Organising a Successful AI Online Conference: 
Lessons from SoCS 2020

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Abstract

The 13th Symposium on Combinatorial Search (SoCS) was held May 26–28, 2020. Originally scheduled to take place in Vienna, Austria, the symposium pivoted toward a fully online technical program in early March. As an in-person event SoCS offers participants a diverse array of scholarly activities including technical talks (long and short), poster sessions, plenary sessions, a community meeting and, new for 2020, a Master Class tutorial program. This paper describes challenges, approaches and opportunities associated with adapting these many different activities to the online setting. We consider issues such as scheduling, dissemination, attendee interaction and community engagement before, during and after the event. We report on the approaches taken by SoCS in each case, we give a post-hoc analysis of their effectiveness and we discuss how these decisions continue to impact the SoCS community in the days after SoCS 2020. This work will be of interest to organisers of similar conferences who may be considering the switch to an online format.

1 Introduction

The Symposium on Combinatorial Search (SoCS) is an annual meeting of AI researchers with an interest in the theory and practice of symbolic state-space search. Now in its 13th edition, SoCS 2020 took place entirely online during May 26-28. The decision to hold SoCS as a virtual conference was late-breaking and taken in response to the global COVID-19 pandemic. It is a major departure, not only for the SoCS series of symposia but also for the broader AI community, which values physical meetings as the primary method for disseminating new scientific results. On account of its early timing, SoCS-20 was regarded by some in the community as an experiment, ahead of other larger AI meetings that previously announced postponements but which did not yet commit to any specific format (e.g. CP, ICAPS, and IJCAI).

In this paper we report results from the SoCS 2020 experiment, widely regarded amongst participants and in the community as a success. We describe
the organisation of the symposium and our decision-making process as regards
different aspects of the technical program. We were guided in this process by
two important considerations: (i) how to cater to the truly international com-
miunity of SoCS attendees and; (ii) how to maintain the “SoCS community
spirit” where attendees spend several days at a secluded location, working and
socialising together at every opportunity.

Beyond its immediate success, we also discuss how the now proven online
format adopted for SoCS 2020 is helping to shape the future of the community.
These issues include the need for broader digital footprint to help anchor and
grow the community online and the possibility for remote as well as physical
participation during future editions of the symposium.

2 Background

In the field of Artificial Intelligence, and in Computer Science more generally,
research moves extremely fast. Progress is driven by a combination of extreme
interest on the one hand and broad applicability on the other hand. For this
reason conference proceedings are primary method of scientific communication.
These areas are in contrast to other research disciplines, such as Mathematics,
Science and the Humanities, where journal publication remains the preferred
method of dissemination.

Since 2008 the Symposium on Combinatorial Search (SoCS) brings together
a diverse array of 50-60 AI researchers working on symbolic state-space search.
The latest results from this area appear in the SoCS technical program and
are preserved for future reference in archival proceedings. Differentiating SoCS
from other similar events is the fact that each year the meeting takes place in
a semi-remote “retreat” location which fosters long periods of focused group
discussion. Because of its smaller size, SoCS is usually planned to occur just
before or just after another AI meeting. For the 2020 edition, SoCS was or-
ganised as a co-located event with the 17th International Conference on the
Integration of Constraint Programming, Artificial Intelligence and Operations
Research (CPAIOR). Both CPAIOR and SoCS were intended as physical meet-
ing in Vienna, Austria, with limited overlap to encourage cross-fertilisation.

With the rise of the COVID-19 global pandemic both SoCS and CPAIOR
had to pivot. The preferred option for SoCS was to retain the originally an-
nounced dates (May 26-28) and to migrate the entire technical program to
an online setting. SoCS-20 was not the first conference to grapple with these
challenges. AAMAS-20, a related but substantially larger sister event, also piv-
oted in towards fully online and took place May 9-13, immediately preceding
SoCS-20. Other recent events include (but are not limited to): the Interna-
tional Conference on Performance Engineering (ICPE-20, April 20-24) [8], the
International Conference on Extending Database Technology (EDBT, 30 March
- 2 April) [2], Neuromatch (March 30-31, 2020) [1] and the Photonics Online
Meetup (POM-20, January 13, 2020) [9].
3 Decisions to take

The originally announced format for SoCS 2020 featured a diverse number of activities: paper talks (short and long), invited plenaries, poster sessions, a series of Master Classes (i.e. tutorials) and a community meeting. In this section we discuss the main considerations and decisions taken in order to transfer this technical program to a fully online setting.

3.1 Format for Technical Talks

One of the pivotal aspects to consider when organising a conference is how talks will be delivered. In an online setting, talks can be delivered either live, using tools for online meetings such as Zoom, Google Meet, or Microsoft Teams, or under the form of pre-recorded videos. Both approaches have of course advantages and disadvantages, that we considered for SoCS 2020 and can be summarised as follows.

Live talks. Similar to an in-person meeting in terms of organisation and interaction, the live talk format is well understood by speakers and organisers. It has the least overhead in terms of setup costs (choosing a platform, scheduling a time) and it allows speakers to work on the slides up to the time of their talk. One of the main disadvantages is scheduling: speakers must be available at fixed times and in a suitable environment for presenting. Another disadvantage is that the quality of the presentation depends on the quality of the network connection, not only for the speaker but also for participants. It has been documented, for example, that during the COVID-19 lock-down period Internet usage dramatically increases [4] which affects quality and reliability of individual connections.

Pre-recorded talks. In this format speakers record and submit their talk well in advance. The quality of the content is carefully controlled by the speaker and the quality of the delivery is guaranteed once the video is shared and downloaded. The main disadvantage of this format is an increased workload for organisers. Detailed instructions have to be provided for speakers before the event. Submitted videos must then checked (for video and audio quality, for adherence to time limits) and possibly post-processed, such as into a streaming session. The timing and release of videos is another area that requires careful consideration so that each talk can receive the attention of the community.

Impact on Q&A. The format of talks strongly influences the type of interactions possible between speakers and participants. Live talks must be carefully managed and questions can only be taken at the end. Depending on the timing of the speaker, and the constraints of the schedule, discussion can even be cut short so that the next presentation can begin. By comparison, pre-recorded talks have the advantage that discussion can take place during the premiere time of each video, which gives participants and speakers more time to interact.
For SoCS 2020 we carefully considered the pros and cons of each format and opted for pre-recorded talks. A few days after the acceptance notification, authors were provided with detailed instructions for recording their talks, using tools such as Screencast-o-matic, Kazam Screencaster and OBS Studio. We requested each talk begin with a title card showing photos of the speaker and possibly the authors. For keeping the talks engaging, we recommended strategies such as colourful slides and animations and using a picture-in-picture view to show the presenter alongside the content. We required authors to submit their videos three weeks before the conference. This allowed for some delays in the process (to be expected, given the exceptional circumstances) and enough time for us, the organisers, to check videos and prepare them. For Q&A, we used a combination of synchronous live chat and an asynchronous discussion forum (see Section 3.5).

3.2 Posters

Each year SoCS receives a substantial number of extended abstracts which are presented during a poster session. These sessions provide participants an opportunity to browse a large number of works and to have longer 1-1 discussions. There is no clear online equivalent for these types of interactions. Recent online conferences such as EDBT-20 [2] suggest converting poster sessions into short talks, organised into a dedicated session without Q&A. At POM-20 [9] posters were presented as a deck of 4 slides, each announced and discussed on Twitter.

For SoCS-20, we developed a specific “Micro Talk” format for poster presentations. Each talk was limited to 5 minutes and a maximum of 3 slides (not including title card). These talks were mixed into regular sessions. During and immediately after the premiere of each Micro Talk there was a live Q&A with opportunities for asynchronous forum discussion thereafter.

3.3 Attendance and Registration

Online conferences have many benefits compared to in-person meetings and they are well positioned for attracting a wider audience. For participants, travel costs are eliminated, registration costs are reduced and substantial amounts of time are saved. For organisers, online conferences are simpler to plan and less expensive: many aspects such as catering, rooms, receptions, badges, welcome packs, etc. are avoided. Another benefit, for attendees and organisers, is reducing the environmental impact compared to conventional meetings [5]. Some new complications arise, such as hosting fees and licences, but these overheads tend to be significantly smaller than those for an in-person meeting. The costs can be recovered by asking attendees to pay a registration fee for online attendance however this can act as a barrier to wider participation.

For SoCS 2020 we decided to charge a registration fee only to one author per accepted paper, which covers the cost of the proceedings. Beyond that
participation was free for everyone. We asked authors, speakers, and interested participants to register for the SoCS forum, a dedicated bulletin board which we used as a channel for communication and further announcements. The talks of the authors were free to watch, even anonymously, being streamed directly to YouTube at fixed premiere times. Following their initial release, videos became freely available for viewing on-demand and we plan that they remain so in the foreseeable future.

3.4 Scheduling and Program

While the scheduling and the organisation of a conference program is always a critical task, it becomes particularly challenging for online events. In the case of pre-recorded videos, one tempting option could be to release all talks at the same time. Indeed this option was explored at AAMAS 2020, with only live keynotes and plenaries being scheduled at fixed times.

In the case of SoCS, we felt that releasing all videos simultaneously would undermine the spirit of the conference, which intends to bring together a tightly knit community for focused interaction. Instead, we opted for a conventional (to AI conferences) format, with talks being organised thematically into sessions. Each session ran for approximately 60-90 minutes and was scheduled for release on YouTube using the Premiere feature. In this setup videos are played one after the other at fixed times, with some minutes of intermission in between. We found that sessions draw larger audiences, which means each talk has a chance to be in the spotlight. Also that sessions encourage the community to gather at fixed times, which results in more vibrant Q&A with speakers and more robust interactions among participants. We scheduled 5-minutes breaks between talks in each session. These breaks signal the end of the live Q&A session (which begins while the video plays) and they provide a well-delimited time window for the community to re-synchronise. Longer breaks, between sessions, simulate the lunchtimes and coffee breaks of a conventional meeting. They allow for longer discussions and for social gatherings. We observed that many participants at SoCS-20 formed social circles during longer breaks, and many participants met virtually in the evenings, after the end of the daily program.

This type of fixed scheduling requires one to select a reference time zone. However, attendees significantly out-of-sync with the reference time-zone will likely be unable to join for synchronous interaction. After careful consideration we opted for Central European Time (CET). This was done for a number of reasons: first, because the in-person conference was supposed to happen in Austria; second, because Europe is the region where the largest number of community members live; third, because CET provides a middle ground between people living in the Americas, and people living in Asia and Australia. To minimise the discomfort for them, where possible, talks involving authors from Asia and Australia were scheduled in the morning, while talks involving authors from Americas where scheduled in the late afternoon.

Links to the session videos and individual talks appear on the SoCS-20 website: [http://socs20.search-conference.org/main.php?page=program](http://socs20.search-conference.org/main.php?page=program)
3.5 Interaction between Participants

A major aspect of any AI conference is the interaction between participants. When moving to a virtual setting it becomes crucially important to select the right tools and to leverage online advantages. At one end of the spectrum of possibilities we have asynchronous interaction. This method of communication is typified by email correspondence and discussion forums. It does not require participants to be active at the same time and it allows for more elaborate and articulated exchanges. At the other end of the spectrum is synchronous interaction. This approach captures the spirit of face to face discussion: it is fast moving and requires participants to be online at the same time. For SoCS 2020, we decided to support both types of interaction.

For asynchronous interaction we used a dedicated forum. We created discussion threads for each keynote and session. We also posted announcements to the forum and we used it to provide instructions and information ahead of the symposium, such as advice for recording videos and instructions for participating. The forum was free, but registration was required to minimise the risk of trolls [3]. Trolls represent a critical risk for free online events, as they can disrupt any meaningful interaction and communication.

Synchronous interaction was achieved using the Discord platform. Discord supports video calls, voice chat, and text chat. Instructions on how to access the dedicated SoCS Discord channel, and how to use Discord, were provided via the forum — again to reduce the possibility of trolls. Authors of accepted papers were also asked to make themselves available for live Q&A on Discord at the time when their talk was scheduled for premiere. During longer breaks, public and private group discussions sprang spontaneously, as happens during breaks at in-person conferences.

3.6 Moderation

Moderation requires significant effort for in-person AI conferences: a large number of session chairs and helpers are usually needed to make sure that, for instance, the schedule is followed, discussions do not degenerate, and that participants are behaving according to an understood code of conduct. Our experience at SoCS-20 is that moderation in virtual setting is important but much less demanding. With regards to the forum, we used only very lightweight moderation: mostly for maintaining the organisation and structure of the content. For the Discord, we found that two individuals (the organisers) were enough to moderate all the sessions. In all cases we relied on the ICAPS code of conduct to make clear the expected standard of all interactions.

Regarding Discord, we did not observe any abusive or aggressive behaviour. Instead, we were pleasantly surprised by the fact that questions were more elaborated and more “friendly” in tone might be expected at an in-person meeting.

[3] http://forum.search-conference.org/
[4] https://discord.com/
[5] http://www.icaps-conference.org/index.php/Main/CodeOfConduct
We assumed it was because with text it is hard to identify tones and that participants spent additional time to make sure their questions and their answers read well. We also noticed that conventions quickly emerged in the community: ways for “clapping” at the end of talks, for instance, and the best way to ask questions (by using the mentioning features of Discord) to make sure that they were noticed. Notably, such conventions evolved during the time of the conference, and were widely and promptly adopted by all the participants, with no enforcement from the moderators. In some cases Q&A discussions went on for too long and overlapped with the start of the next talk. In such cases we asked the involved participants to move the discussion to a dedicated chat or to the forum. This is a very nice plus of online conferences, as one group of attendees can continue to interact while others can follow sessions without being disturbed.

3.7 Keeping Records

Discussion and Q&A for in-person conferences are highly valuable aspects, as they can lead to new collaborations and highlight potential developments of the presented works. Unfortunately, they are ephemeral in nature, as it is almost impossible to keep accurate public records during an in-person meeting. This is not the case for online conferences, where textual discussions and Q&A can be easily recorded for posterity. It is of course important to decide how to structure such minutes so that they are accessible and searchable by the community at a later point in time.

For SoCS 2020 we kept track of all the discussions that happened during Q&A sessions. The forum provided the ideal platform for recording such discussions, and for structuring them. In particular, one thread per session was created to maximise clarity and to make it easier to look at them. The main point was to make sure that people that did not attend the specific session were provided with all the relevant and interesting discussion from the session. Being asynchronous, the forum allows these discussions to continue even after the conference is over, and to provide links to relevant papers, tools, or websites mentioned during the meeting.

Beside discussions, videos of the talks are another way of documenting the conference, and they can be likewise organised and stored. For SoCS 2020, we created playlists in a dedicated YouTube channel. The description of each video specifies its content, and refers to the conference forum for additional information. The complete playlist is available at [http://shorturl.at/jwIY5](http://shorturl.at/jwIY5).

4 Evaluation

To evaluate the success of SoCS 2020 we examine participation rate, which we define as the number of registered participants per accepted paper. As is typical for the field, SoCS requires at least one author per paper to register for the conference and to present the work as part of the technical program.
Table 1: Acceptance and participation rates for SoCS conferences from 2015 to 2020. The number of papers is taken by reference to published proceedings. The number of participants is taken from data collected by previous organisers (2015-2019) and by counting user registrations on the SoCS forum (2020).

| Year | Location             | Accepted Papers | Participants | Ratio |
|------|----------------------|-----------------|--------------|-------|
| 2015 | Ein Gedi (Israel)    | 44              | 65           | 1.4   |
| 2016 | Tarrytown (USA)      | 41              | 41           | 1.0   |
| 2017 | Pittsburgh (USA)     | 49              | 54           | 1.1   |
| 2018 | Stockholm (Sweden)   | 27              | 65           | 2.4   |
| 2019 | Napa (USA)           | 46              | 50           | 1.1   |
| 2020 | Online               | 27              | 140          | 5.2   |

In other words, the minimum participation rate expected in any given year is 1.0. The underlying hypothesis is that higher rates of participation indicate the technical program has attracted the attention of a broader community.

Table 1 compares SoCS 2020 with the previous five editions (2015-2019), each of which were held as in-person meetings and without any online component. The data show that, as a physical event, SoCS is typically attended only by authors of accepted works. Higher rates of participation can be observed in years where the conference is held in a location with a strong community presence (Israel, 2015) or when the conference is co-located and concurrent with major AI meetings (IJCAI, 2018). SoCS 2020 has by far the highest recorded participation rate, despite a smaller technical program. We attribute these gains to the online format and to the low cost. With free registration and no travel requirements multiple authors per paper can register for the conference. There were 140 registrations on the SoCS forum and 107 unique users subsequently logging into the SoCS Discord server for live discussions (the address of our Discord server was made available only to forum members).

Although free, user registration can act as a disincentive for persons otherwise interested in online content [7]. To mitigate this issue every session at SoCS 2020 was premiered on YouTube and made available afterwards, as detailed in Sections 3.1 and 3.4, so anyone with Internet access can enjoy them. User registration was therefore necessary only for Q&A with the speakers and for interacting with other participants from the SoCS community, as described in Sections 3.3 and 3.5.

Figures 1 and 2 show statistics gathered from YouTube regarding views and viewers. We focus on the 3 days of the conference and the week immediately after.
YouTube reports 1957 unique views over this period, approximately two thirds of which occur in the first three days. There were 469 unique viewers in total, or approximately three times higher than the number of registered participants. Moreover, with all presentations being available online and in perpetuity, there exist further opportunities for interested persons to find and engage with the technical material. Here we focus on that period of time because, in our opinion, it provides the best angle to analyse the conference success. Videos on YouTube will still be watched in the coming months, but that is a different kind of evaluation, that looks more into the impact of the topic for the wider –and potentially non-academic– community.

5 Discussion and Conclusions

SoCS 2020 received an extremely strong positive response from attendees and from the the Search community more generally. We feel confident concluding that moving the conference to a fully online format, despite some risks and uncertainties, was ultimately the right decision. The core principles of our approach can be summarised as follows:

- **Pre-recorded videos.** This approach allows speakers to carefully manage the quality of their material and delivery, while avoiding all technical issues typically associated with live presentations.

- **Streaming sessions.** This approach allows the community to meet online at times announced well in advance. Because sessions attract larger audiences, every video has an opportunity to be in the spotlight. After the session, videos are available for viewing on-demand.

- **Live Q&A.** This approach has the advantages that discussions can take place during the video premiere, instead of only at the end as with a conventional format. We found that live chat works well for a smaller
community such as SoCS but it also has the potential to scale to larger events, where moderators can relay questions to the speaker.

- **Community hub.** We used a discussion forum for asynchronous discussion where participants and speakers can engage after a video premiere. The forum also served to coordinate the conference and for keeping a record of the meeting, with live discussions being summarised there.

By the time of the community meeting, which typically concludes every SoCS event, it was clear the online format had become a proven success. Among the many issues arising at the meeting was whether future editions of SoCS should continue as online meetings or at least retain some online aspects. Among the identified advantages are higher participation rates, reduced costs, and a much smaller environmental impact \[5, 8\]. One possibility for a mixed format is to introduce a pre-recorded “micro talk” which can serve as an advertisement for a longer in-person event, but can still give an overview of the paper to people that are not able to attend the in-presence event. Another even more blended possibility is the addition of a “virtual day” which could precede the in-person meeting and include additional activities such as a Doctoral Consortium or further Master Class talks.

Other innovations from SoCS 2020 are already having an impact on the community. The discussion forum, for example, has been adopted as a general hub for the discussion of the SoCS series of symposia and for search-related topics more generally. Videos uploaded to the SoCS YouTube channel will form part of an upcoming library intended to bring students and newcomers up to the moment with research directions in the area.

References

[1] Titipat Achakulvisut, Tulakan Ruangrong, Isil Bilgin, Sofie Van Den Bossche, Brad Wyble, Dan FM Goodman, and Konrad P Kording. Point of view: Improving on legacy conferences by moving online. *Elife*, 9:e57892, 2020.

[2] Angela Bonifati, Giovanni Guerrini, Carsten Lutz, Wim Martens, Lara Mazihu, Norman Paton, Marcos Antonio Vaz Salles, Marc H Scholl, and Yonghuan Zhou. Holding a conference online and live due to covid-19. *arXiv preprint arXiv:2004.07668*, 2020.

[3] Erin E. Buckels, Paul D. Trapnell, and Delroy L. Paulhus. Trolls just want to have fun. *Personality and Individual Differences*, 67:97 – 102, 2014.

[4] Massimo Candela, Valerio Luconi, and Alessio Vecchio. Impact of the covid-19 pandemic on the internet latency: a large-scale study, 2020. *arXiv:2005.06127*.

[5] James Higham and Xavier Font. Decarbonising academia: confronting our climate hypocrisy. *Journal of Sustainable Tourism*, 28(1):1–9, 2020.
[6] Alexandru Iosup, Catia Trubiani, Anne Koziolék, José Nelson Amaral, André B Bondi, and Andreas Brunner. Flexibility is key in organizing a global professional conference online: The icpe 2020 experience in the covid-19 era. arXiv preprint arXiv:2005.09085, 2020.

[7] Ting Li and Paul A Pavlou. What drives website registration? network externalities versus information privacy concerns. Network Externalities Versus Information Privacy Concerns (September 1, 2014). Fox School of Business Research Paper, (15-053), 2014.

[8] Giulia Pacchioni. Virtual conferences get real. Nature Reviews Materials, 5(3):167–168, 2020.

[9] Orad Reshef, Igor Aharonovich, Andrea M. Armani, Sylvain Gigan, Rachel Grange, Mikhail A. Kats, and Riccardo Sapienza. How to organize an online conference. Nature Review Materials, pages 253–256, 2020.