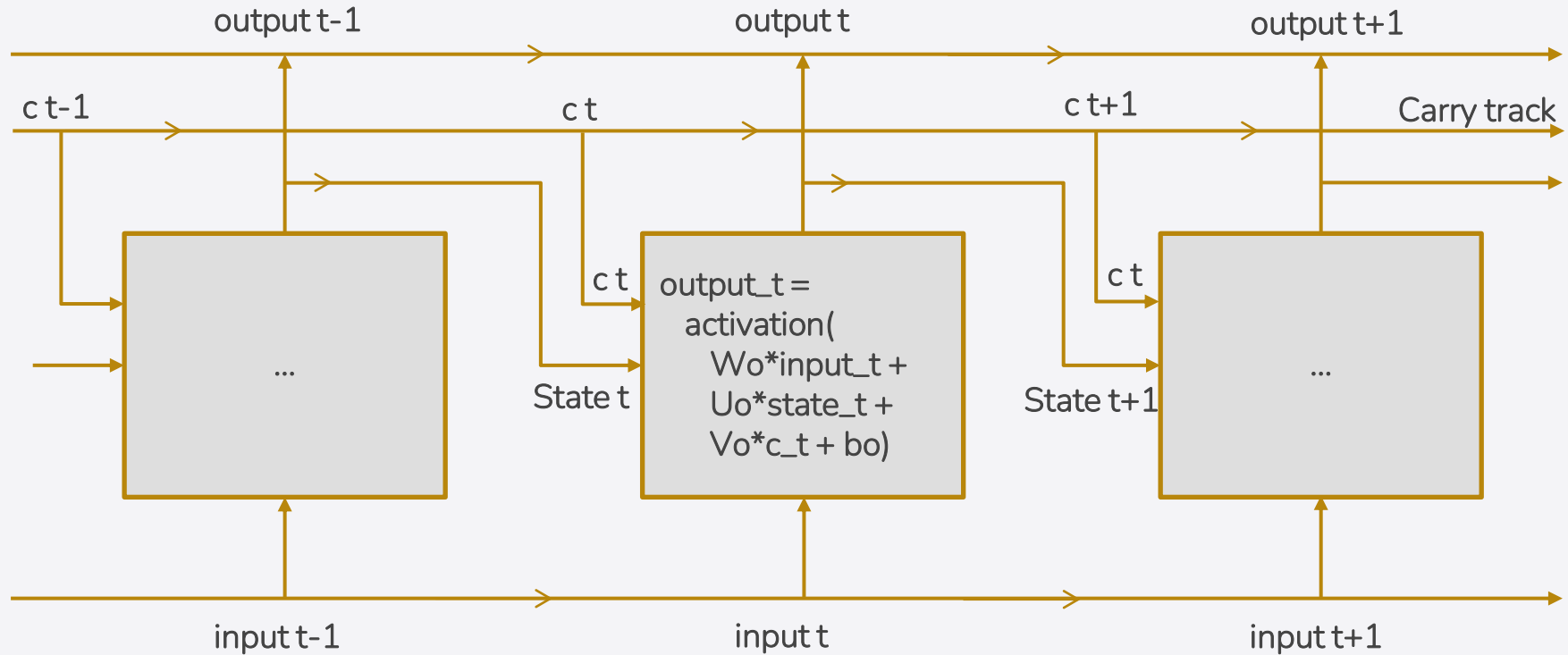
LSTMs solve that problem by adding a long term memory track – a way to carry information across many timesteps.

GRUs are a simplified, more cost efficient version of LSTMs

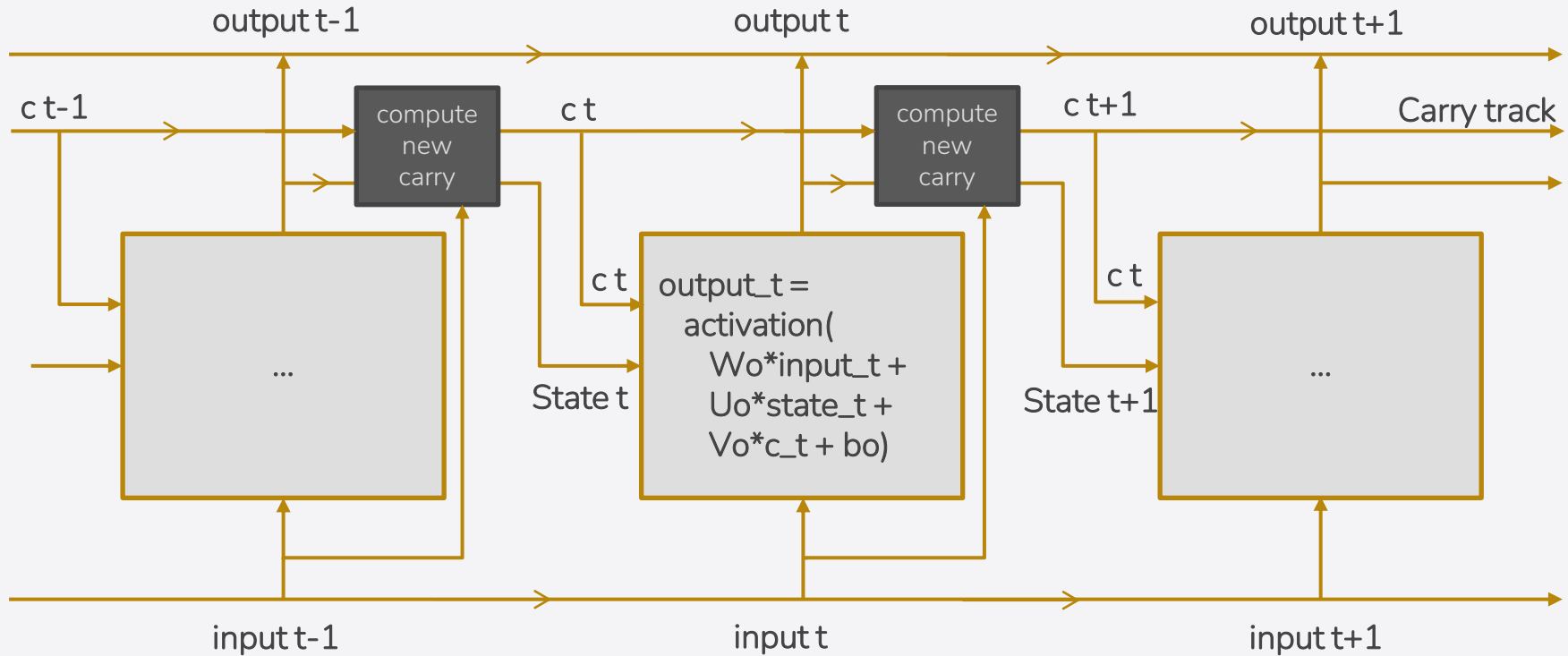
Simple RNN cell



Simple RNN -> LSTM



LSTM cell



THANK YOU



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