Argumentation Mining

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1 Definiton of Argumentation Mining

Argument(ation) Mining is the automatic identification of the argumentative structure contained withing in a piece of language [Lawrence and Reed, 2017].

Argument mining is automatic extraction of arguments from natural text [Aker et al., 2017].

2 Tasks of Argumentation Mining

1. Identifying argumentative segments in text [Ajjour et al., 2017, Stab, 2017]
2. Clustering recurring arguments [Boltužić and Šnajder, 2015, Misra et al., 2017]
3. Recognizing argument schemes [Feng and Hirst, 2011].
4. Prediction of structure (connecting premises to claims) [Aker et al., 2017, Lawrence and Reed, 2017]
5. Claim detection (can be similar to argument segments in text) [Levy et al., 2017]. Can be context dependent [Levy et al., 2014] or independent [Lippi and Torroni, 2015]

2.1 Identifying argumentative segments in text

Unit segmentation consists in the splitting of a text into its argumentative segments (ADU) and their non-argumentative counterparts. [Ajjour et al., 2017]

[Persing and Ng, 2016] rely on handcrafted features based on the parse tree of a sentence to identify segments. [Stab, 2017] uses sequence modeling and sophisticated features to classify the argumentativeness of each single word based on its surrounding words. [Eger et al., 2017] employ a deep learning architecture using different features based on the entire essagt [Al Khatib et al., 2016] have a rule-based where they suggest where the arguments should be split before the actual argument annotation (annotators could merge arguments back). [Aker et al., 2017] determine if a sentence is a claim, premise or none. They work on a sentence boundary.

2.2 Prediction of structure

[Lawrence and Reed, 2017] have annotated debates on "Moral Maze" and created argument diagrams via AIFDB. They aim to recognize the support relation from text (inference or non-inference). [Aker et al., 2017] use claim-premise pairs and go full Carteisan on them, making negative examples for those who aren't linked in the gold set. They work on the [Stab and Gurevych, 2017, Aharoni et al., 2014] datasets.

3 Unsupervised approaches to Argumentation Mining

Lack of large datasets for argumentation mining is one of the largest concerns of the community.

[Habernal and Gurevych, 2015] try to use unsupervised features for better argument component identification from online debate portals. [Al-Khatib et al., 2016] apply distant supervision to automatically create a large annotated corpus from online debate portals with argumentative and non-argumentative segments from several domains. [Lawrence and Reed, 2017] try to use web search in combination with *therefore and because* discourse indicators in addition to some other filtering. They make their own premise-conclusion pairs by searching the web for the discourse marker and then use LDA to predict support/non-support relations. [Levy et al., 2017] do unsupervised claim detection where they extract sentences with 'that' words in them and use them for claim detection. They acquire the sentences from Wikipedia (which is kind of distant supervision). They evaluate their work through crowdsource labeling of the data.

4 Predicting support relations

Predicting support relations is similar to textual entailment, but involves more contextual knowledge and common-sense reasoning since the semantic distance is greater. Also, it is not strictly a logical relation and (with a well-defined hypothesis–text relation), but (usually) there is a direction defined. [Lawrence and Reed, 2017] constructs a corpus using web-search and a gold set then does supervised classification whether a sentence supports (infers) another.

5 Cross-domain argumentation mining

[Ajjour et al., 2017] do argumentative unit segmentation on three corpuses: Habernal's Web Discourse, Stab's Essay corpus, and Editorials to show how cross-domain argumentative unit segmentation is a huge problem as it is defined today and even end with open questions about how should segmentation and argumentative units be defined.

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