Style Transfer in Text: Exploration and Evaluation

Introduction:

Language style transfer is the problem of migrating the content of a source sentence to a target style. In many applications, parallel training data are not available and source sentences to be transferred may have arbitrary and unknown styles. The key idea behind the proposed models is to learn separate content representations and style representations using adversarial networks. We propose two models to achieve this goal. We will replicate two models proposed in this paper in first phase of our project.

Proposed Models:

1. Implement a multi-decoder seq2seq where the encoder is used to capture the content c of the input X, and the multi-decoder contains $n(n \geq 2)$ decoders to generate outputs in different styles.
2. Use the same encoding strategy, but introduces style embeddings that are jointly trained with the model. The style embeddings are used to augment the encoded representations, so that only one decoder needs to be learned to generate outputs in different styles.

Proposed Evaluation Metrics

Considering the problem of lacking principle evaluation metrics, we propose two novel evaluation metrics that measure two aspects of style transfer: transfer strength and content preservation. We benchmark our models and the evaluation metrics on two style transfer tasks: paper-news title transfer, and positive-negative review transfer. Results show that the proposed content preservation metric is highly correlate to human judgments, and the proposed models are able to generate sentences with similar content preservation score but higher style transfer strength comparing to autoencoder.

Improvements:

1. Current model will mainly work for paper-news title transfer and positive-negative review transfer. We will experiment for domains like poetry and novels.
2. We will extend the dataset for the Indian authors and make changes in the architecture accordingly to extract the required features in order to make the model robust.
3. To increase the efficiency of the model, we will work on network architecture for better set of feature extraction.

Timeline:

1. First Phase of Evaluation: Finish implementation of research paper.
2. Work on above mentioned improvements.

Github Link:

https://github.com/harshi12/Style-Transfer-in-Text.git

Team Members:

1. Harshita Agrawal (2018201014)
2. Supriya Priyadarshani (2018202009)
3. Rajat Kumar Verma (2018201040)
4. Anjul Gupta (2018201021)

Faculty Name:

Dr. Ravi Kiran Sarvadevabhatla