

論文の内容の要旨

論文題目 Mining fine-grained opinions in written and video
product reviews with learned sentence representations
(文章表現学習による動画及び文章の商品レビューの細かい粒度
の意見マイニング)

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Opinion mining techniques allow us to deal with the vast availability of on-line product reviews on the Web. In particular, techniques that are able to extract fine-grained opinions regarding product features, aspects or sub-components in the reviews are of special importance in tasks such as opinion summarization and opinion-based question answering. In practical terms, fine-grained opinion mining defines the tasks of aspect extraction (AE) and aspect-based sentiment classification (SC). Deep neural network models that learn sentence representations have recently become the most effective tools for a range of hard applied natural language processing problems, including opinion mining. Learning representation offers us the dream of forgetting about manually-designed features and allows systems to rapidly adapt to new tasks with minimal human intervention. In this dissertation I first show that supervised deep learning models offer increased experimental replicability and predictive capabilities compared to unsupervised approaches for aspect extraction. I carry an in-depth replication study of the state-of-the art in both supervised and unsupervised models and provide experimental evidence indicating that the latter seem to be very sensitive to hyper-parameter tuning and that in practice they offer poor results on standard evaluation datasets. Secondly, I introduce representation learning architectures based on the encoder-decoder paradigm that make use of the semantic principle of compositionality modeled using an attentional component, to more effectively perform aspect extraction and sentiment classification. The proposed models also provide key insights on how the learning is performed, which help validate the quality of the sentence representations learned. Finally, I argue that product video reviews are the natural evolution of written product reviews and present the first fine-grained annotated dataset of video product reviews extracted from YouTube. Supporting previous studies that evidence key differences between speech and written text, I use this dataset to empirically show the existence of important differences between written and video product reviews, observing that the sentence representations learned by deep models do not fully capture their semantics and ultimately leading to important performance drops for aspect extraction and sentiment classification. I propose that most of these differences are explained by multi-channel nature of video reviews and introduce a multi-modal representation learning model that is able to use the audio and generate more comprehensive sentence representations to more effectively perform sentiment classification.