

IWOCA 2020 IN BORDEAUX (OOPS! ON-LINE!)

31ST INTERNATIONAL WORKSHOP ON COMBINATORIAL ALGORITHMS

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Florent Foucaud Leszek Gąsieniec Ralf Klasing
Tomasz Radzik Bill Smyth

By mid-March it was becoming clear, as the global pandemic worsened, that plans could not reliably be made to hold IWOCA 2020 both in June and on site at l'Université de Bordeaux (see <https://iwoca2020.labri.fr/>).

The organizers (the first four authors of this report), in concert with the IWOCA Steering Committee¹, were faced with challenging options and little time to resolve them:

- postpone to later in the year?
- cancel, and hope for better conditions in 2021?
- plunge into *terra incognita* and go on-line?

By May Day the collective decision had been made: not only would IWOCA 2020 be “virtual”, but moreover the original dates, 8-10 June, would be retained. The quick mobilization of the local organizing committee enabled us to hold a successful meeting: we thus warmly thank all its members.² We also wish to thank the members of the program and steering committees, the speakers, session chairs, participants and our generous sponsors.

This article briefly describes our experience, which we hope may be of benefit to other on-line conference organizers in future, and also outlines the thematic scope of this meeting.

The biggest surprise was that the registered participants in our virtual IWOCA surpassed 480 — at least six times the largest number ever recorded for any one of the 30 previous IWOCAs! The registration was free of charge, and we tried to distribute the call for participation as broadly as possible not only through classic

¹ <https://nms.kcl.ac.uk/iwoca/steering.html>

² <https://iwoca2020.labri.fr/committees>

distribution lists, but also through our personal contacts, which in several cases was very successful. The *average* attendance at the on-line talks was 75–80, ranging as high as 110, both figures again much higher than any recorded in the past. The participants in IWOCA 2020 hold appointments at institutions in at least 45 different countries on six continents (Africa, Asia, Europe, North America, Oceania, South America). The represented countries were

India (64), USA (45), Greece (44), Canada (40), France (37), UK (31), Japan (30), Germany (26), Iran (13), Italy (13), Israel (11), Austria (10), Brazil (10), Netherlands (6), Poland (6), Slovenia (6), South Korea (5), Russia (5), Spain (5), Sweden (5), Switzerland (5), Bangladesh (4), China (3), Serbia (3), Belgium (2), Chile (2), Hong-Kong (2), Indonesia (2), Mexico (2), Norway (2), Armenia (1), Argentina (1), Czech republic (1), Denmark (1), Faroe Islands (1), Hungary (1), Malaysia (1), Montenegro (1), New Zealand (1), Romania (1), Singapore (1), Taiwan (1), Tunisia (1), Turkey (1), United Arab Emirates (1).

By continent, almost half (47%) came from Europe, with 30% from Asia, 22% from the Americas; there was one participant each from Africa and Oceania.

To accommodate as many time zones as possible, it was decided to have sessions from 9am to 6pm (Bordeaux time). The talks, including questions from the audience, were given live using the Zoom on-line conferencing system, and, with a little practice beforehand by speakers and session chairs, ran smoothly. The idea was to enable people to gather in real-time, which is why the talks were not pre-recorded.

Zoom was also made available for

- informal chats in the *breakout rooms*;
- the Open Problems session, chaired by Alessio Conte (Università di Pisa) and Gabriele Fici (Università di Palermo);
- the Business Meeting, where presentations were made for IWOCA 2021 (Lucia Moura, University of Ottawa) and IWOCA 2022 (Henning Fernau, Universität Trier);
- Graphmasters, a satellite meeting held one day after IWOCA 2020 (see <https://iwoca2020.labri.fr/graphmasters/>).

In addition, impromptu meetings with the speakers or specific participants could be performed via a dedicated Discord server. The Discord server was also used during the small-group discussions of Graphmasters. In order to animate the

breaks in between the talks, the moderators (organizers, session chairs) filled in the blanks by talking (e.g. with the next speaker), making announcements, etc. The idea was to make it a little bit like on a TV or radio live-show. The number of questions asked after the talks was sometimes very low. It thus seems important to find a way to encourage questions and feedback, and perhaps the moderators should prepare more for this task. We also had two photo-sessions, where we asked voluntary participants to switch on their camera, and made some screenshots. This was well-received and helped to relax the atmosphere. In retrospect, perhaps this could have been done already at the opening of the conference, as it created a more personal experience. Indeed, the main challenge in a virtual conference is to emulate the social interactions that naturally occur in a physical conference.

Springer-Verlag, for years publisher of the Proceedings, this year made them available on-line on the conference website (see above), and in addition provided 50 hardcopy versions to those who requested them. Altogether the Proceedings (LNCS 12126), published in the ARCoSS subline of LNCS, include the 30 accepted papers (out of 62 submissions) and one of the three invited papers. Awards, sponsored by Springer, were made for the best paper

- Peter Damaschke, *Two robots patrolling on a line: integer version and approximability*

and the best student papers, won jointly by

- Pratibha Choudhary, *Polynomial time algorithms for tracking path problems*
- Florent Foucaud, Benjamin Gras, Anthony Perez, Florian Sikora, *On the complexity of broadcast domination and multipacking in digraphs*

The three invited talks were

- Dan Alistarh, *Optimization by population: large-scale distributed optimization via population protocols*
- Sándor Fekete, *Coordinating swarms of objects at extreme dimensions*
- Tatiana Starikovskaya, *Algorithms for string processing in restricted-access models of computation*

Graph algorithms dominated the contributed talks this year, but there were also several papers dealing with *Dynamic and online algorithms*, and *Parameterized algorithms*, reflecting the increased interest in these topics. Of the 30 accepted papers, 9 dealt with *Graph algorithms*, 5 with *Dynamic and online algorithms*, and 5 with *Parameterized algorithms*. The 11 remaining papers covered diverse

topics from *Combinatorial algorithms*, *Graph theory*, *Graph matching*, *Matroids*, and *Distributed algorithms*.

As usual, authors of selected Proceedings papers were invited to submit significantly enhanced versions of their work to a special issue of an important journal — this year, *Algorithmica*.

IWOCA descends from the original *Australasian Workshop on Combinatorial Algorithms*, first held in 1989, then renamed *International* in 2007 in response to consistent interest and support from researchers outside the Australasian region. The workshop's permanent website can be accessed at

<http://www.iwoca.org/>

where links to all IWOCAs — past, present and future — can be found, as well as a list of Open Problems in the domain.