

Scheduling a Scheduling Competition

<http://pst.istc.cnr.it/ssc-at-icaps-07>

To be held in conjunction with the
17th International Conference on Automated Planning & Scheduling
(ICAPS '07)

September 22nd – 26th 2007, Providence, Rhode Island, USA

Overview

Scheduling is a capability central to a large and diverse range of practical applications and has been a core subject of research for many years. Research in automated scheduling has produced a large number of solution techniques and support tools, many of which have had a major impact on productivity and cost-effectiveness of operations in specific applications. One broad reason for differences in solution approaches has been differences in the various application contexts that have inspired scheduling research. The particular characteristics of different classes of application problems have naturally biased researchers towards particular solution techniques. Another reason is the fact that scheduling research is fragmented across different research communities. Research within the respective disciplines of AI and OR has given rise to different classes of solution approaches, rooted in different core technologies such as constraint reasoning, mathematical programming or heuristic search. This workshop attempts to understand if and how it is possible to compare such different approaches in a common competition, to be held regularly at the ICAPS venue.

Why now? Many fields have benefited from the organization of a competition. The international competitions in planning (IPC), SAT and QBF, knowledge engineering for planning and scheduling (ICKEPS), as well as more distant domains such as robotics (RoboCup) have fostered measurable advancements in their respective fields. Whether this will be the case in scheduling remains to be seen, although it is likely that a competitive approach to evaluation in a field as fragmented as scheduling could greatly foster cross-fertilization and synergy among researchers with different backgrounds. In addition to the generic benefits a competition can bring to the scientific community, the event can also help to further bridge the gap between theory and practice in scheduling by introducing benchmarks that are grounded in application problems posed by industry. The feasibility of this applications focus stems from the already strong bias in some areas of scheduling towards industrial problems. Given the heterogeneous nature of scheduling, the premises for a successful competition need to be discussed

and agreed upon by a critical mass of researchers in these distinct fields. Specifically, the aim of the discussion is to:

- collectively discuss the prospect of a scheduling competition in terms of its potential benefits to the research community on one hand, and to industry on the other;
- assess the feasibility of a common evaluation framework for different scheduling approaches;
- identify common features of problems and algorithms which derive from traditionally different scheduling contexts.

ICAPS is by nature open to different approaches for automated planning and scheduling. Although the technical track of the conference has predominantly focused on AI approaches, we believe that a regular scheduling competition can contribute to broadening the scope of ICAPS to include approaches that have received less attention in the past.

Topics of Interest

This workshop will strive to establish the feasibility as well as the key issues concerning the establishment of a scheduling competition at the ICAPS venue. We invite contributions and encourage discussion on topics related to the theoretical, organizational and practical challenges entailed by a scheduling competition. These include, but are not limited to, the following.

- Classification of scheduling problems, categorization of scheduling algorithms, and proposals for tracks.
- Metrics and benchmarks for evaluating scheduling techniques.
- Domains/problems suited for competition evaluation.
- Knowledge representation for scheduling and the need (or not) for a common reference problem formalism.
- Computational aspects of benchmarking for scheduling.
- Lessons learned and ideas from other competitions (e.g., IPC, SAT, QBF and ICKEPS competitions).

Format

The workshop is oriented towards accepting papers that offer concrete proposals for realizing the scheduling competition or address topics directly relevant to this goal. The workshop will be structured to allow ample time for discussion and interaction. The workshop will last one full day, with an agenda including the following:

- An invited talk from a senior member of the scheduling community, intended to give a cross-area perspective on competition criteria.
- Selected papers accepted by the program committee will be presented in short sessions (2-3 papers) on a common theme.
- To foster interaction and comparisons, a member of the PC will be assigned to each theme and provide a brief commentary at the end of the workshop on the collection of contributions pertaining to that theme.

Submission Information

We welcome original papers that bring forth and motivate proposals for the operational implementation of the competition, including but not limited to the topics listed above. We particularly welcome papers which provide a cross-disciplinary perspective. Participants are requested to submit one of the following:

- *Full Paper* — Technical papers addressing one or more of the workshop topics indicated above. Full papers can be up to 8 pages in length.
- *Position Paper* — Shorter papers which bring forth strong but not yet fully developed ideas related to the topics above. Position papers can be up to 4 pages in length.
- *Statement of Interest* — Although first preference will be given to full and position paper submissions, we anticipate room for a restricted number of additional attendees and request that these individuals contribute with a one-page statement of interest.

The first page of all papers should include the title, a brief abstract, and author names, affiliations, postal addresses, electronic mail addresses, and telephone and fax numbers.

Accepted full papers will appear in the workshop proceedings. One desired outcome of the workshop is to produce a special issue of a major journal regarding the fundamental issues related to implementing a scheduling competition. Authors of accepted papers will be invited to submit expanded versions of their workshop papers for consideration in this special issue.

Authors are encouraged to submit papers electronically in postscript or PDF format. Papers should be formatted using the AAAl style (see ICAPS '07 conference call).

Please send your submissions by email to

ssc07@istc.cnr.it

no later than **June 15th, 2007** using the subject line *SSC-07 Workshop Submission*.

Confidentiality of submissions will be maintained during the review process. All submitted materials for rejected papers will be kept confidential in perpetuity. All submitted materials for accepted papers will be kept confidential until the date of the workshop, September 22nd, 2007. Submissions should not include information that will be confidential or proprietary at the time of publication.

Important Dates

The schedule of important dates for the workshop is as follows:

Paper submission deadline	June 15 th , 2007
Notification of acceptance	July 13 th , 2007
Camera-ready version deadline	July 27 th , 2007
Workshop date	Sept. 22 nd , 2007

Organization

Workshop Chairs

- Federico Pecora (ISTC-CNR)
- Nicola Policella (ESA, European Space Agency)

Programme Committee

- Roman Bartak (Charles University)
- Chris Beck (University of Toronto)
- Peter Brucker (Universität Osnabrück)
- Amedeo Cesta (ISTC-CNR)
- Erik Demeulemeester (K.U. Leuven)
- Enrico Giunchiglia (Università of Genova)
- Claude Le Pape (ILOG S.A.)
- Sanja Petrovic (University of Nottingham)
- David E. Smith (NASA Ames Research Center)
- Stephen F. Smith (Carnegie Mellon University)
- Pascal van Hentenryck (Brown University)

