

The ASPARTIX system suite

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1. System Description

In this system description we briefly describe the ASPARTIX system for reasoning with different abstract argumentation formalisms.

The ASPARTIX system was one of the first systems that supported efficient reasoning for a broad collection of abstract argumentation semantics starting with the work of Egly et al. [1,2] and has been continuously expanded and improved since then (see, e.g., [3,4,5]). From the very beginning the system was not limited to Dung’s abstract argumentation frameworks (AFs) [6] but supported several enhancements and generalizations of AFs by, e.g., preferences or recursive attacks. Most recently, it has been extended by support for argumentation frameworks with collective attacks and claim-augmented argumentation frameworks and has been optimized for ICCMA’19 [5].

ASPARTIX is based on answer-set programming (ASP) and the idea of characterizing argumentation semantics via fixed ASP encodings. With an encoding of a semantics one can easily apply state-of-art systems for ASP to solve diverse reasoning tasks or to enumerate all extensions of a given framework. We briefly sketch the basic workflow of ASPARTIX on AFs. Given an AF in the `apx` format of ICCMA [7] as input, ASPARTIX delegates the main reasoning to an answer set programming solver (e.g., `clingo` [8]), with answer set programs encoding the argumentation semantics and reasoning tasks. The basic workflow is shown in Figure 1, i.e., the AF is given in `apx` format (facts in the ASP language), and the AF semantics and reasoning tasks are encoded via ASP rules, possibly utilizing further ASP language constructs. For more information on the ASPARTIX system and its derivatives in general, the interested reader is referred to the systems web-page: www.dbai.tuwien.ac.at/research/argumentation/aspartix/.

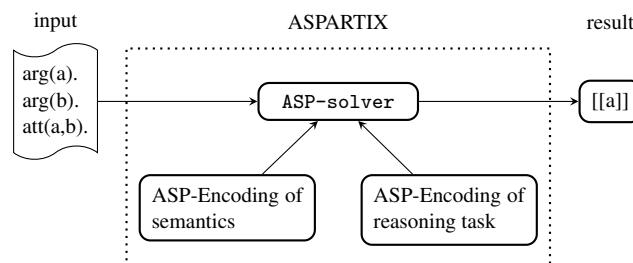


Figure 1. Basic workflow of ASPARTIX

2. Supported Argumentation Formalisms

The core of the ASPARTIX system is its support for Dung AFs [6] and a wide range of semantics, thereby facilitating enumeration of extensions as well as skeptical and credulous acceptance. On top of that there is support for several argumentation formalisms that enhance Dung AFs which are typically implemented by either combining new ASP encodings with the encodings for Dung AFs or by modifying encodings for Dung AFs to match the needs of the argumentation formalism at hand. Currently, ASPARTIX supports the following abstract argumentation formalisms: (a) Preference-based Argumentation Frameworks (PAFs) [9], (b) Value-based Argumentation Frameworks (VAFs) [10], (c) Bipolar Argumentation Frameworks [11], (d) Extended Argumentation Frameworks that allow for attacks on attacks [12], (e) Argumentation framework with recursive attacks (AFRAs) [13], (f) Argumentation framework with collective attacks (SETAFs) [14], (g) Claim-augmented argumentation frameworks (CAFs) [15].

Acknowledgments This research has been funded by DFG grant 389792660 as part of TRR 248; and by the Austrian Science Fund (FWF): P30168 and W1255-N23.

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