Automatic detection of argumentative frames: solutions and challenges

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In this contribution I discuss two methodologies to identify frames with an argumentative value at scale, leveraging Frame Semantics and Congruity Theory.

Rationale: Although in Communication Science framing in argumentation has been investigated from a theoretical perspective, Natural Language Processing studies have addressed the empirical task of automatically identifying frames and their argumentative potential only recently. The majority of the unsupervised approaches have either analyzed framing from the perspective of topic-modeling or keyword clustering or treated frames as domain labels, thus not shedding lights on frames' argumentative potential. Regardless the approach, lexical semantics aspects have been largely neglected.

Frame semantics approach:[1] Rather than formulating frames as unsupervised topic labels, a context/domain and genre-independent methodology for frame identification leveraging Frame Semantics is proposed. As a dataset the WEBIS (Ajjour et al., 2019) corpus which contains 1,623 domains and 465 topics is used. First, the parser SEMAFOR is run over corpus. As a second step, to select those frames which bear more relevance, the Keyphrase Digger (KD) (Moretti et al., 2015) tool for key concept extraction is run on the WEBIS arguments and semantic frames which overlap with key concepts are selected. Options for evaluating the performance are discussed.

Congruity theory & hashtags approach: Focusing on the hashtag #*genocide* on Twitter in relation to the Ukriane-Ruassia war, it is shown that hashtags, working as frames, can constitute proxies for advancing standpoints and arguments depending on their semantic features. A methodological pipeline is proposed where the presuppositions and entailments of the lexical items making up the hashtags are mapped onto their framing functions, further constrained by the position of the hashtags and their discursive value.

References: • Ajjour, Y., Alshomary, M., Wachsmuth, H., & Stein, B. (2019, November). Modeling frames in argumentation. In *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP)* (pp. 2922-2932). • Moretti, G., Sprugnoli, R., & Tonelli, S. (2015). Digging in the dirt: Extracting keyphrases from texts with kd. *CLiC it*, *198*.

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[1] This is ongoing co-work with Dr Debanjan Ghosh, Educational Testing Service (ETS)