Recurrent Neural Networks with Deep Hierarchical Mixed Structures for Chinese Document Classification

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Abstract : In natural languages, there are always complex semantic hierarchies. Obtaining the feature representation based on these complex semantic hierarchies becomes the key to the success of the model. Several RNN models have recently been proposed to use latent indicators to obtain the hierarchical structure of documents. However, the model that only uses a single-layer latent indicator cannot achieve the true hierarchical structure of the language, especially a complex language like Chinese. In this paper, we propose a deep layered model that stacks arbitrarily many RNN layers equipped with latent indicators. After using EM and training it hierarchically, our model solves the computational problem of stacking RNN layers and makes it possible to stack arbitrarily many RNN layers. Our deep hierarchical model not only achieves comparable results to large pre-trained models on the Chinese short text classification problem but also achieves state of art results on the Chinese long text classification problem.