**LIGN 167 Final Project Proposal**

**Neural Machine Translation**

**1 Background**

During these years, there were lots of researches[1] and improvements on Neural Machine Translation. For instance, the appearance of Attention helped NMT[2] model performance better in capturing crucial texts in sentences.

We are going to accomplish the architecture of Bi-Directional LSTM/RNN according to some previous papers to realize the Neural Machine Translation(Auto-translation), from English to Chinese or Chinese to English. We have also found some related datasets about English and Chinese corpus [3]. Based on that, we will research on some relevant engineer tricks to make improvement on the performance of translation.

**2 Tentative Plan**

Initially, we are going to research on state-of-the-art models and tricks for neural machine translation that could be implemented under given time limitation and computing resource condition. Then we will start implement the first baseline architecture according to RNN and LSTM models. At the same time, we will study on some advanced architectures and tricks (like attention [4], bidirectional, beam search, batch size, greedy decoding, etc.) on related publications and evaluate whether they are able to be applied to our baseline model.

After obtaining our baseline models, we will try to explore how can we optimize the performance or efficiency of our models based on publicized tricks or hyper-tuning or make some modifications on the models. In the end, we will do analysis on the performance. If there is obvious improvement on our latest models compared to our baseline models, we would intuitively or even mathematically explain such optimizations.

**3 Evaluation**

We will use BLEU (bilingual evaluation understudy) to evaluate our result from different models and tricks. Higher BLEU score indicates better performance. In addition, we will manually check some of our produced results to see if the translation really make sense. We will also focus on the training efficiency of our implemented models and methods depends on the project progress.

**References:**

[1] https://github.com/VectorFist/RNN-NMT/tree/master/NMT/nmt\_data\_en\_ch

[2] https://arxiv.org/pdf/1609.08144.pdf

[3] <http://www.statmt.org/wmt17/translation-task.html>

[4] Attention Is All You Need. <https://arxiv.org/abs/1706.03762>