Improving Memory in Recurrent Neural Networks

Background
Understanding language requires memorizing the right stuff and forgetting all the rest. How brain manages it? Nobody really knows....

Artificial Neural Networks are used to solve engineering tasks in the way that brain does. They have recently became a popular tool for a variety of Language related tasks. Recently many engineering systems based on Artificial Neural Networks were proposed ranging from introducing explicit memory cells to just initializing weights appropriately in a vanilla RNN framework.

Project Goals
We will train an artificial recurrent neural network to perform a memory requiring task, based on a recent work by Facebook Research [1]. We will then try to make the memory writing process less supervised. Namely, we will not tell the network what details of input data worth (memorizing), instead we will:

1. Offer a training set of a gradually increasing complexity. (curriculum learning [2])
2. Try a simpler network architecture, so that the internal dynamics of the network become more trackable.

Prerequisites
- Python programming skills
- Interest in Deep Learning, Natural Language Processing and some Biology.

Bibliography

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