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COLLEGE OF ENGINEERING

MASTER'S THESIS (SUMMER 2015)

TOPIC: *SLTM: A Sentence Level Topic Model for Analysis of Online Product Reviews*

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ABSTRACT

Many e-commerce websites use the average star rating mechanism to help customers with their buying decisions; however, such average ratings are not accurate and do not necessarily reflect the actual quality of the products. To deal with this issue, users are typically allowed to provide reviews for the products they bought. Although it is a very useful service, due to large amounts of product reviews for many similar products, a user usually has a hard time to determine which product has the most desirable features that they want. In this thesis, we propose a review summary system that uses a Sentence Level Topic Model (SLTM), which can classify sentences into different classes that correspond to different product features. Similar to the probabilistic Latent Semantic Analysis (pLSA) model and the Latent Dirichlet Allocation (LDA) model, our approach adopts the idea of introducing a hidden layer, called the topic layer, between corpus and words. The data points in the training dataset can be labeled by any user through a graphical user interface (GUI). Once a SLTM is trained, by applying the Bayes' rule, it can output the most related topic for each sentence. We analyze the sentiment of each sentence in each product review, and count the number of reviews that like / dislike each product feature. Then we give a review summary for a list of similar products with highlighted strengths and weaknesses based on their features. By comparing the list of similar products, a user may have a much easier time to find the products that meet his/her actual needs. To demonstrate the feasibility of our proposed model, we use a case study of online products from Amazon, and show that our approach can greatly save customers' time and help them to make better decisions on purchasing the right online products.