AdmBuster: a benchmark example for (strong) admissibility

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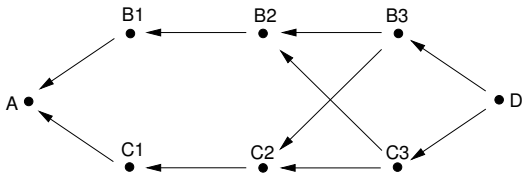
The *admbuster* example (as illustrated on the right) has been taken from [1]. The idea is that there is a set of arguments $\{A\} \cup \{B_1, \ldots, B_n\} \cup \{C_1, \ldots, C_n\} \cup \{D\}$ where n is a positive odd integer. B_1 and C_1 attack A. D attacks B_n and C_n. Each even B_i attacks B_{i-1}. Each even C_i attacks C_{i-1}. Each odd B_i and C_i ($i > 1$) attacks both B_{i-1} and C_{i-1}.



The admbuster example has just a single complete labelling, which labels A, D and every even B_i and C_i `in`, and every odd B_i and C_i `out`. Surprisingly, several dialectic proof procedures for credulous preferred and grounded semantics perform really bad when being asked whether A is in an admissible or strongly admissible set.[1] This is especially true when these are based on the concept of dialectical trees, which fan out at each even B_i and C_i, leading to a lot of duplicate computation (see [1] for details). More efficient dialectical proof procedures (which deliberately avoid the use of dialectical trees) have recently been invented [2]. Hence, the value of the admbuster example is that it allows us to distinguish between efficient proof procedures and less efficient proof procedures when it comes to determining the status of a particular argument (see [3] for details).

Relevant solver questions: (1) is argument A in at least one preferred extension (answer: yes) and (2) is argument A in the grounded extension (answer: yes).

References

[1] M.W.A. Caminada. Strong admissibility revisited. In Simon Parsons, Nir Oren, Chris Reed, and Frederico Cerutti, editors, *Computational Models of Argument; Proceedings of COMMA 2014*, pages 197–208. IOS Press, 2014.

[2] M.W.A. Caminada. A discussion game for grounded semantics. In Elizabeth Black, Sanjay Modgil, and Nir Oren, editors, *Theory and Applications of Formal Argumentation (proceedings TAFA 2015)*, pages 59–73. Springer, 2015.

[3] M.W.A. Caminada. Argumentation semantics as formal discussion. In *Handbook of Formal Argumentation*. 2017. in preparation.

[1]Recall that an argument is in at least one preferred extension iff it is in at least one admissible set, and an argument is in the grounded extension iff it is in at least one strongly admissible set [1].