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An adaptable fine-grained sentiment analysis for summarization of multiple short online reviews

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Abstract

In this study, we present a novel method in generating summaries of multiple online reviews using a fine-grained sentiment extraction model for short texts, which is adaptable to different domains and languages. Adaptability of a model is defined as its ability to be easily modified and be usable on different domains and languages. This is important because of the diversity of domains and languages available. The fine-grained sentiment extraction model is divided into two methods: sentiment classification and aspect extraction. The sentiment classifier is built using a three-level classification approach, while the aspect extractor is built using extended biterm topic model (eBTM), an extension of LDA topic model for short texts. Overall, results show that the sentiment classifier outperforms baseline models and industry-standard classifiers while the aspect extractor outperforms other topic models in terms of aspect diversity and aspect extracting power. In addition, using the Naver movies dataset, we show that online review summarization can be effectively constructed using the proposed methods by comparing the results of our method and the results of a movie awards ceremony.

Keywords: Review summarization; aspect extraction; sentiment analysis; short texts; online reviews

1. Introduction

The Internet has become a pivotal channel of communication and interaction between online consumers and producers. Social media where the communication between two parties take place have rich but unorganized content contributed by users, often in fragmented and sparse fashion. Normally both consumers and producers refer to online reviews for several reasons [1]. Consumers look at them to decide whether to purchase the presented product/service or not based on their demands. Producers, on the other hand, look at them to improve their market strategy by magnifying the positive aspects and improving the negative ones. Vermeulen et al. [1] and Ye et al. [2] showed that the existence of online hotel reviews enhances hotel consideration in consumers and business performance of hotels. Duan et al. [3] also showed with the use of online movie reviews as data that the volume of online reviews significantly influences the sales. Chatterjee [4] also looked at the influence of negative consumer reviews on retailer evaluation and patronage intention.

Meanwhile, although the amount of information is constantly increasing, information available on the Internet is slowly becoming shorter. The most popular example of this trend is Twitter. Also, there are a few and growing number of online review websites that follow Twitter's short character limit. Both the biggest movie review websites in South Korea,

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