

Recurrent Neural Networks and Long Short-Term Memory (LSTM)

WHAT IS LONG SHORT-TERM MEMORY (LSTM)?

Long short-term memory (LSTM) networks are an extension of RNN that extend the memory. LSTMs are used as the building blocks for the layers of a RNN. LSTMs assign data “weights” which helps RNNs to either let new information in, forget information or give it importance enough to impact the output.

The units of an LSTM are used as building units for the layers of an RNN, often called an LSTM network.

LSTMs enable RNNs to remember inputs over a long period of time. This is because LSTMs contain information in a memory, much like the memory of a computer. The LSTM can read, write and delete information from its memory.

This memory can be seen as a gated cell, with gated meaning the cell decides whether or not to store or delete information (i.e., if it opens the gates or not), based on the importance it assigns to the information. The assigning of importance happens through weights, which are also learned by the algorithm. This simply means that it learns over time what information is important and what is not.

In a long short-term memory cell you have three gates: input, forget and output gate. These gates determine whether or not to let new input in (input gate), delete the information because it isn't important (forget gate), or let it impact the output at the current time step (output gate). Below is an illustration of an RNN with its three gates: