The Gender Gap and the Computer Music Narrative - On the Under-Representation of Women at Computer Music Conferences

By Emma Frid

In a paper presented at ICMC 1995 Mary Simoni hypothesized that "the reason there are so few women in computer music is because the complex process of socialization has simply filtered them out", comparing this chain of events to subtractive synthesis, suggesting that

> "those few females that pass through the series of filters, escape only to find that their signal strength has been attenuated by 3dBs".

More than twenty years later, the problem of under-representation is still highly relevant, as voiced by Frida Abtan (2016, 53): "At conferences and workshops, there are always a few of us eyeing each other and asking ourselves: why are women still so under-represented in electronic music?" In 2017 I published a paper at ICMC that highlighted this gender gap through sonic representations of female author names in the International Conference on New Interfaces of Musical Expression (NIME), Sound and Music Computing (SMC), and ICMC conference proceedings.[1] Findings suggested values consistently below 20%. In 2021, I updated this dataset and sonified the results for the IRCAM Manifeste event Féminisme – Musique – Technologie (Sound examples available at https://youtu.be/rEgMKINIU5E, accessed October 2021), which featured researchers and artists who address the themes of cyber-feminism by crossing social issues of inclusion and intersectionality with technological and cultural contexts.[2]
The gender gap has not drastically changed since 2016, however, there are some indications suggesting that numbers are trending in a positive direction.

Temporal analysis of predicted genders[3] of unique author names in the ICMC proceedings from 1975 to 2021 suggests a tendency towards higher percentages of female author names in more recent years, with numbers ranging from 2.8% (in 1981) to 16.2% (in 2017) and an overall of 10.4% female names (Figure 1).[4] Of course, prediction methods based on first names have clear limitations since such classifications do not necessarily correspond to ac-

tual gender identities.[5] Moreover, these binary methods do no account for all gender identities. The representation of women estimated by predicted genders of author names can be compared with ICMA membership rates based on self-reported genders. These figures also suggest higher percentages in recent years, with female members ranging from 14.1% in 2009 to 23.8% in 2019 (membership rate data was analyzed for 2006–2021).

Data from other conferences confirm that under-representation of women is also an issue in related disciplines, even if some figures suggest that there are trends towards more balanced demographics. A recent study on NIME demographics suggested an overall percentage of 17.5% female authors and that an "ideal" gender balance could be reached around 2025 (Fasciani and Jackson, 2021).[7] The SMC conference is experiencing increasing female involvement, with 20% female authors in 2019 (Mauro et al., 2020, 5). For the proceedings of the International Conference on Auditory Display (ICAD), 20% of the authors between 1994 and 2016 were reportedly female, with annual percentages remaining relatively unchanged over time, despite an increasing number of publications co-authored by women

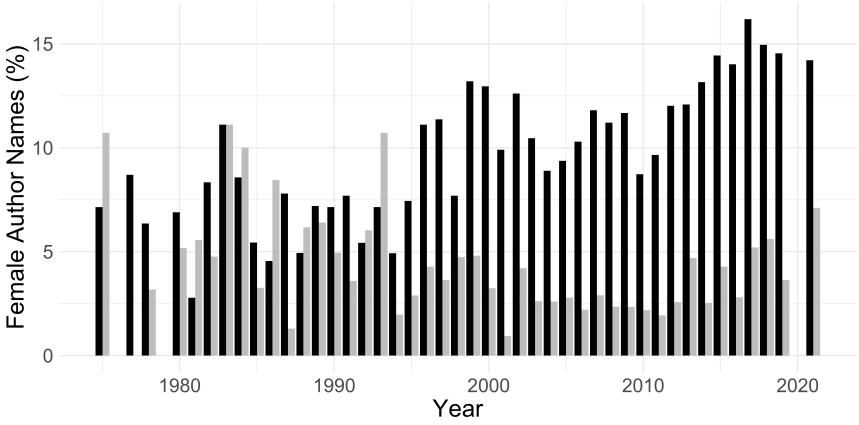

Figure 1: Percentage of female (black) versus unknown (gray) author names in the ICMC conference proceedings. Empty years are displayed when data is missing or when no conference was held.[6]

(Andreopoulou and Gouodarzi, 2017, 3-46).[8] The International Society for Music Information Retrieval Conference (ISMIR) proceedings had 14.7% female authors from 2001 to 2015, with lead female author rates not improving over time, although there have been more papers with female co-authors in recent years (Hu et al., 2016, 765-767).[8] Overall, representation of non-male authors at audio engineering conferences are low, and there is also a notable lack of gender diversity among invited speakers (Young et al., 2018, 328).[9]

The above-mentioned numbers raise questions about how we can ensure that the breadth of the transnational electronic music community's work is represented at conferences.[10] Possible actions to foster inclusion and diversity include ensuring a fair representation among keynote speakers, performers, reviewers, and steering committees; offering scholarships; providing support systems and appropriate facilities at conference venues (for example, offering affordable on-site childcare and all-gender bathrooms); and formulating diversity and inclusion statements[11] with action plans. Interventions should take into consideration that members of additional underrepresented groups may experience effects that interact with, and increase, gender bias (see e.g., Armstrong and Jovanovic, 2015). As emphasized by Goh and Thompson (2021, 2), conceptualizing gender as singular, oppositional, and universal may obscure its co-constitution with sexuality, race, class and disability (see also Goh, 2014 and Thompson, 2020). Other important aspects to consider in the conference context are citation practices (it is well known that women in academia are under-cited in work across disciplines, see e.g., Larivière et al., 2013), the use of inclusive language, and what biases and exclusionary discourses that we may (although possibly unintentionally) conform to. Finally, we should all reflect on how we can contribute to the creation of safe spaces to work in and how we can cultivate an environment where everyone dares to speak up if someone is treated in an unfair manner. For a summary of additional suggestions for conferences, see for example Llorens et al. (2021, 2054).

Under-representation may discourage people to approach a career in the computer music field since it

may not seem likely that such an endeavor would be worthwhile based on prevailing gender bias: on one end those identifying as women should ideally over-perform to stand out in the subtractive filtering process described in the work by Simoni, on the other hand, some may claim that women's work will not be evaluated with the same scrutiny since women are subject to a quotation system that will ensure success, regardless of skills and competences (the act aimed at promoting a change is in this way used as yet another argument to discredit the work of those identifying as women). Social constructs cementing gender norms can hinder the growth and creativity of the community, regardless of gender identity. Balancing numbers is not enough if the interventions aimed at supporting marginalized groups fail to acknowledge the actual importance of their work.[12] We should encourage a self-reflective practice and support attempts to give voice to different experiences and perspectives in our field. The gender gap will not be solved by itself; the modest tendencies towards an increase in representation of women reported here highlight the need for additional initiatives aimed at widening participation, to ensure that all members of the community are represented in the published works that shape the computer music narrative.

Notes

[1] The data consisted of predicted genders based on the authors' first names, see Frid (2017).

[2] The 2nd seminar on cyber-feminism organized by Frédéric Bevilacqua, Sarah Fdili Alaoui, Stéphanie Pécourt, Sara Anedda, Suzanne Berthy, and Sylvie Benoit, with Caroline Bassett, Cécile Chevalier, Sharon Webb, Anna Xambó Sedó, Karolina Jawad, Hyacinthe Ravet, Claire Williams, Sarah Wery and Charo Calvo. See https://www.ircam.fr/agenda/feminisme-musique-technologie/detail/ [accessed October 2021] for more details.

[3] Gender labels were obtained using the genderize.io API, see https://genderize.io/ [accessed October 2021]. In situations where the software framework outputted a probability below 0.8, manual search for pronouns was carried out.

[4] Fitting a regression model with Autoregressive Integrated Moving Average (ARIMA) errors we obtain a positive increase of .17 $\pm$ .1% per year ($p < .001$). A test for the slope of the fitted line after taking account of the serial correlation suggested that we can reject the hypothesis that the mean increase is equal

to zero (95% CI [0.15, 0.19]).
[5] It should be noted that there are many gender identities that fall outside of such a binary categorization, and that the best approach for quantification would involve contacting all authors to ask how they describe their own gender identity (in a free-text format).
[6] The 2020 conference was canceled due to COVID-19, and selected proceedings were published in the 2021 edition.
[7] Gender labels were obtained using a binary classification method. A previous study based on manual labeling indicated that the overall percentage from 2001 to 2017 was 14% (Anna Xambó Sedó 2018, 2).
[8] Figures based on manual labeling.
[9] This work used a novel method designed to avoid the assumptions associated with determining gender from first name to allow for non-binary gender identification based on pronouns collected through emails and manual labeling.
[10] I want to acknowledge that those who publish at computer music conferences only constitute a subset of the community of computer music practitioners. For other work focused on under-representation going beyond academic publishing, see e.g. the female: pressure FACTS survey: https://femalepressure.wordpress.com/facts2020-pressrelease/ [accessed October 2021] and work by Brereton et al. (2020).
[11] However, as pointed out by Hayes and Marquez-Borbon (2021, 34): "openness to diversity does not automatically result in it". Diversity and inclusion statements should always be combined with actions to promote change.
[12] As articulated by Born and Devine (2016, 14): "Although [widening participation or balancing demographic profiles] are crucially important goals, by addressing only participation rates and skewed demographics we confront the surface manifestations of wider, more diffuse and resilient long-term processes."

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