

# The Fourth International Competition on Computational Models of Argumentation

Call for Solvers

<http://argumentationcompetition.org/2021/index.html>

Argumentation is a major topic in the study of Artificial Intelligence. In particular, the problem of solving certain reasoning tasks on Dung’s abstract argumentation frameworks or in (logic-based) structured argumentation frameworks is central to many advanced argumentation systems. The fact that many of the problems to be solved are intractable requires efficient algorithms and solvers.

The main goals of the competition are to provide a forum for empirical comparison of solvers, to highlight challenges to the community, to propose new directions for research, and to provide a core of common benchmark instances and a representation formalism that can aid in the comparison and evaluation of solvers.

After the success of ICCMA’15, ICCMA’17 and ICCMA’19 (<http://argumentationcompetition.org>), the Fourth International Competition on Computational Models of Argumentation (ICCMA’21) will be conducted in the first half of 2021. ICCMA’21 will include reasoning tasks in abstract argumentation frameworks as well as (for the first time at ICCMA) structured argumentation (namely, Assumption-based Argumentation). Submitted solvers will be tested on a selected collection of benchmark instances (see Call for Benchmarks: <http://argumentationcompetition.org/2021/calls.html>).

Solvers will be evaluated based on their performance in solving the following problems:

- (SE) Given an abstract argumentation framework, determine some extension;
- (CE) Given an abstract argumentation framework, determine the number of its extensions;
- (DC) Given an abstract argumentation framework and some argument, decide whether the given argument is credulously inferred;
- (DS) Given an abstract argumentation framework and some argument, decide whether the given argument is skeptically inferred.

The above computational problems are to be solved with respect to the following standard semantics:

- (CO) Complete Semantics (SE, EE, DC, DS);
- (PR) Preferred Semantics (SE, EE, DC, DS);
- (ST) Stable Semantics (SE, EE, DC, DS);
- (SST) Semi-stable Semantics (SE, EE, DC, DS);
- (STG) Stage Semantics (SE, EE, DC, DS);
- (ID) Ideal Semantics (only (SE) and (DS)).

A task is a problem under a semantics. All the tasks of a particular semantics constitute a single different sub-track. For single-status semantics (ID) only the problems SE and DS are considered (CE is trivial, and DC is equivalent to DS). Note that DC-CO and DC-PR are equivalent as well, but in order to allow the participation in the preferred track without implementing tasks on the complete semantics (or viceversa), we repeat the task.

These six sub-tracks form a first track, dedicated static abstract argumentation.

In addition, the track dedicated to dynamic abstract argumentation is made of three sub-tracks. This track is dedicated to the solution of problems over dynamic argumentation frameworks. In this case, a benchmark consists of an initial framework and an additional file storing a sequence of additions/deletions of attacks/arguments. This file will be provided through a simple text format, e.g., a sequence of “+att(a,b).” or “-att(d,e).”. The final output needs to report the solution for the initial framework and as many outputs as the number of changes. The three sub-tracks involve the following semantics, for the four problems (SE,CE,DC,DS).

**(CO-D)** Complete Semantics, where D stands for ”dynamic”;

**(PR-D)** Preferred Semantics;

**(ST-D)** Stable Semantics.

Besides the file with changes, we will also provide all the full frameworks (one for each change), in order to allow non-dynamic solvers to participate to these tracks as well. More info available at <http://argumentationcompetition.org/2021/SolverRequirements.pdf>.

ICCMA’21 also introduces two completely new kinds of tracks. The first one is dedicated to approximate algorithms. It also concerns abstract argumentation, and focuses on the problems (DS) and (DC) for the semantics (CO,PR,ST,SST,STG) and DS for ID. And finally, a new track for structured argumentation is made of three sub-tracks, corresponding to the problems (SE,CE,DC,DS) for the semantics (CO,PR,ST) of assumption-based argumentation frameworks.

Developers of solvers may decide to only provide support for a subset of the above (sub-)tracks (for a maximum of eleven tracks). For each (sub-)track we will provide a ranking of the performance of the submitted solvers. Awards go to the winners of (sub-)tracks. Detailed evaluation and ranking rules can be found at <http://argumentationcompetition.org/2021/rules.html>.

Input and output format are adapted from the last edition and detailed at <http://argumentationcompetition.org/2021/SolverRequirements.pdf>.

The evaluation process will consist of two phases: after the registration phase, the competitors will be given a set of representative frameworks to test their solvers on their own machines. Then, authors will be allowed to submit the source code or binary file of their solver.

## Registration

The competitors first need to declare (by email, [iccma2021@criil.fr](mailto:iccma2021@criil.fr)) their interest to submit their solver and participate to the competition (by February 15, 2021). Registered competitors will receive a sample of the frameworks on which their solver will be tested (by the beginning of March).

## Final Submission

Solvers must be submitted as a ZIP archive containing their source code and a build.sh shell script producing the solver binary from the source code (if needed). A README file must be present, explaining the material required by the solver (e.g. libraries), how to launch it against a problem, and other information that may be useful to build/execute your solver. The experiments are intended to be held on machines equipped with Intel Xeon E5-2637 v4 CPUs and 128GB of RAM. These machines are operated by 64bits CentOS Linux release 7.3.1611 (Linux kernel version 3.10).

In order to confirm their participation, the competitors need to submit as well a solver description (2-4 pages). The Latex template is available at <http://argumentationcompetition.org/2021/iccma2021-latex-template.tar.gz>.

This paper also has to indicate the name and affiliations of each team member, the name of the solver, and the classical/dynamic tasks that the solver will be able to handle (a complete list can be found at <http://>

[//argumentationcompetition.org/2021/SolverRequirements.pdf](http://argumentationcompetition.org/2021/SolverRequirements.pdf)), the system architecture, which features or functions the system provides, what design choices were made and what lessons were learned. In addition, the paper has to mandatorily report a link to the source code or binary file of the solver.

Both the paper and the solver must be submitted on <http://iccma2021.cril.fr/>.

After the announcement of the results, we expect the authors of solvers to submit their solver description on arXiv. This will allow us to gather these papers (as well as the benchmarks descriptions) as ICCMA 2021 proceedings. More instructions will be provided at this moment.

## Schedule

The schedule of the competition activities is:

- Feb 15, 2021: Declaration of intent by participants
- Feb 15, 2021: Benchmark submission
- Mar 30, 2021: Solver submission
- Apr 15, 2021: System descriptions
- Aug, 2021: Presentation of results

## Contact

- Main contact: [iccma2021@cril.fr](mailto:iccma2021@cril.fr)
- Submission website: <http://iccma2021.cril.fr/>
- For up-to-date information: <https://twitter.com/argcompetition>
- Participants or just interested people are welcome to subscribe to [argumentationcompetition@inria.fr](mailto:argumentationcompetition@inria.fr), by sending an email with header “`subscribe argumentationcompetition <your first name> <your surname>`” to [sympa\\_inria@inria.fr](mailto:sympa_inria@inria.fr), in order to receive information concerning future editions of ICCMA.

## Organizers

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