Automatic Compliment Generation

CS 497: Applied Deep Learning

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1 MOTIVATION

The aim of this project is to build a deep learning model that can aid users in automatically generating compliments, given their picture and a short description of their mood. In this case, users feeling sad or depressed will be able to feel better by receiving automatically generated relevant compliments. We will be using a Jupyter notebook for both design, exploratory analysis, and experiments. This project will be written in Python and Keras will be the preferred deep learning library.

2 DATA

We will scrape and clean our data from Reddit, specifically the subreddit r/toastme. This subreddit is filled with users who post an image of themselves, along with a short description of their mood, and then hundreds of other redditors respond with compliments and positive messages. We will use the Python library PRAW to act as a wrapper around the Reddit API. We will then download the top thousand posts, along with their top-level comments.

3 PRIOR WORK

We plan to use existing image captioning machine learning models and then iterate upon them for our application. Image captioning models leverage both a CNN to extract the visual features of an image, as well as an LSTM to generate the text. We can train our own model from scratch by leveraging existing Keras Image Captioning models such as the model made by Vinyals et al. [3].

4 METHODOLOGY

We will train the existing image captioning Keras models with our own cleaned Reddit r/toastme data. The inputs to the model would be the image of a person and the corresponding description (the title of the post). The output is a compliment generated by the model. The image captioning model by Vinyals et al. [3] uses a CNN followed by a Fully Connected Neural Network, followed by an LSTM. We would change this structure by also adding in an input description to the Fully Connected NN. The description would be taken from the title of the post, and we can simply sum the word2vec [1] vectors of every word as the input feature vector of the description.

5 EVALUATION

To determine the validity of our model, we will use the BLEU metric [2] to evaluate the quality of the compliments the model generates. This is the same evaluation metric used by Vinyals et al [3].

REFERENCES

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[3] Oriol Vinyals, Alexander Toshev, Samy Bengio, and Dumitru Erhan. 2014. Show and Tell: A Neural Image Caption Generator. *CoRR* abs/1411.4555 (2014). arXiv:1411.4555 http://arxiv.org/abs/1411.4555