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# Medical Image Computing and Computer Assisted Intervention – MICCAI 2017

20th International Conference  
Quebec City, QC, Canada, September 11–13, 2017  
Proceedings, Part I

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# Preface



We are very proud to present the conference proceedings for the 20th Medical Image Computing and Computer Assisted Intervention (MICCAI) conference, which was successfully held at the Quebec City Conference Center, September 11–13, 2017 in Quebec City, Canada. Ce fut un plaisir et une fierté de vous recevoir tous et chacun à Québec, berceau de la culture francophone en Amérique du Nord<sup>1</sup>.

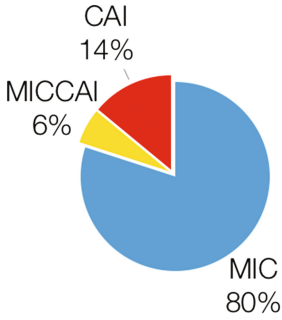
The MICCAI 2017 conference, alongside 45 satellite events held on September 10th and 14th, attracted hundreds of word-leading scientists, engineers, and clinicians, involved in medical image processing, medical image formation, and computer assisted medical procedures.

You will find assembled in this three-volume Lecture Notes in Computer Science (LNCS) publication the proceedings for the main conference, selected after a thoughtful, insightful, and diligent double-blind review process, which was organized in several phases, described below.

The preliminary phase of the review process happened before the curtain was raised, so to speak, as the Program Chairs made the decision to move MICCAI towards novel conference management tools of increasingly common use in the computer vision and machine learning community. These included the Conference Managing Toolkit for paper submissions and reviews (<https://cmt.research.microsoft.com>); the Toronto Paper Matching System (<http://torontopapermatching.org/>) for automatic paper assignment to area chairs and reviewers; and Researcher.CC (<http://researcher.cc>) to handle conflicts between authors, area chairs, and reviewers.

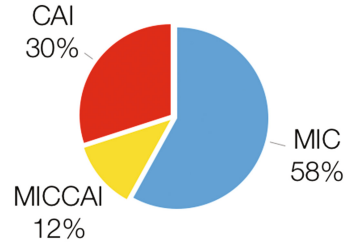
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<sup>1</sup> It was our pleasure and pride to welcome you each and all to Quebec, the cradle of French-speaking culture in North America.

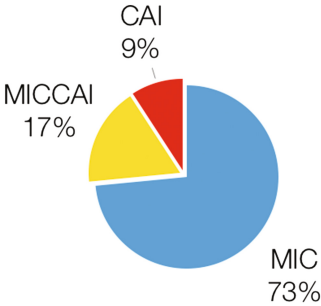


**Fig. 1.** Incoming manuscript distribution

Phase 1 of the review process of each paper was handled by an area chair and three reviewers. There was a total of 52 area chairs selected with expertise as shown in Fig. 2. Noticeably, 50% were from the Americas, 35% from Europe, and 15% from Asia, with 44% women.



**Fig. 2.** PC distribution

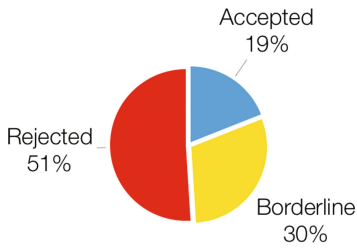


**Fig. 3.** Reviewer distribution

The first phase consisted in the management of abstracts per se. In total, 800 submissions were received, from over 1,150 intentions to submit. As seen in Fig. 1, of those submissions, 80% were considered as pure Medical Image Computing (MIC), 14% as pure Computer Assisted Intervention (CAI), and 6% as MIC-CAI papers that fitted into both MIC and CAI areas. Of note, 21% papers were submitted by a female first author.

Each area chair had 14 to 20 papers to handle. Each reviewer committed to review from 3 to 6 papers. We had a total of 627 reviewers with expertise as detailed in Fig. 3, and of which 20% were women.

To assign reviewers for each submitted manuscript, we first used the Toronto Paper Matching System to assign each paper with a ranked list of reviewers. Second, area chairs, blinded to authorship, re-ordered and ranked reviewers assigned for each paper. Finally, the Conference Management Toolkit made the final assignment of papers automatically using the Toronto Paper Matching System scores and rankings from area chairs, while balancing the workload among all reviewers.



**Fig. 4.** Phase 1 results

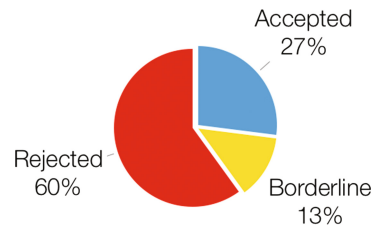
Based on the Phase 1 double-blind reviews and rebuttals sent specifically to area chairs, 152 papers were directly accepted and 405 papers were directly rejected, giving the distribution shown in Fig. 4.

Next, the remaining 243 borderline papers went into Phase 2 of the review process. The area chair first ranked the Phase 1 remaining papers and a second area chair performed a ranking of the same papers. Papers in agreement by both rankings from area chairs (ranked in top 50% or ranked in bottom 50%) were either accepted or rejected accordingly, and the remaining papers categorized as borderline of Phase 2. This process yielded 103 borderline papers, 217 accepted papers, and 471 rejected papers, as shown in Fig. 5.

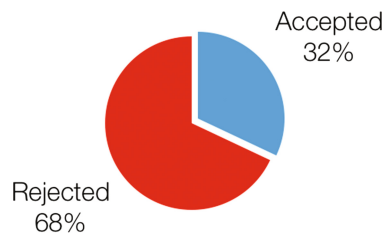
Finally, the reviews, the area chair rankings, and associated rebuttals were subsequently discussed in person among the Program Committee (PC) members during the MICCAI 2017 PC meeting that took place in Quebec City, Canada, May 10–12, 2017, with 38 out of 52 PC members in attendance. The process led to the acceptance of another 38 papers and the rejection of 65 papers. In total, 255 papers of the 800 submitted papers were accepted, for an overall acceptance rate of 32% (Fig. 6), with 45 accepted papers (18%) by a female first author (164 papers were submitted by a female first author).

For these proceedings, the 255 papers have been organized in 15 groups as follows:

- Volume LNCS 10433 includes Atlas and Surface-Based Techniques (14 manuscripts), Shape and Patch-Based Techniques (11), Registration Techniques (15), Functional Imaging, Connectivity and Brain Parcellation (17), Diffusion Magnetic Resonance Imaging (MRI) & Tensor/Fiber Processing (20), Image Segmentation and Modelling (12).
- Volume LNCS 10434 includes: Optical Imaging (18 manuscripts), Airway and Vessel Analysis (10), Motion and Cardiac Analysis (16), Tumor Processing (9), Planning and Simulation for Medical Interventions (11), Interventional Imaging and Navigation (14), and Medical Image Computing (8).
- Volume LNCS 10435 includes: Feature Extraction and Classification Techniques (23 manuscripts) and Machine Learning in Medical Imaging Computing (56).



**Fig. 5.** Phase 2 results



**Fig. 6.** Final results

In closing, we would like to thank specific individuals who contributed greatly to the success of MICCAI 2017 and the quality of its proceedings. These include the Satellite Events Committee led by Tal Arbel. Her co-chairs were Jorge Cardoso, Parvin Mousavi, Kevin Whittingstall, and Leo Grady; other members of the Organizing Committee including Mallar Chakravarty (social), Mert Sabuncu (MICCAI 2016), Julia Schnabel (MICCAI 2018), and Caroline Worreth and her team of volunteers and professionals; the MICCAI society, for support and insightful comments; and our partners for financial support and their presence on site. We are especially grateful to all members of the PC for their diligent work in helping to prepare the technical program, as well as the reviewers for their support during the entire process. Last but not least, we thank authors, co-authors, students, and supervisors, who toiled away to produce work of exceptional quality that maintains MICCAI as a beacon of *savoir-faire* and expertise not to be missed.

We look forward to seeing you in Granada, Spain – Au plaisir de vous revoir en 2018!

August 2017

Maxime Descoteaux  
Lena Maier-Hein  
Alfred Franz  
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