

DABASCO: Generating AF, ADF, and ASPIC⁺ instances from Real-World Discussions

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Abstract. D-BAS [1] is an open-source web tool for dialog-based online argumentation among non-expert human users. We present DABASCO [2], a tool that utilizes D-BAS as a source of structured argumentation data and that allows to automatically translate D-BAS data into instances of abstract argumentation frameworks, abstract dialectical frameworks, and the ASPIC⁺ framework, thus offering the fully-automated generation of benchmark data from real discussions.

Keywords. argumentation, real-world, D-BAS, argumentation framework, abstract dialectical framework, ASPIC⁺

Mapping real-world argumentation data to instances of formal argumentation models is a challenging, but necessary part of ensuring the applicability of such models. While a lot of research focuses on the analysis of natural language discussions in order to retroactively extract structural information, the online argumentation tool D-BAS¹ allows a different approach. With D-BAS, users provide their arguments as logically connected statements, where the individual statements themselves do not hold any logical structure. Thus, the users' intended logical relations between statements are known to D-BAS at run time, making D-BAS discussions naturally structured. DABASCO² utilizes this and allows to automatically translate D-BAS discussions into formats of formal argumentation models. Together with suitable solvers for reasoning problems in these models, D-BAS and DABASCO constitute a fully automated discussion evaluation pipeline.

DABASCO offers the automatic translation of D-BAS data into instances of abstract argumentation frameworks (AF) [3], abstract dialectical frameworks (ADF) [4], and the ASPIC⁺ framework [5], while offering a variety of parameters to customize the way that a D-BAS discussion is encoded. We briefly sketch the different encodings. The AF export is based on a translation by Wyner, Bench-Capon, Dunne and Cerutti [6] and creates two AF arguments for each D-BAS statement (representing the negated and non-negated statement) and one AF argument for each D-BAS argument. Attacks exist between statements and their negation, from statements to arguments that have the negated statement as a premise, and between each argument and the statement that represents the negation of the argument's conclusion. Additional settings allow to include a single user's opinion on the acceptance status of some statements, which is either strictly enforced or which competes

¹<https://github.com/hhucn/dbas>

²<https://github.com/hhucn/dabasco>

with the acceptance of conclusions of D-BAS arguments. The ADF export is based on a translation by Straß [7]. It requires a user opinion and creates two ADF statements (representing the negated and non-negated element, respectively) for each D-BAS statement, for each D-BAS argument and for each D-BAS statement that occurs in the opinion. ADF acceptance conditions are created such that each D-BAS statement is acceptable if and only if the respective negated statement is not acceptable and if the statement is accepted in the user opinion or if it is the conclusion of at least one acceptable argument. D-BAS arguments are acceptable if and only if all premise statements are acceptable and if additionally the negation of the conclusion and the negation of the argument itself are not acceptable. Finally, the ASPIC⁺ export directly encodes D-BAS statements as ASPIC⁺ literals and D-BAS arguments as ASPIC⁺ inference rules, while allowing to assume D-BAS statements from a single user opinion and/or all D-BAS statements a priori, where the relative strength of these assumptions is encoded using the ASPIC⁺ preferences. Export formats are targeting state-of-the-art solvers for the respective model:

- AF export uses ASPARTIX syntax [8] which is compatible with most AF solvers,
- ADF export uses the input format of the YADF [9] and DIAMOND [10] solvers,
- ASPIC⁺ export format is tailored to the TOAST [11] online ASPIC⁺ solver.

DABASCO is available on GitHub at <https://github.com/hhucn/dabasco>. Python 3 is required to run the DABASCO service. DABASCO queries anonymized discussion data directly from a local D-BAS installation using D-BAS' REST API and serves the translated data in JSON format on its own REST API. A full guide for setup, configuration and use of DABASCO is included in the repository. It also includes a small mockup app that imitates D-BAS' API and serves example discussion data, which allows to test DABASCO's features without the need to run a full D-BAS installation. DABASCO is published under the MIT license—you are free to use, distribute and modify it.

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