

Understanding and Strengthening the Computational Creativity Community: A Report From The Computational Creativity Task Force

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Abstract

The field of computational creativity is rightfully home to a great diversity of perspectives and disciplines. As members of such a diverse community we need to pay special attention to how we can sustain a common identity, and how we communicate, support, and evaluate our work. Here, we introduce the first report from the Computational Creativity Task Force, which was established to support the collective advancement of the computational creativity research community. As a first step towards that goal, we present an exploration of who we are as a community: the authors and program committee members of the International Conference on Computational Creativity. We welcome a discussion of both this data and the mission of the task force going forwards.

Introduction

Since the emergence of computational creativity (CC) as a research field, its meaning and goals have been subject to an ongoing debate. CC approaches have been applied not only in new application areas (Loughran and O’Neill, 2017) but to entirely new kinds of creativity. Far from the niche interest we may have started as, the exploration of creativity and AI is exploding around us. Complementary research is being proposed and conducted in many other communities, e.g. on “constructive machine learning” and “machine learning for creativity and design” at NeurIPS, on “diversity and serendipity” at RecSys and SIGIR, on “imagination machines” at AAAI (Mahadevan, 2018), and on “open-endedness” in ALIFE (Stanley, Lehman, and Soros, 2017). We think that the almost twenty year history of the International Conference on Computational Creativity (ICCC) and the joint workshops that preceded it (Boden, 2015) have a lot to offer these emerging disciplines. We can see ourselves and our interests in each of those areas, but do they see us?

We are, now more than ever, champions of an idea whose time has finally come. The Computational Creativity Task Force was formed by the Association for Computational Creativity (ACC)¹ with a simple question in mind: what are

¹The ACC is the body that organises the annual ICCC event as well as the affiliated Journal of Computational Creativity.

we going to do about it? Our opinion is that to participate in the growing debate will bring interest and impact to our work, while to ignore it and be comfortable in our relative isolation would be a truly unfortunate missed opportunity. We propose not that we change who we are, but how we communicate: how do we speak to these parallel disciplines, not as a way to join them but as a way to give our ideas the voice needed to influence them? How can we act as ambassadors, encouraging researchers from those adjacent communities to read our work and see its value to their own? And what can we in turn learn from these communities and embrace in our work (Cook and Colton, 2018)?

This means a re-evaluation of what we conceive as computational creativity research, and how inclusive we want it to be with respect to other areas of AI and beyond. It also means a re-evaluation of how we disseminate our work, as the responsibility of building bridges to other communities cannot solely fall on those who already have one foot on both shores. At the same time, we cannot lose sight of what makes us unique: while encouraging cross-pollination and integrating with neighbouring communities, we need to retain a focus on the questions and explorations that are not being performed elsewhere. As Don Barnes would say, we’ve got to hold on loosely, but not let go.

The Computational Creativity Task Force was founded to support the field of CC and its researchers by providing a robust pipeline for strengthening community unity and productivity. It has been initiated by Christian Guckelsberger, João Miguel Cunha, Carlos León, and Pablo Gervás, inspired by conversations with Tony Veale, Amílcar Cardoso, Hannu Toivonen, Rafael Pérez y Pérez and others. Those discussions, which took place at the 2019 Dagstuhl workshop “Computational Creativity Meets Digital Literary Studies” (Besold et al., 2019) concerned the state of the CC community and the conference: was it still relevant when similar-sounding research attracted much larger crowds elsewhere? After so long trying to get these ideas to go mainstream, were we in danger of the mainstream passing us by? Are we as researchers sufficiently equipped to push this field forward? These questions have been raised

by the community before, but with few practical outcomes.

The task force was officially formed following a presentation of the above concerns to the ACC Steering Committee at ICC'19, and announced at the community meeting that followed that event. In an effort to be most representative of CC researchers, the present members were recruited not just based on their capacity to contribute, but also their diversity in terms of gender, experience, and research focus. The authors of this paper are the task force's first members.

The task force operates independently of, but in close interaction with, the ACC steering committee: its members identify issues concerning the CC community, the ICC conference, the journal, and the other activities of the association. They then develop proposals to overcome these issues that are put to the Steering Committee as a whole. If accepted, these proposals are further refined and implemented.

We are dedicated to keeping the task force open, and welcome everyone to contribute their ideas and their time in any way that they can. A major goal of this report is to make our work more transparent, and encourage the community to participate in this endeavour.

This report summarises our tasks and their results so far. It builds on a body of work that is deeply concerned with the CC community, studying which lessons for future growth and knowledge exchange can be learned from neighbouring communities (Cook and Colton, 2018), investigating the diversity of application areas within CC research (Loughran and O'Neill, 2017), and examining how the field is perceived (Harmon and McDonough, 2019).

Goals and Tasks

The Computational Creativity Task Force was founded to foster the development of the CC field and community. However, these are abstract goals; thus, upon its foundation we identified concrete areas to address. The following goals were defined: (i) to reflect on the attractiveness of ICC as a venue for CC research and implement measures to foster openness and preserve interdisciplinarity; (ii) to assess the perception (our own, and that of others) of CC as a community and identify possible actions to improve our image; (iii) to analyse our current way of functioning, specifically regarding scientific practices, and propose changes and procedures to ensure consistent scientific quality; and (iv) to actively seek opportunities to connect with other researchers and stimulate collaboration.

With these goals in mind, we have been working on five core tasks over the past year. In the following sections, we provide a brief overview of each task.

Community Survey

To gain a better understanding of the needs and perceptions of the CC community, we developed a survey to distribute among regular and likely new conference attendees. Our objectives were to identify those who were interested in the community, to better understand their backgrounds and needs, and to hear their perceptions of CC as a field, research venue, and research community. As of this moment, more than 140 participants have completed the online question-

naire, recruited via email (using the CC mailing list²), the CC forum³, Twitter, and other social media channels. We will report on the results of this survey in future work.

Calls for Papers and Tutorials

As a conference, ICC has sought to be seen as a driving force for CC and be a central venue to discuss the developments, goals, and future of CC-related research. While much attention has been given to CC and new perspectives have appeared, our positioning has remained mostly unchanged—an example is the Call for Papers (CfP), which has had little changes in the past years.

After reviewing the existing CfP, we identified two aspects to work on: (i) the inclusion of new areas while still providing a clear indication of the scope and (ii) an adjustment to the presentation of the CfP to attract fresh perspectives and to increase a sense of openness.

We put forward suggestions for revised ICC calls for papers and tutorials that were eventually incorporated by the program chairs for the 2020 conference. Most significantly, we proposed *Computational Creativity Translations*, a new extended short paper category. This category acknowledges that research relevant to the core CC goals is presented and published at other venues without being assessed with respect to these goals. Further, it allows for such work to be re-evaluated with respect to CC research. In this way, the category has the potential to welcome and invite more members into the community, and to make important findings transparent that would otherwise have remained unnoticed. Encouragingly, a substantial portion of tentative 2020 conference attendees have indicated they were more inclined to submit to ICC as a result of this change—this is a preliminary result obtained with the community survey. Eventually, five submissions to ICC'20 were made in this category, mostly by authors who have not previously submitted to the conference.

Best Practices for Reviewing Papers

As previously mentioned, one of our goals is related to maintaining the scientific quality of the research initiatives organised by the ACC. Paper reviews contribute directly to improving the quality of CC research and reinforcing the fabric of our community. Moreover, they reward, encourage, and improve the efforts of individual researchers submitting their work, and can make them feel welcome within a research field to which they may not have previously contributed. To increase these beneficial effects, we first surveyed reviewing guidelines from related conferences and developed a set of best practices for reviewing ICC papers. These guidelines were provided to the ICC'20 reviewers and were also posted on the ICC website⁴.

²<https://mailchi.mp/b3bd32bb89e3/ccmailinglist>

³<https://groups.google.com/forum/#!forum/computational-creativity-forum>

⁴<http://computationalcreativity.net/iccc20/reviewer-best-practices/>

Code of Conduct

Professional conferences and organisations typically have a code of conduct that specifies acceptable versus unacceptable behaviour in relation to member activities, procedures for reporting harassment, and addressing grievances (e.g. Ruby Berlin e.V., 2020). In an effort to prevent such unacceptable behaviour and to highlight ICCC as a safe and inclusive space to regulars and newcomers, we have developed an initial draft of a formalised ICCC Code of Conduct to be implemented in future years. Crucially, we do not consider such guidelines a way to make pariahs out of the unreformed, but should rather remind us of the fact that we all have biases and prejudices. It is more important that we develop good guidelines rather than coming up with them fast, and work on this task is thus ongoing.

Diversity Strategy

We are dedicated to increasing the diversity and inclusiveness of the CC community and ICCC as its main conference. More specifically, we want to welcome researchers representing a wide variety of, amongst others, cultures, races, ages, and gender identities, with a particular focus on traditionally disadvantaged groups. Moreover, we are concerned with strengthening diversity in expertise and functional background, e.g., in terms of the research field that an individual identifies with most in order to support CC as an interdisciplinary research endeavour. In order to devise effective strategies to be more inclusive and increase as well as sustain diversity, we analysed the diversity of the CC community. Our work on this task is ongoing, and we describe preliminary results on the diversity in (i) conference authors and submissions and (ii) program committee members in this report.

First Steps Toward Better Understanding the ICCC Community

To inform the previous tasks and to better understand the active ICCC community more generally, we gathered statistics relating to published papers, their authors, and the program committees (PCs) of different years. Here we focus primarily on 2020, as the full statistics are still being gathered.

The main source of our statistics are the proceedings of the conference which include, in addition to the papers and their authors, a list of PC members and their affiliations. The ICCC proceedings provide the foundation for the data which we used, augmented, and evaluated in this paper. In compliance with the European Union’s General Data Protection Regulation, we removed the names of authors and PC members in our datasets. We moreover categorised the data and calculated aggregate statistics to improve anonymity.

Results

Analysis of Conference Authors and Submissions

We conducted an analysis of the authors submitting to ICCC since its inception in 2010. The total number of different authors was 706. In order to analyse this data, we established three time periods: the first five years of the conference series (2010-2014) and two periods from the last 6

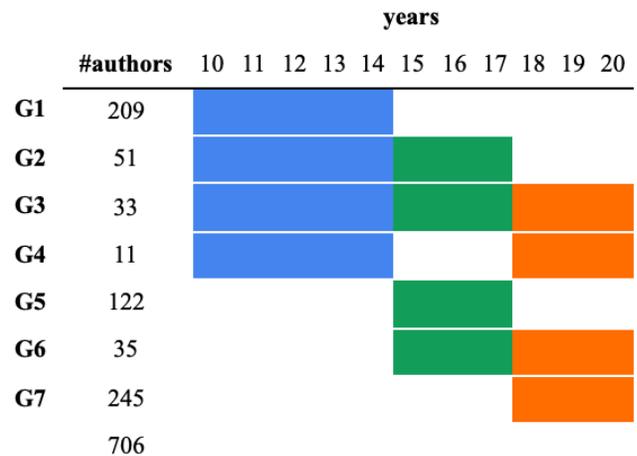


Figure 1: ICCC 2010-2020 author groups. The figure shows the number of authors of seven groups (G1-G7) based on three time intervals (marked in blue, green and orange): the first five years of the conference (2010-2014), years 6 to 8 (2015-2017), and the last 3 years (2018-2020). For example, G1 are authors that only published in the first five years.

years (2015-2017 and 2018-2020). These periods were used to divide the authors into groups according to their publication behaviour—i.e., whether they published papers in these periods or not (see Figure 1). From the results we can see two significant groups: G1—authors that only published in the first five years of the conference—and G7—authors that only published in the last three. The value of this latter group (245) is an indication that the conference is attracting new people. G5 is also worth mentioning as it consists of authors that only published in the period 2015-2017 and were not retained for the following years. In contrast, G6 are authors who first published in the conference during the 6th - 8th years and continued publishing (have accepted papers in the last three years). Additionally, there are 44 authors who have published in the first five and in the last three (G3+G4) years of the conference.

In order to further study the growth of the conference in recent years, we have focused on new authors and their retention (see Table 1). The data collected concerns the number of new authors in the papers (short and full) that were submitted and accepted in the last three years. Though data on accepted papers is available for all three years, we were only able to obtain data regarding submissions (both accepted and rejected) for 2020. Table 1 indicates an increasing trend in the number of different authors on individual papers, and this trend also occurs in the percentage of new authors—43.8% in 2018, 58.2% in 2019 and 70.9% in 2020. Something that clearly stands out is the increase of 107.46% in the number of new authors from 2019 to 2020 (67 vs 139, respectively). A similar increase is visible in comparing the number of full papers submitted in 2019 (52) with those from 2020 (80). Even though we cannot be certain of the reason behind this substantial increase, we hypothesise that it was due to a combination of an improved

	submitted		accepted		Retained
	new	total	new	total	
2018	.	.	39	89	.
2019	.	.	67	115	7
2020	230	299	139	196	10
2019-20	20

Table 1: Analysis of new authors. The number of new authors and total authors both in papers submitted and accepted (including full and short papers). The table also shows the number of authors retained, i.e., new authors that published in a subsequent year. We only considered the three years from 2018 to 2020 and the two-year interval from 2019-2020. The 2019-2020 number indicates the sum of new authors in 2018 with submissions in 2019 or 2020 and new authors in 2019 with submissions in 2020. Values that we were not able to collect are marked with .

Call for Papers, as detailed earlier, and a more aggressive dissemination process.

By analysing the papers, it is possible to identify the context of submission by new authors. Table 2 summarises the results of our analysis in terms of new versus returning authors in the years of 2019 (full and short papers) and 2020 (full, short, and workshop papers), for submitted papers (S) and accepted papers (A). The table shows the percentages of papers with all recurrent authors (R), i.e., papers in which all authors are returning authors, papers with at least one new and one recurring author (RN), and papers with authors that are all new to ICC (N). The label #P refers to the total number of papers. Even though the analysis in the previous paragraphs did not concern workshop papers, we decided to include them in the analysis of the submissions. Overall, we find that submissions with all recurrent authors comprised only 25% of the 2019 full paper submissions and 22.5% in 2020—which increased to 32.56% of accepted papers. There were 44.23% and 46.25% full paper submissions by all new authors for 2019 and 2020, respectively. We observe the lowest percentages of all recurrent authors for short papers, and the highest percentages of all new authors in workshops. Another interesting fact is the high percentages of mixed recurrent and new authors (RN); they highlight that contributors to past editions tend to bring new people to the conference rather than working only with other recurring authors. Table 1 also shows the numbers of retained authors in 2019, 2020 and a combination of 2019-20, which translate into retention rates of 17.9%, 14.9%, and 18.8%, respectively.

Analysis of the Program Committee

As a starting point for analysing trends in the composition of community leadership, we analysed and compared the diversity of regular and senior PC members in the 2020 instance of ICC.

Data Collection We have considered diversity in terms of gender, place of work, professional experience, and affiliation with academia or industry. We considered the members’

	2019		2020			
	full	short	full	short	ws	
S	R	25.00%	.	22.50%	11.94%	25.81%
	RN	30.77%	.	31.25%	38.81%	12.90%
	N	44.23%	.	46.25%	49.25%	61.29%
	#P	52	.	80	67	31
A	R	25.00%	23.08%	32.56%	17.07%	26.92%
	RN	33.33%	38.46%	34.88%	48.78%	15.38%
	N	41.67%	38.46%	32.56%	34.15%	57.69%
	#P	36	13	43	41	26

Table 2: Submission Analysis. Results for the years 2019 (full and short papers) and 2020 (full, short and workshop papers) in terms of percentage of new and recurring authors and total number of papers (#P), for submitted papers (S) and accepted papers (A). We have three categories: papers with all recurrent authors (R); papers with at least one new and at least one recurring (RN); and all new authors (N). The values that we were not able to collect are marked with .

job titles as proxy for the latter two categories. We gathered the corresponding data using the following methods:

- *Gender*: For our purposes, the term ‘gender’ does not directly refer to either the sex of the author (at birth or chosen later) or the gender of the author (socially assigned or self-chosen). Instead, ‘gender’ in our analysis was determined based on the gendered word usage associated with an individual on public websites (such as their institution-specific profiles or biographies featured on a research paper). For example, a PC member with an online biography containing the pronouns “he” and/or “his” was assigned a gender of male. Since even institutional pages may misgender people, these data do not necessarily reflect people’s chosen identity, and are thus only an estimate.
- *Continent of Work*: The geographic location of each PC and senior PC member was assigned based on their reported work institution. This data does not speak to the full cultural background of the people involved in the committees, but reflects in general on the geographic balance of the committee. In order to arrive at a set of useful, but general categories, we used continents as markers for different categories based on the seven continent model. Where members have affiliations with institutions across multiple continents, we considered each affiliation separately.
- *Experience and Affiliation with Academia or Industry*: The professional experience of the committee members was inferred from their current job title, gathered from publicly available sources. We used Google Scholar and LinkedIn profiles, and finally institutional pages when the former two were unavailable or did not list the required information. No information could be found for three PC members, and they were thus omitted from our evaluation. Academic roles were categorised as per the defacto standard used in universities from the United States. On average, we expect researchers from an arbitrary country most likely to be familiar with this than with any other rank system. Moreover, the US system has arguably a very

low resolution, and its use thus decreases the chances for misclassification. We furthermore used these job titles to distinguish roles in academia and industry.

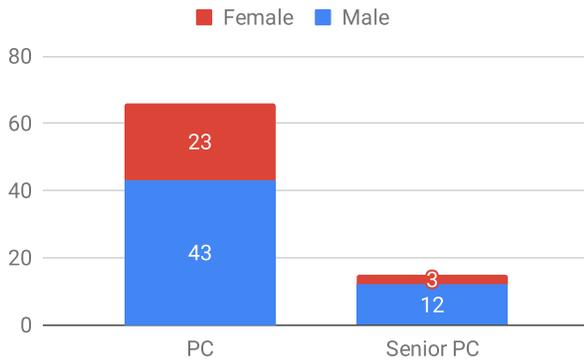


Figure 2: Gender distribution of the regular and senior program committees (based on gendered word usage).

Findings: Gender Distribution We found a strong gender inequality in the two program committees, with members classified as female being in an even larger minority in the senior PC. Across both committees, less than one third of all members have been classified as female. Figure 2 illustrates the corresponding ratios.

Findings: Continent of Work We found that some continents, despite being home to institutions that make strong contributions to research, are severely underrepresented. This is most striking for Asia, which is only represented by three regular PC members. Australia and South America both have four regular PC members, but Australia is also represented by two senior members. Crucially, Asia and South America are not represented in the senior PC, and Africa is not represented in either committee. The two continents with the most representation in both committees are North America and Europe. Over 50% of members in both committees work at European institutions. A breakdown of PC members by continent of work is presented in Figure 3.

Findings: Professional Experience The regular and senior committees are both primarily comprised of researchers at the assistant professor level or above. Regular PC members are typically only recruited into the senior PC after having collected substantial research experience beyond their PhD. This is reflected in the absence of PhD students and postdocs in the senior PC. Our findings, as illustrated in Figure 4, do not reveal any unexpected diversity issues given this recruitment policy. We do, however, find that the vast majority of members in both committees have academic roles, although a substantial amount of relevant work which could be submitted to ICCV is nowadays conducted in industry. The latter ratios are highlighted in Figure 5.

Findings: Paper Submissions We also crossed the data from the PC with data from the conference papers (previously described) to assess how the members of the PC are

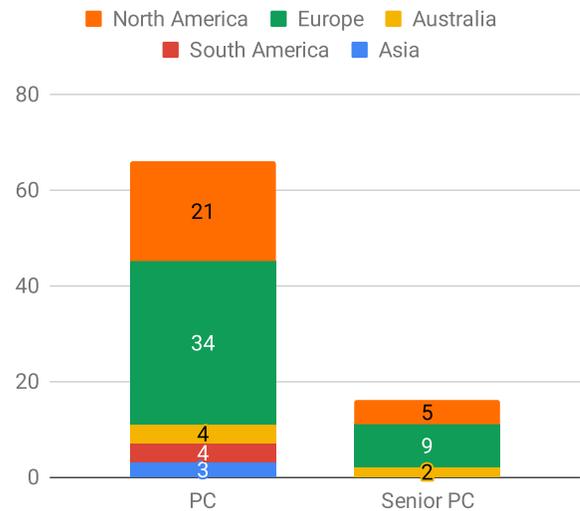


Figure 3: PC members' work continent, based on their reported institution and the seven continent model. Continents with no active PC members have been left out. Where members have affiliations with institutions across multiple continents, we considered each affiliation separately.

contributing to the conference. We analysed four groups of people: (i) members of the ICCV'20 PC, (ii) members who have been part of the PC since 2019 and (iii) since 2020, and (iv) members who were once in the PC but have not been a member in the past 3 years (no longer PC). For each of these groups, we present the number of people that have published at least one paper in 4 time periods (ICCV'20, past 3 years, past 5 years and never). The results can be found in Table 3. We notice that only 25 members of the current PC have at least one accepted paper in ICCV'20 and 47 in the last 3 years. Even more striking is that 15 PC members have never published in ICCV. We note though that this includes 9 people that have only joined the PC in the last 2 years. This number may be alarming if one considers that a PC member is supposed to contribute with their own work. On the other hand, it indicates that there is space for people who may be good assets to the PC even though they do not publish. Another interesting result is that people recently added to the PC have already contributed with papers to the conference. Moreover, some of the people who are no longer members of the PC continue to publish.

Discussion and Future Work

Our work so far has shown that there are improvements to be made regarding two different aspects: scientific and social. Regarding the latter, based on the initial results of our PC analysis, we highlight the need to establish and sustain gender identity equality across both the regular and senior PC. Based on the results reported by Wang et al. (2019), the average proportion of female authors in computer science is currently 27%. Even though this is not directly comparable

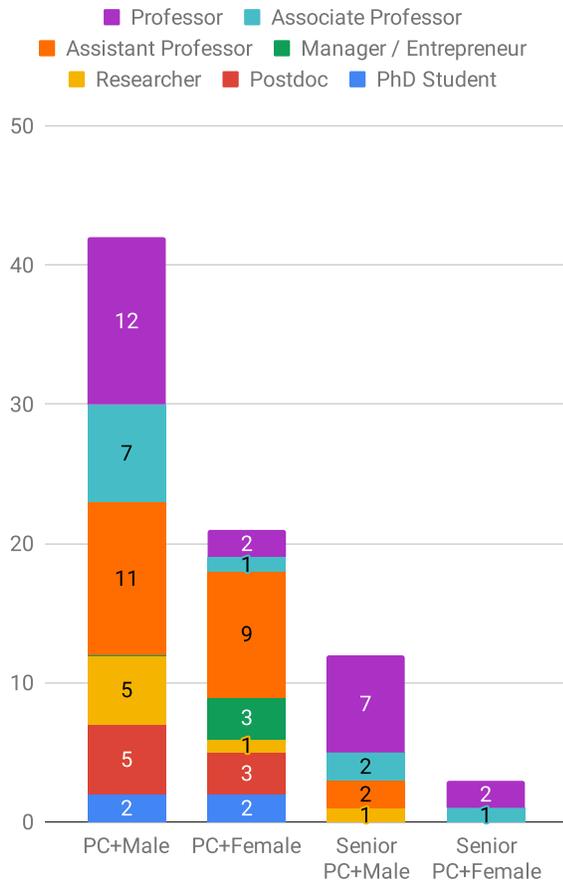


Figure 4: PC members' professional experience, based on job titles mapped to the US Rank System. Academic and industry postdocs and researchers are jointly considered. We only took into account primary jobs, and left out three PC members for whom job information could not be obtained.

to the PC composition, it suggests that some effort has been made to achieve the 32% (see Figure 2) assumed gender ratio in the ICCC'20 program committee (regular and senior). Nonetheless, more work needs to be done to identify and include emerging non-male-identifying researchers. Moreover, we recommend recruitment of more members from presently underrepresented continents, in particular from Africa, Asia, and South America. To this end, it might be worthwhile to consider whether some of the present Asian or South American regular PC members would be suitable for a senior role.

When it comes to the scientific aspect, several topics should be addressed. First, we should improve the perception of ICCC as a welcoming venue. We have already made progress toward this goal in the form of our proposed changes to the Call for Papers (specifically the *CC Translations* category) which have successfully attracted new authors. Similarly, we should keep promoting and make good

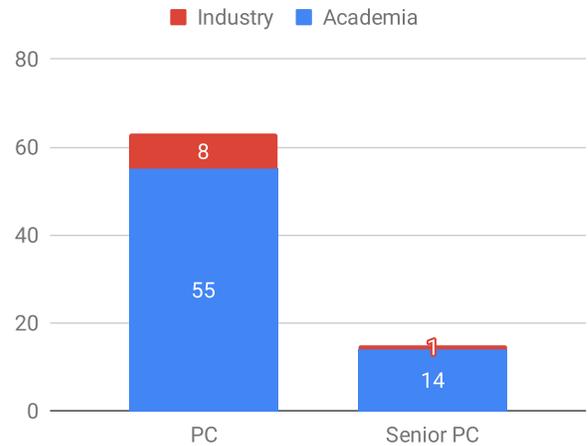


Figure 5: Academic and industry representatives in PCs. Three members without job information were left out.

	ICCC papers published				T
	2020	3 years	5 years	never	
ICCC'20	25	47	64	15	81
since 2019	1	5	5	5	10
since 2020	4	6	6	4	10
no longer PC	6	7	14	37	67

Table 3: Paper contributions by PC members. The table shows the number of people in regards to PC membership and ICCC paper publication. The categories presented are: 2020 refers to people with at least one paper in 2020; 3 years refers to the number of people with at least one paper in the past 3 years (2018-2020); 5 years refers to people with at least one paper in the past 5 years (2016-2020); and never refers to people who never had a paper in ICCC. We present results for four groups of people: members of ICCC'20 PC; people who have joined the PC in 2019 (since 2019) and in 2020 (since 2020); and people who were at least once in the PC but have not been a member in the past 3 years (no longer PC). *T* is the total of people in each group.

use of the short paper and workshop tracks as they have been shown to come with the highest percentages of new authors.

Our analysis of 2019 and 2020 ICCC submissions revealed an initial picture of returning versus new authors. Nonetheless, it will be important to assess the causes for authors to move away from ICCC. More analysis will be needed in future years, especially since the 2020 pandemic might have extraordinarily affected conference submissions.

It is not only important to attract new people but also to give them the opportunity to actively contribute to the community early on. One way of facilitating this is to increase the number of PhD students and postdocs in the regular PC. Additionally, since more and more relevant research contributions are submitted to ICCC from industry, it would be desirable to have more industry representatives in both committees to ensure that these contributions receive construc-

tive feedback and appreciation. As we identified in our analysis, the existence of PC members who have not yet published is an indication that there is space for people who may be good assets to the PC even though they do not publish often. We should carefully consider though what these members bring to the table, e.g., in terms of valuable expertise from adjacent areas. One example is artists, who could certainly bring a valuable perspective to the review process. We should also identify former PC members that are still actively contributing to the conference, and carefully consider the merits of inviting these individuals to rejoin the PC.

The first step towards including both young, ambitious researchers and representatives of other fields and professional domains (e.g., industry) is to design a more systematic procedure for recruiting members to the ICCC PCs. This policy should not only value scientific contributions but also an individual's potential to stimulate ICCC's interdisciplinarity.

In general, we believe that there are great opportunities for growth, and ICCC should continue to seek its place as a central venue of the CC field. To this end, we should not only seek to maintain and increase the quality of research, but also foster interdisciplinarity and diversity through the implementation of concrete measures to reach under-represented groups and communities.

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