

Smart Reply Generation for SMS Using Natural Language Processing

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The use of Short Message Service (SMS) is increasing due to the rapid increase in mobile phone usage and the simplicity in sending SMS messages. With the increasing complexity of human lives, people are seeking more efficient activities to save time. This research proposes an end-to-end method that automatically generates short responses known as Smart Replies by identifying the content of an SMS using natural language processing. There are a few pieces of research done on the topic of Smart Reply. Most of them are carried out for the emails. And the efficiency and the size of those existing models cannot be used in an offline mobile device. The application will use Natural Language Processing to process an incoming message and then uses a neural network to predict the most likely responses which will allow us to send it directly or edit it before sending it to the recipient. The Ubuntu Corpus dataset was used for training and testing the model by analysing its properties. It is identified that there are three main approaches: TF-IDF, Recurrent Neural networks (RNN), and Long Short-Term Memory (LSTM) that can be used in the model. After a performance test, identified the most suitable approach is LSTM. Accordingly built a Sequential Neural Network with a Dense with sigmoid activation using LSTM. Finally, extract the highest three responses from the trained model to show in the SMS application. This proposed model achieved around 92% percent of accurate results and it can be used offline and also it is a lightweight file that can be easily handled in a mobile device.

Keywords: Smart reply, SMS, Natural language processing, Long short-term memory, Sequential neural network