Towards a More In-Depth Automated Framing Detection: Synergizing NLP Techniques and Formal Semantics

Qi Yu (University of Konstanz)

Framing is a ubiquitous tool to promote opinions or policies in political discourse: it describes the strategic maneuver of information senders to deliberately make certain aspects of an issue more salient while excluding or downplaying the others (Entman 1993; Druckman 2011). Ultimately, framing aims to influence the public’s opinions and behaviors.

In the field of natural language processing (NLP), recent years have witnessed a growing interest in the task of automated framing detection. However, most of the NLP studies to date oversimplify framing as a mere matter of topic coverage (see Ali and Hassan 2022 for a survey). This provides only a limited understanding of the intricate mechanics of framing, resulting in two research gaps: first, little is known about the linguistic facets contributing to framing by now. This is mainly because most studies use neural network-based approaches that do not allow for drilling down into the effects of linguistically meaningful components. Second, the earlier studies exhibit a strong bias towards English, as most of the studies apply supervised approaches which rely on intense manual annotation effort. Whereas several English datasets with annotations of framing were released in the past decade, to the best of our knowledge, no such resource exists for any other languages. Addressing these two research gaps, our work seeks to achieve a more in-depth framing detection through the following novel contributions:

At the theoretical level, drawing from a comprehensive review of works on framing theory in social sciences, we point out that the prevailing topic-oriented methodologies in NLP neglect one crucial facet of framing, i.e., the interplay between media at the macro-level and individuals at the micro-level. By connecting this facet to formal semantic theory on conversation dynamics, we propose the first formal semantic modelling of framing, and illustrate the crucial roles of various topic-independent semantic and pragmatic cues in framing using this model. We introduce the notion of rhetorical framing to characterize the framing effect of such cues, a new dimension of framing besides the well-studied topical framing.

At the methodological level, utilizing a large-scale corpus of German political news on the event “European Refugee Crisis” (2014-2018), we demonstrate with a series of computational experiments that consciously incorporating linguistically motivated features for rhetorical framing into NLP methods can yield crucial information for framing detection. As outcomes of this work, we release two tools for framing analysis: (a) the web application LiAnS (Linguistic Annotation Service), an NLP pipeline for automated disambiguation and annotation of topic-independent rhetorical framing features, and (b) the statistically compiled lexical resource Refugees and Migration Framing Vocabulary for the analyses of topical framing in the discourse of immigration. Overall, our work marks a step towards successfully incorporating theoretical linguistic insights into NLP applications.

References

