Chapter 77

Sentiment Recognition in Customer Reviews Using Deep Learning

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ABSTRACT

Deep learning has become popular in all aspect related to human judgments. Most machine learning techniques work well which includes text classification, text sequence learning, sentiment analysis, question-answer engine, etc. This paper has been focused on two objectives, firstly is to study the applicability of deep neural networks strategies for extracting sentiment present in social media data and customer reviews with effective training solutions. The second objective is to design deep networks that can be trained with these weakly supervised strategies in order to predict meaningful inferences. This paper presents the concept and steps of using deep learning for extraction sentiments from customer reviews. The extraction pulls out the features from the customer reviews using deep learning popular methods including Convolution neural networks (CNN) and Long Short-Term Memory (LSTM) architectures. The comparison of the results with tradition text classification method such as Naive Bayes(NB) and Support Vector Machine(SVM) using two data sets IMDB reviews and Amazon customer reviews have been presented. This work mainly focused on investigating the merit of using deep models for sentiment analysis in customer reviews.

INTRODUCTION

The digital business is a philosophy of current business, which addresses the constant necessities of business associations. It can be extensively characterized as the way toward sharing business data, keeping up business connections, and directing business exchanges by methods for correspondence systems (Jain & Kumar,2016a).

To be fruitful in the internet business, an organization must form a website that holds the accompanying properties. It must be imaginative, must include esteem, and gives data and collaboration not generally accessible; it must make discussions for supposition building exercises (Schneider J., 2015).

The rapid development of Web 2.0 applications such as micro-blogging, social networks, news portals and web-forums etc. provides a major source of user-generated data in the form reviews, comments, recommendations, ratings and feedbacks which are useful for businesses, governments, and individuals (Alghamdi, E. 2013). The major attraction where digital business lies is in the area of sentiment analysis. Sentiment analysis has been widely used in areas like healthcare, stock markets, sports, customer review analysis etc. The concept behind this task is to classifying the polarity of a given document or text (Jain & Kumar, 2016b).

Indian social media users have rapidly evolved over the past few years to form a complete ecosystem which deals in several areas such as news, politics, health, government policies and finance. Social media data have been a primary focus in the field of data recovery (IR) and content mining because of an unnecessary measure of unstructured information continuously (Jain et al.,2017). There are a rising number of web-based social networking platforms and a quickly developing client base over every single web-based services (Jain and Kumar, 2015b). Long range informal communication locales have turned out to be quick and minimal effort correspondence that empowers fast and simple access to data among potential social media users. The generated unstructured data provides valuable knowledge which constitutes a big opportunity for creating new services for governments, businesses or individuals. Exploiting these unstructured data created a new field called opinion mining and sentiment analysis.

From the e-commerce perspective, receiving consumer reviews/feedbacks can significantly improve its business action plan in order to increase profits. These reviews help in gaining business intelligence and improving customer satisfaction. It is common to find products with millions of opinions, thus, it could be a hard task for a customer to analyze all of them. Sentiment analysis tool and social media platforms help the customer in decision making.

Deep neural networks represent the most popular machine learning techniques to address complex Text mining and Natural Language Processing (NLP) tasks. These models best fitted when the amount of data is large such as social media data, blogs, customer reviews etc. Such models are designed to devise optimal approaches to training the deep models without direct supervision. This paper has been focused on two objectives, firstly is to study the applicability of deep neural networks strategies for extracting sentiment present in social media data and customer reviews with effective training solutions. The second objective is to design deep networks that can be trained with these weakly supervised strategies in order to predict meaningful inferences.

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