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CUSTOMER SENTIMENT ANALYSIS FROM AUDIO DATA USING DEEP LEARNING

Call Centers or Support Centers in different companies aggregate huge amount of audio data everyday. From all the conversations, few conversations demonstrate the disappointment of clients towards services, products or delivery. Finding the sentiment of the customer helps in determining whether the customer was satisfied with the service, product or not. However, manually analyzing the huge amount of audio data is time consuming, laborious, and burdensome. The aim of this research is to develop the deep learning based model which would enable to automatically evaluate the sentiment of a customer throughout a conversation with a call center agent.

In this work, we developed Long Term Short Memory (LSTM) based deep learning models for customer audio call data analysis. The proposed pipeline consists of two sequential steps: a) Audio transcription: speech recognition of the conversations and document them in text; and b) Sentiment Analysis: conduct the sentiment analysis on the text data using Natural Language Processing (NLP). We compute spectrogram features from audio data and then fine-tune the LSTM based Deep Speech Model using customer call data. Deep Speech model can successfully transcribe the conversations between client and call center agent in a text form. Then we compute the 1-gram feature from text data which find the occurrence of the words responsible to identify the customer sentiments. We fed this feature into a LSTM based deep architecture which would enable to detect customer sentiments from text data. Recent advances in natural language understanding and generation facilitates to detect customer sentiments successfully as accurate as human experts.

Both speech transcription and sentiment analysis part of the proposed tool are very generic in nature which could utilize for other audio data transcription and text sentiment analysis purposes. Tools were developed in python which can be easily transported and adapted in other programming environments.

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