

# AsseSS: A Tool for Assessing the Support Structures of Arguments in User Comments

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**Abstract.** We present AsseSS, a tool for identifying and assessing the support structures of arguments in user comments. Given a comment, the system first classifies elementary units of arguments comprising the comment based on the type of appropriate support. Then, it detects support relations among the elementary units. With this information, it is possible to decide whether the existing support relation is of suitable type. Also, in the case that no support has been provided for an elementary unit, an appropriate type of support can be determined.

**Keywords.** Argumentation, Online User Comments

## 1. Introduction

The focus of argumentation mining is to identify, extract and analyze argumentative structures in documents [1]. Existing work in argumentation mining typically defines an *argument* as a set consisting of one conclusion and at least one supporting premise. Under this definition, unsupported propositions, i.e. propositions without supporting evidence or reason, are not considered as arguments and are ignored. However, rapidly increasing user participation on the internet has led to a rise in the amount of user comments containing such unsupported propositions, or *implicit arguments*. To process them, a system that can recognize the support structures of arguments, even *implicit* ones, are needed. Such a system can guide commenters by detecting propositions with missing or inappropriate types of support and suggesting an appropriate type of support. It can also benefit readers by recommending comments with arguments consisting of appropriate support.

## 2. Overview of AsseSS

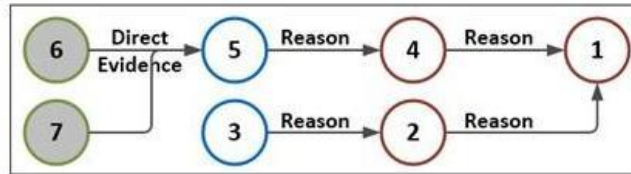
The goal of AsseSS is to capture and assess the support structures of arguments in user comments while abstracting away other details. Each proposition is viewed as a conclusion of an argument and classified based on the appropriate type of support, which can be either objective evidence or reason [2]. Thus, the entire comment is a set of interconnected arguments, where the conclusion for an argument can be a support in another argument.

While we have not developed a visualization component yet, Figure 1 shows how the output of AsseSS can be visualized. Note that, with such representation, we can easily

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<sup>1</sup>There should be a full ban of peanut products on all airlines,<sup>2</sup>because peanut allergy could have terrible effects.<sup>3</sup>Peanut reactions can be life threatening.  
<sup>4</sup>Restricting to certain flights is not enough,<sup>5</sup>as residue from previous flights can remain on the seats.<sup>6</sup>Recently we flew across the country<sup>7</sup>and I find left over peanuts in our seats!



UnVerifiable / Verifiable & Non-Experiential / Verifiable & Experiential

**Figure 1.** Visualization of the Output from AsseSS for an Example Comment

The outline colors of the nodes represent the types of elementary units, and the gray fill color means that the given elementary unit is of a type that need not be supported.

assess the support structure: For instance, Proposition 3 is lacking support (because there is no incoming edge), and the support should be an evidence (because it is a VERIFIABLE & NON-EXPERIENTIAL proposition).

### 3. Major Phases

**Argumentation Detection:** Given a comment, AsseSS first determines the spans of the text that form arguments. At this stage, non-argumentative statements like greetings and questions are discarded.

**Elementary Unit Classification:** The remaining text is classified into elementary unit types based on the type of appropriate support. See [2] for details.

**Support Relation Identification:** Reason relations, one type of support relations, among elementary units of arguments are identified by determining causal relations among nearby elementary units, leveraging on the results from discourse analysis [3]. The potential support for a given elementary unit is simply the elementary units that fall within a window size. A limited number of evidence relations are detected with rules like *a URL surrounded in parenthesis provides evidence for immediately preceding proposition*<sup>2</sup>. Comparing the keywords in the webpage pointed by a given URL and propositions potentially supported by it may be a promising way to detect the evidence relation.

### References

- [1] R. M. Palau and M. Moens. Argumentation Mining. *Artificial Intelligence and Law*, 19(1):1-22, 2009.
- [2] J. Park and C. Cardie. Identifying Appropriate Support for Propositions in Online User Comments. *Proceedings of the First Workshop on Argumentation Mining. Association for Computational Linguistics*, 2014.
- [3] J. Park and C. Cardie. Improving Implicit Discourse Relation Recognition Through Feature Set Optimization. *SIGDIAL*, 2012.

<sup>2</sup>Note that an objective evidence is typically given as a URL or a citation, neither of which has a discourse relation with the proposition supported.