

Name: Suhaila Ahmed Hassan

Track: AI

Branch: Alexandria

RNN Summary

Problem It Solves

Traditional neural networks (ex: Feedforward NNs, CNNs) assume inputs are independent of one another. They cannot handle sequential data, where previous inputs influence the current state.

RNNs are designed to model sequential data where current inputs are influenced by previous ones. They solve problems where order of input matters and past context impacts future predictions.

How RNN Works

Step 1: RNN has an internal "memory", called the hidden state, which starts off as an empty vector. This memory will help the RNN retain and use information from previous steps in the sequence.

Step 2: RNN takes in a sequence of data, processing one element at a time in order.

Step 3: The RNN takes the first input, and combines it with the empty hidden state to produce a new and updated hidden state.

Step 4: For each of the following inputs, the RNN combines the current input with the updated hidden state from the previous step.

Step 5: RNN repeats this process for each item in the sequence, updating its hidden state at each step. By the end, the RNN has a final hidden state that keeps information about the entire sequence.

Additional Information

RNNs utilize a weight sharing methodology, where the same weights are used at each step across the entire sequence. This helps the model be more efficient when updating its hidden state.

Architecture

