

Title	Sentence level actor-critic method Vietnamese-English neural machine translation.
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When a piece of text is automatically translated from one language to another, this process is known as machine translation (MT). Neural machine translation refers to a solution that uses neural networks to translate text (NMT). The machine translation dataset includes not just one but two languages: the source language and the destination language. This is in contrast to other language models, where the corpus contains only one language. In short, connections between each sentence in the original language and its translated counterpart in the target language are established, and after that, these connections are used to predict translated sentences from the source sentence.

Most optimization algorithms for NMT will use token-level maximum likelihood estimation during neural machine translation training to optimize the model. However, during evaluation sequence generation, like beam search, use only the probability distribution for each time step to infer the translated sentence. The translated sentence is subsequently assessed by a corpus-level held-out set evaluator using metrics such as the BLEU score, which cannot be differentiated or decomposed.

The use of reinforcement learning in neural machine translation is expected to lessen the discrepancy between training and evaluation. However, the model is still limited by sparse rewards, which will affect the model's quality. The actor-critic method will be used to enrich the rewards when training reinforcement for neural machine translation. To achieve this goal, we propose an actor-critic approach to the sentence-level machine translation model using the BLEU score as the goal to improve the translated sentences. In this article, we achieve remarkable progress on the translation task Vietnamese-English and vice versa using PhoMT and IWSLT 2015 data sets.

Keywords: Neural Machine Translation, Reinforcement Learning, Actor-critic method.