

Paper Submissions for COMSOC-2023

Omer Lev and Marcus Pivato

Earlier versions by Umberto Grandi, Jeffrey S. Rosenschein, Ariel Procaccia, Toby Walsh, Vincent Conitzer, Jörg Rothe, Ulle Endriss, Paul Goldberg, Jérôme Lang, Felix Brandt, Piotr Faliszewski, Lirong Xia, Edith Elkind, Reshef Meir and William S. Zwicker.

Abstract

This short paper explains the formatting instructions for submissions to the Ninth International Workshop on Computational Social Choice.

1 Formatting Instructions

Authors are invited to submit full papers not exceeding 12 pages, *excluding* references, acknowledgments, contact details, and a clearly-marked appendix of arbitrary length that will be read at the discretion of the PC members. Each paper should include a title, the names and contact details of all authors, and an abstract of 100–300 words.

Please format your paper according to the following guidelines. The most important requirements are:

1. The submission should be formatted for A4 paper (that is, the page size as shown under *Document Properties* in the Acrobat Reader, for instance, should be 210×297 cm [8.27×11.69 in]).
2. The text should fit into an area of 14×21.6 cm (5.5×8.5 in). This excludes page numbers (which we suggest you include for the submission, but which must be removed for the camera-ready version in case of acceptance).

Please use a 10pt typeface, with suitable deviations for section headings, footnotes, etc. In general, please aim at having your paper look as close to this sample as possible. The easiest way of achieving this is to use the L^AT_EX document preparation system with the style file `comsoc2023.cls` provided at the workshop website (take the file `comsoc2023.tex` as a starting point).

As in previous COMSOCs, citation style is numerical (e.g., [1]), but as of this year, it can also be made textual, when integrated into a paragraph (e.g., “as Rothe [9] wrote...”).

Papers not conforming to these guidelines will be accepted for review (provided they are not excessively long), but in case of acceptance we must insist that the guidelines be followed during preparation of the camera-ready version.

2 What is Computational Social Choice?

Computational social choice [1, 9, 8, 2] is an interdisciplinary field of study at the interface of social choice theory and computer science, promoting an exchange of ideas in both directions. On the one hand, it is concerned with the application of techniques developed in computer science, such as complexity analysis or algorithm design, to the study of social choice mechanisms, such as voting procedures or fair division algorithms. On the other hand, computational social choice is concerned with importing concepts from social choice theory into computing. For instance, social welfare orderings originally developed to analyze

the quality of resource allocations in human society are equally well applicable to problems in multiagent systems or network design.

Social choice theory is concerned with the design and analysis of methods for collective decision making. Examples include in particular voting protocols, but also procedures for fairly dividing a number of goods between several agents. Much classical work in the field has concentrated on establishing abstract results regarding the existence (or otherwise) of procedures meeting certain requirements, but such work has not usually taken computational issues into account. For instance, classical results in voting theory show that, under some weak and very natural conditions, it is impossible to design a voting protocol that voters cannot manipulate by reporting insincere preferences when casting their ballots. A voting system that induces such insincere voting behaviour cannot be expected to reliably return the socially most preferable candidate as a winner.

In recent years, computer scientists have started to analyse this kind of problem from a computational point of view [5, 6, 4]. The basic idea is that, should it be the case that manipulating successfully is a computationally intractable problem, then manipulability may be less of a worry. Other applications of preference aggregation and collective decision making include multiagent resource allocation, auctions, and prediction markets, where strategic behaviour is again analysed both game-theoretically and from a computational perspective [7].

Another example for the application of tools typically used in computer science to problems stemming from economics and social choice is the use of logic for the formal specification and verification, or more generally analysis, of social procedures. In the same way as computer scientists have long been using logic to formally specify the behaviour of computer systems, so as to allow for the automatic verification of certain desirable properties of such systems, suitable logics may be used to specify social procedures such as voting protocols or fair division algorithms. This line of research is also known as “social software”.

Known methods for collective decision making and classical results from social choice theory may not always be applicable when the number of alternatives from which to choose is large. This may, for instance, be the case when these alternatives have a combinatorial structure, as in negotiation over indivisible goods (where the number of bundles an agent may obtain is exponential in the number of goods) or committee elections (where the number of possible committees is exponential in the number of seats to be filled). For such combinatorial problems, the mere representation of the preferences of individuals over different alternatives becomes a non-trivial problem. A third example for work in computational social choice is then the application of techniques developed in artificial intelligence and logic for the compact representation of preferences to this kind of problem.

Recent research accounts on these questions and other advanced topics in computational social choice are reported in Endriss [3]. Much of this work had been first presented at previous COMSOC workshops.

References

- [1] Felix Brandt, Vincent Conitzer, Ulle Endriss, Jérôme Lang, and Ariel D. Procaccia, editors. *Handbook of Computational Social Choice*. Cambridge University Press, March 2016.
- [2] Yann Chevaleyre, Ulle Endriss, Jérôme Lang, and Nicolas Maudet. A short introduction to computational social choice. In *Proceedings of the 33rd Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM)*, volume 4362 of *Lecture Notes in Computer Science*, pages 51–69, Harrachov, Czech Republic, January 2007.

- [3] Ulle Endriss, editor. *Trends in Computational Social Choice*. AI Access, 2017.
- [4] Piotr Faliszewski and Ariel D. Procaccia. Ai’s war on manipulation: Are we winning? *AI Magazine*, 31(4):52–64, 2010.
- [5] Piotr Faliszewski, Edith Hemaspaandra, Lane A. Hemaspaandra, and Jörg Rothe. A richer understanding of the complexity of election systems. In S. S. Ravi and Sandeep K. Shukla, editors, *Fundamental Problems in Computing: Essays in Honor of Professor Daniel J. Rosenkrantz*, pages 375–406. Springer, 2009.
- [6] Piotr Faliszewski, Edith Hemaspaandra, and Lane A. Hemaspaandra. Using complexity to protect elections. *Communications of the ACM*, 53(11):74–82, November 2010.
- [7] Reshef Meir. *Strategic Voting*. Synthesis Lectures on Artificial Intelligence and Machine Learning. Morgan and Claypool, 2018.
- [8] Ariel D. Procaccia. Computational social choice: the first four centuries. *XRDS: Cross-roads, The ACM Magazine for Students*, 18(2):31–34, 2011.
- [9] Jörg Rothe, editor. *Economics and Computation*. Springer, 2015.

Omer Lev
 Ben-Gurion University of the Negev
 Beersheba, Israel
 Email: omerlev@bgu.ac.il

Marcus Pivato
 CY Cergy Paris Université
 Cergy, France
 Email: marcus.pivato@cyu.fr