

1. Introduction

An argument represents an opportunity for a human or a system to convince an interlocutor of the veracity of its own beliefs or modify the interlocutor's opinions. All approaches treating argumentation in dialogue to detect how agents alter their beliefs have in common the need to bring the three separate worlds of argumentation, dialogue and beliefs together. However, most of the works (Godden, 2010; Kraus et al., 1998; Parsons & Sklar, 2005; Reed et al., 1996) still consider dialogue as a mere sum of arguments only containing attacking and defending moves. This perspective deprives dialogue of its own internal structure made of rhetorical relations and make the analyses suitable only for pre-constructed examples of interactions.

2. Definitions

Argument: A structure composed by a set of premises, a conclusion and some default inferential rules between the premises and the conclusion.

Beliefs: Express the commitment of a speaker to his/her own utterance or, in the case of dialogue, to a second speaker's utterance.

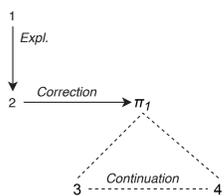
Dialogue: Informally defined as an exchange between two or more speakers. Utterances in a dialogue have a continuous effect on the mental state (e.g. beliefs, desires and intentions) of a second speaker.

3. Issues and Research question

1. Dialogue-driven approaches to ARG

No account for the argument structure

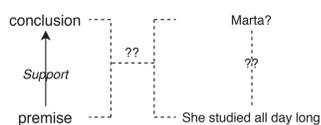
- (1) - [Clara will fail her exams.]₁ [She did not work hard.]₂
 - [Clara?]₃ [She worked non-stop.]₄



2. ARG-driven approaches to dialogue:

No account for the dialogue structure

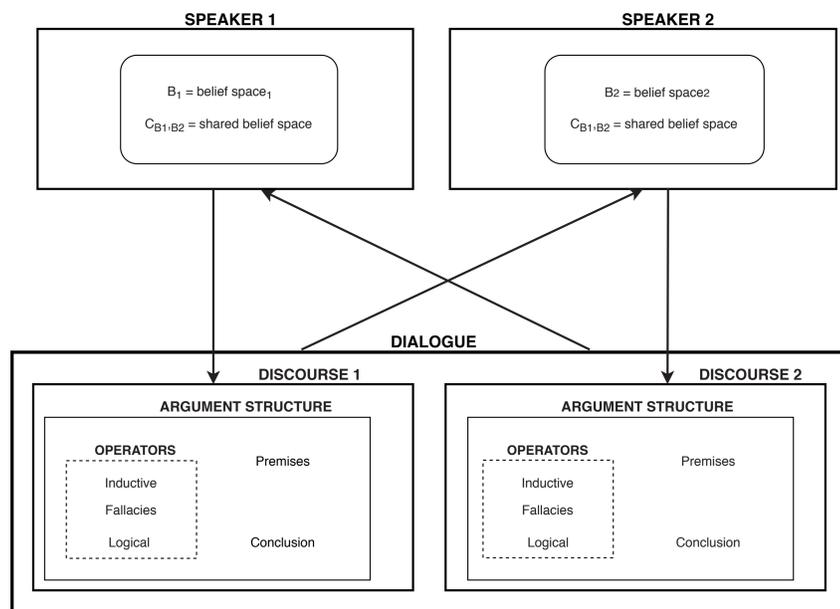
- (2) A₁: [Marta will fail her exams.]_{conclusion}
 [She didn't study] _{premise}
 B₁: [Marta?]_? [She studied all day long.]_?



We must place the belief modelling at the interface between 1 and 2. How do we account for beliefs dialogue and argumentation together?

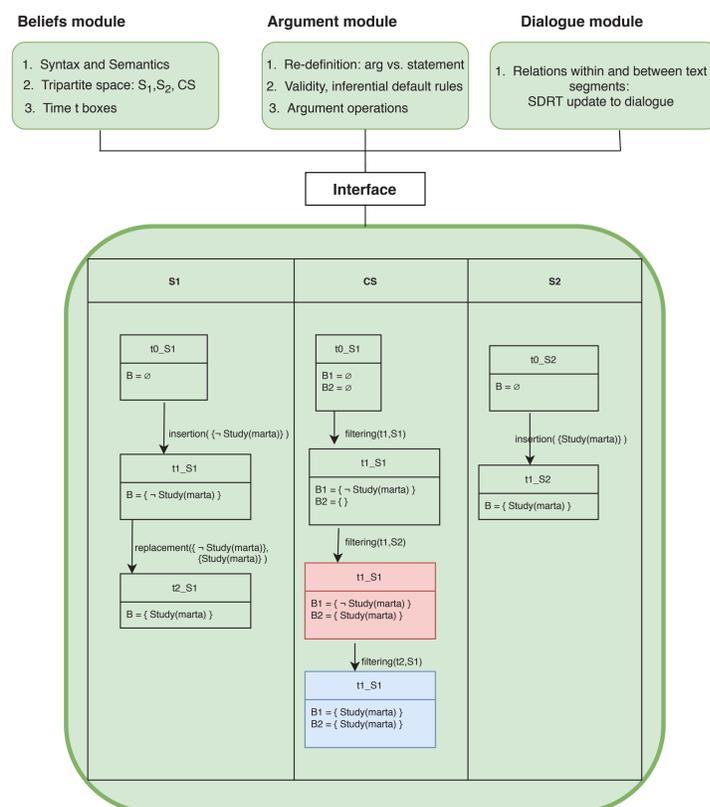
4. Proposed modular solution

In this modular architecture belief change is detectable together with its context of change.



5. Preliminary modelling

- (3) S₁: [Marta didn't study.]_{t1}
 S₂: [Marta studied all day long] _{t2}.
 S₁: [Oh, I didn't know this] _{B_{S1}(B_{S2})=true.}



References

- [1] Andreas Peldszus. Automatic recognition of argumentation structure in short monological texts, 2018.
- [2] Stergos Afantenos and Nicholas Asher. Counter-argumentation and discourse: A case study. CEUR Workshop Proceedings, 2014.
- [3] Simon Parsons and Elizabeth Sklar. How agents alter their beliefs after an argumentation-based dialogue. 2005.

6. Conclusions

The architecture as a whole should allow the followings:

1. Keep statements and argument structures separate.
2. Keep track of the beliefs associated to a statement and an argument.
3. Integrate both dialogue and argument relations between text segments.
4. Detect what is the context of the belief change (e.g. *disagreement*, *argumentation*, *rebuttal*) and what update mechanism took place at the level of beliefs.