

## Hierarchical Tree Long Short-Term Memory for Sentence Representations

**Authors :** Xiuying Wang, Changliang Li, Bo Xu

**Abstract :** A fixed-length feature vector is required for many machine learning algorithms in NLP field. Word embeddings have been very successful at learning lexical information. However, they cannot capture the compositional meaning of sentences, which prevents them from a deeper understanding of language. In this paper, we introduce a novel hierarchical tree long short-term memory (HTLSTM) model that learns vector representations for sentences of arbitrary syntactic type and length. We propose to split one sentence into three hierarchies: short phrase, long phrase and full sentence level. The HTLSTM model gives our algorithm the potential to fully consider the hierarchical information and long-term dependencies of language. We design the experiments on both English and Chinese corpus to evaluate our model on sentiment analysis task. And the results show that our model outperforms several existing state of the art approaches significantly.

**Keywords :** deep learning, hierarchical tree long short-term memory, sentence representation, sentiment analysis

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