In the Eye of the Reviewer: An Application of Unsupervised Clustering to User Generated Imagery in Online Reviews

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Abstract

Mining opinions from online reviews has been shown to be extremely valuable in the past decades. There has been a surge of research focused on understanding consumer brand perceptions from the textual content of online reviews using text mining methods. With the increase in smartphone usage and ease of posting images, these reviews now often contain visual content. We propose an unsupervised cluster method to understand the user-generated imagery (UGI) of online reviews in the travel industry. Using the deep embedded clustering model we group together similar UGI and examine the average review ratings of these clusters to identify imagery associated with positive and negative reviews. After training the method on the entire dataset, we map out individual hotels and their corresponding UGI to show how hotel managers can use the method to understand their performance in particular areas of customer service based on UGI. The performance in a cluster relative to the population can be a clear indicator of areas that need improvement or areas that should be highlighted in the hotel's marketing efforts. Overall, we present a useful application using visual analytics for mining consumer opinions and perceptions directly from image data.