



IJCARS-IPCAI 2023 special issue: conference information processing for computer-assisted interventions, 14th International Conference 2023—part 1

Toby Collins¹ · Qi Dou² · Mathias Unberath³

Accepted: 19 May 2023 / Published online: 3 June 2023
© CARS 2023

We are delighted to present this special issue of the International Journal of Computer Assisted Radiology and Surgery (IJCARS), as Part 1 of the 14th International Conference on Information Processing in Computer-Assisted Interventions (IPCAI) 2023. IPCAI was held on June 20th and 21st, 2023, in conjunction with the Computer Assisted Radiology and Surgery (CARS) Congress in Munich, Germany. The research papers contained in this special issue were presented with on-site and remote audience participation.

Since 2010, IPCAI has been a premier international and interdisciplinary forum to advance the Computer Assisted Intervention (CAI) research field, by bringing together clinicians, computer scientists, engineers, and other researchers in a unique setting. From the beginning, the aim of IPCAI has been to foster active engagement of the attendees by providing session formats that allow for in-depth discussions of the topics presented. Putting strong focus on translational research at the interface between computational and engineering sciences and clinical and interventional practice, distinguishes IPCAI from other conferences in the field. Key topics include surgical data science, interventional imaging, interventional robotics, tracking and navigation, surgical planning and simulation, augmented reality and advanced visualization as well as surgical skill analysis and workflow, and clinical validation.

During the last years, two contribution formats have been considered at IPCAI: (1) regular papers, which are

full, journal-style contributions in which authors can present their research in depth, and (2) long abstracts, which are intended to showcase novel ideas, software platforms, or recent breakthroughs, including those with preliminary but limited experimental validation.

We received 95 regular paper submissions for IPCAI 2023, spanning Europe, North America Asia, and Africa. This was approximately double the amount compared to IPCAI 2022 (46 submissions). After initial quality and format checking, 6 submissions were desk rejected, and the remaining were assigned to area chairs and sent out for a rigorous peer review process. Unlike previous years, the area chairs were selected using an open call. This attracted 80 candidates from across the globe, from which 20 experts were selected. Two area chairs and at least three qualified peer reviewers were allocated to each paper in a single-blind review process. Based on the independent reviews, and consolidated reviews ('meta-reviews') provided by the area chairs, 21 submissions were accepted, 27 were rejected, 3 were withdrawn by the authors, and 38 were offered a revision, where the authors addressed the reviewer comments in a revised manuscript, which then underwent a second peer review round. Of these revised works, 26 were accepted, due to a unanimously strong second-round review, or in borderline cases, positive recommendations after careful consideration by the program chairs and a subgroup of the IPCAI steering committee. All 47 accepted IPCAI submissions, corresponding to a 49.5% acceptance rate, were transferred to IJCARS for a final review round, which typically involved only minor corrections.

We received 25 long abstract submissions for IPCAI 2023, which was approximately double the amount compared to IPCAI 2022 (12 submissions). Each submission was peer reviewed by two independent reviewers, and 15 were accepted for presentation at the conference (60% acceptance rate). The authors of each accepted long abstract were offered to publish their manuscript as a short communication paper in the IJCARS-IPCAI special issue. Accordingly, short communication manuscripts were submitted, which were then

✉ Toby Collins
toby.collins@ircad.fr

Qi Dou
qidou@cuhk.edu.hk

Mathias Unberath
unberath@jhu.edu

¹ IRCAD France & Africa, Strasbourg, France

² The Chinese University of Hong Kong, Hong Kong, China

³ Johns Hopkins University, Baltimore, MD, USA

externally peer reviewed by IJCARS, typically involving a single round of minor revisions.

In Part 1 of the IJCARS-IPCAI 2023 special issue, we present 19 regular papers of IPCAI 2023. A separate part 2 of this special issue will include most of the remaining regular papers and short communications.

Scientifically, the contributions in this special issue cover a wide range of topics with machine learning being the primary common methodological denominator. Applications range from robotics, augmented reality, and classical computer-assisted interventions over intraoperative imaging such as ultrasound and laparoscopy to surgical workflow, surgical data science, and clinical validation.

Establishing the IPCAI 2023 program has involved much work and dedication from many individuals who have generously volunteered their time. We thank all the people who applied to serve as Area Chairs, from which 20 applicants were selected. The work and communication of the Area Chairs during the paper review and selection processes were essential. The workload was especially demanding due to the much higher quantity of submissions compared to previous years. We would like to thank the 210 peer reviewers for their tremendous work to facilitate a rigorous review process that spanned up to 3 revision rounds first for IPCAI and then for

IJCARS. We also thank the 86 individuals who responded positively to our call for emergency reviewers, enabling us to maintain IPCAI's high reviewing standards. We thank the IPCAI 2023 General Chairs (Tim Salcudean, Raphael Sznitman and Nicolas Padoy) for their support and advice through the whole process and the IPCAI Steering Committee subgroup for their important feedback in the final stages of paper selection. We also thank the CARS office and IJCARS editorial office for their partnership and support at each step of the way, our industrial sponsors for their generous donations, the IPCAI 2022 PCs for transferring their knowledge to us, Nassir Navab for his support for award selection, and the 29 research faculty members who served on the award panel. Finally, we express our profound gratitude to all the authors of IPCAI 2023 whose wide-ranging scientific innovations are showcased in these special issues. We very much hope that the increased interest to submit to IPCAI will continue into the future.

Toby Collins, Qi Dou, and Mathias Unberath
IPCAI 2023 Program Chairs

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.