**Sequence to Sequence Networks for Roman-Urdu to Urdu Transliteration.**

**Summary:**

In the above mentioned paper, the researches proposed a sequence to sequence network model for the transliteration of Roman-Urdu to Urdu script. They used LSTM (Long short-term memory) based encoder decoder neural network model with 3 layers to achieve high training efficiency and transliteration quality. And to help LSTM based encoder decoder neural network model better understand the relationship between two languages the LSTM model was given words in the vector representation using word2vec for both the languages. The sequence to sequence model is based on *Sequence to Sequence learning with neural networks (Sutskever, Q.V.Le)*.

**Strengths:**

* Created first ever parallel corpora for Roman-Urdu to Urdu transliteration.
* Created first ever distributed representation of Roman-Urdu.
* Presented the model for Roman-Urdu to Urdu transliteration.
* If the word is not known, it gets replaced with UNK(unknown).

**Observations:**

* The sequence to sequence network model achieves the state-of-the-art result for Roman-Urdu to Urdu Transliteration which is **50.68 BLEU** score on train data and **48.6 BLEU** score on test data.
* If a word is misspelled, shortcuts in message or slang used the model comes with the most probable word it can replace with.

For example: *mujh per zulmi hua* the model converts it into the correct sentence in Urdu script as *mujh per zulm hua*.

* For incorrect predictions, the model makes a smart choice by predicting a word which is similar nature i.e. noun for noun, preposition for preposition etc.

**Weakness:**

* The accuracy word limit in a sentence is set 10, which is less but as proposed in the paper it can transliterate upto length 15. But the BLEU score is calculated with length 10 so a restriction.
* No techniques to handle rare words were proposed.
* More work needed to increase the speed of the model.
* The performance of the network can be increased if bi-directional encoders with attention mechanism are used.