Neural Machine Translated communication system to diminish language barrier.

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ABSTRACT

Language Barrier is one the most gruelling challenges we face in our day-to-day life. Person can be skillful in his/her work but may fail in many places just because of the language barrier. Even in colleges, offices or in remote works, language plays a predominant role in communication.

To diminish this issue, we use Neural machine translation with attention to decipher this issue. The model is basically direct to convert one source language to another targeted language using encoder and decoder architecture. The model encodes the message sent by the sender to a vector of fixed length and decoder generates the translated message which is received by the receiver in their communication system(chat application) automatically. We use the Bahdanau Attention mechanism in our communication system. Using an automatic language translation system, people can be connected around the world and talk in their own mother tongue through the neural machine translated chat application.

1. Introduction

Neural Machine Translation is the way of encoding and decoding the given source and the target corpus respectively.

The model is designed to train a single and large neural network in order to predict correct translation by reading the given sentence. Following architecture uses an attention model in order to ameliorate the translation where the input sentence may contain long term dependencies.

While speaking, a human's brain remembers only the important keyword while someone speaks and understands the theme of the sentence. So, in the attention model, the machine remembers only the important keyword from the sentence and uses it to decode the sentence. After we pass the source sentence into the encoder, the neural network reads the sentence and encodes it into the fixed-length vector. After this, a decoder outputs translation using the encoded vector. It uses conditional probability from the encoder to get maximum probability in output given a source sentence.

One problem in having a fixed length vector is that it may not be efficient for the longer sentences. It may be difficult to squeeze the longer sentence in a fixed length vector. So, it won’t takes whole input sentences into a single vector instead, It encodes the input sentence into a separate sequence of vectors and chooses a subset of these vectors pliant

while decoding the translation. This helps the model to handle longer sentences. In each time stamp, a model generates a word in a translation, it

searches for the most favourable word from the source sentence and concentrates it with the previous generated word and so on. The model then predicts a target word based on the context vectors kindred with

these source locus and all the previous generated target words.

After getting the translation with great performance, we are ready to deploy our model to our chat application system where users are allowed to select their favourable language. For this proposed research project, we use only spanish-english language pair as a prototype. To communicate with the person that talks in Spanish, we send the message in English language which is converted by encoder-decoder attention model into Spanish language and the receiver gets the message in Spanish. Likewise, if the receiver replies in Spanish, the sender gets the message in English language.