

Graduate School of Science and Technology Master's Thesis Abstract

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Thesis title	Automatic Assessment of Argument Convincingness using Causality 因果関係を使用した議論の説得力の自動評価		
Abstract			
<p>Argument convincingness assessment is a task to assess the degree of convincingness of an argument for a given debatable topic. In order to have a fruitful debate with a human, a system should come up with top-notch convincing arguments even for the most delicate topics. Previous work pointed out that arguments which are long, contain more details, more reasons, and facts tend to be more convincing. However, they did not consider the possibility of causality to judge the convincingness of arguments. To the best of our knowledge, this work is the first attempt towards assessing argument convincingness using causality. A causality or causal relation is a relation between two events, beliefs, behaviors, or things such that one is the effect of the other. For example, for a given topic “We should adopt open-source software” and a topic-related argument “.....adoption of open-source software results in savings of consumers”, the argument contains expressions for causality (i.e., “adoption of open-source software” as a cause and “savings of consumer” as its effect) that supports the convincingness of the argument. Our manual analysis on a subset of arguments also revealed that causality is an important indicator for argument convincingness. Inspired by this analysis, we hypothesize that causality will be useful to identify more convincing arguments.</p> <p>To test our hypothesis, we propose novel modifications to a RoBERTa-based classification model so that it can leverage causality for assessing argument convincingness. Causality is leveraged in the following two ways: 1) a special causality token is concatenated with an argument to indicate that the argument has a causality with the corresponding topic and 2) each token embedding of an argument is augmented with the causality token embedding to obtain better representation of the argument. To determine whether an argument has a causality relevant to a given topic, we use an automatic causality detector created via fine-tuning a standard RoBERTa model, further augmented via paraphrasing. Our experiments for argument convincingness assessment using causality show that no statistically significant improvement in the performance is obtained even though the result of our proposed method is comparable with the standard RoBERTa baseline. Our work paves the way for further exploitation of causality to improve the quality of arguments during argumentation.</p>			