

Sequence labeling is a type of machine learning problem that involves assigning a label to each sequence member. Deep learning has shown good performance for this problem. However, one disadvantage of this approach is its requirement of having a large amount of labeled data. Semi-supervised learning mitigates this problem by using cheaper unlabeled data together with labeled data. Currently, usage of semi-supervised deep learning for sequence labeling is limited. Therefore, the focus of this thesis is on the application of semi-supervised deep learning in sequence labeling. Existing semi-supervised deep learning approaches are examined, and approaches for sequence labeling are proposed. The proposed approaches were implemented and experimentally evaluated on named-entity recognition and part-of-speech tagging tasks.