Shaking the Tree: Understanding Historic and Future Representation of Women at OzCHI

Dana McKay
iSchool, School of Computing and InformationSystems
University of Melbourne
Melbourne, VIC, Australia
danamckay@unimelb.edu

George Buchanan
iSchool, School of Computing and Information Systems
University of Melbourne
Melbourne, VIC, Australia
george.buchanan@gmail.com

ABSTRACT

Gender equity is an issue of increasing importance in the technology industry generally and HCI specifically. Women are historically underrepresented at all levels, but moreso in senior roles; conversely visible senior women increase female participation generally. In this paper we present the first scientometric analysis of OzCHI examining the interaction between gender and role seniority, showing that overall female representation is quite good, but we need to be cautious to preserve it. This is the first analysis of this type to examine the issue of gender in any HCI venue.

CCS CONCEPTS

• **Social and professional topics~Gender** • Social and professional topics~Industry statistics • Social and professional topics~Employment issues • Human-centered computing ~Human computer interaction (HCI)

KEYWORDS

Human-computer interaction, research, sex equality, gender representation.

ACM Reference format:

Dana McKay, George Buchanan. 2019. Shaking the Tree: Understanding Historic and Future Representation of Women at OzCHI.. In *Proceedings of Australian Conference on Computer-Human Interaction (OzCHI19). ACM, New York, NY, USA, 4 pages.* https://doi.org/10.1145/1234567890

1 Introduction

The challenges of gender representation in technology are well known and well documented [6; 12; 31; 39; 47]. One of the major issues in this space is the 'pipeline problem'; where the rate of attrition of women in technology fields is much higher than that of men [14; 31; 47]. There has been a significant stream of research within HCI on opening up the front of the pipe to make technology fields more inclusive, for example these works on gender-inclusive programming tools [8; 23]. Equally, there is a subdiscipline of HCI known as feminist HCI focused on ensuring that the science we do is not sexist [40]. It is perhaps surprising, then, that we have not often turned the lens on ourselves, and examined gender representation within our field, and whether we are doing all we can to support gender equity. Arguably this is because we demonstrably have a lower gender imbalance than computing as a whole [15], at least in academic computing.

We nonetheless argue that gender diversity is just as important in HCI roles as in other technical fields, and for all the same reasons. Diversity in teams demonstrably produces better outcomes [43] and facilitates creativity [32; 42]. There is further a strong tendency in HCI specifically and technology generally to engage in the "I-methodology"—using one's own experience to drive design [12]. Certainly non-diverse teams produce results that do not work for all users, such as the challenges with voice recognition software and women's voices [41], or the Oculus Rift producing more motion sickness in women [36].

There are a number of ways of measuring diversity in a field: comparing the number of graduates with specific characteristics (e.g. [6]), comparing the number of employees in a field with specific characteristics (this is often done at various levels to show retention, e.g. [5; 13]), and—in academia—bibliometric analysis (e.g [28; 48]). This paper takes a combination of the latter two techniques, performing a scientometric analysis of author gender for the past 5 years of OzCHI data, and examining the gender balance of senior roles within the conference.

The reason we compare senior role holders is that one of the known means of increasing gender diversity in technological fields is having visible female role models [9; 31] and senior editors [18]. Thus, in academic computing and HCI, it is important to have visible and prominent high-ranking female academics serving in senior roles in publishing and at work generally. At conferences this means having female academics in senior technical roles—general chair and programme chair roles.

The purpose of this analysis is to understand the existing level of gender diversity in the OzCHI community, and to understand whether we are supporting and promoting women within the community—and thus retaining them. This is the first scientometric analysis of any HCI publication to specifically address the issue of gender.

The remainder of this paper is divided up as follows. First we give a literature background to this work, then outline our methodology. Next we give our results, and discuss them in the

context of the literature, offering conclusions and suggestions for promoting gender diversity within OzCHI into the future.

2 Background

In this section we will address the literature demonstrating the challenges of diversity in technology fields specifically and STEM in general. We will address the deep need for diversity in HCI, and look at some strategies for successfully promoting gender equity in STEM fields. We will address the issue of gender in academia, and strategies for challenging the difficulties women face. We will conclude with previous analyses of HCI conferences.

The underrepresentation of women in technology and other STEM fields is well known and much discussed (e.g. [6; 12; 44; 45]). Early work on this topic assumed that there was some intrinsic difference between men and women that promoted this disparity, and that it was therefore impervious to any attempt to change it [38]. This assumption has been debunked, by the changing numbers of women in STEM over time [28] and by comparing between countries [12]. The considerable science examining gender differences also debunks the notion that women are intrinsically averse to or incapable of STEM careers [19].

More recent work on the issue of gender in technology demonstrates that socialisation and culture are big predictors of female participation. This begins early, where boys have more access to family computers [31], and continues through university [25] to the workplace, where a hypermasculine 'brogrammer' culture [39; 47] is alienating to women.

The arguments for improving women's representation in tech are twofold. The first relies on equity generally: women should have access to careers in technology; this is part of the ACM code of ethics to which OzCHI is subject [1]. The second argument for women in tech relies on the 'half the sky' argument: that there is a dearth of talent in tech generally, and that varied life experience and diverse teams make for better design [32; 42]. Tools that are poorly designed for women are in and of themselves an equity issue; HCI influences design. As many technical people and indeed HCI folk consider themselves when thinking about users [12], the lack of diversity in tech roles means that technology often does discriminate against women. This can be as simple as performing poorly for women, such as Oculus Rift [36], voice recognition [41] and facial recognition [30], or it can be more insidious. Twitter's design, for example, makes it hard for women to avoid rape and death threats; many leave the platform as a result [4].

There are certain tried-and-tested methods for increasing the numbers of women in tech, and retaining them once they are in. These methods include: ensuring women have a peer group that includes other women [31]; ensuring that for students some of the examples and assessment they are given reflects their interests [39]; minimising hostility, microaggressions and harassment [39]; and ensuring visible, relatable female role models [9; 20; 21; 31]. One of the challenges, particularly with the last point, is that due to the already small numbers of women in senior positions, there can be quite a high burden of representation on individual women. Thus, ensuring this is accounted for in how those women are evaluated [34], and spreading the load is important.

Academia is far from immune to gender bias. Women are discriminated against in numerous ways, most of which have been cogently summarised by Vettese [46]. Key elements of this bias include discrimination in peer review [45], particularly for grant applications [3; 44]; underrepresentation in academic citations [17; 24]; lower teaching scores for comparable teaching [11; 33]; and higher pastoral care and service loads [2; 22]. Senior academics are often men [2], particularly in fields where 'genius' or 'brilliance' is seen as the entry requirement [5; 26]; in these fields a lack of access to power networks affects women's advancement. Double-blind peer review—already policy at OzCHI—has been shown to lead to more gender-balanced outcomes [45], and visible senior women and availability of senior female mentors also has a measurable impact of female participation [9; 31] and publication [18]. This paper asks whether OzCHI is addressing the need for senior female representation.

One question we might ask is whether fields where women are well represented—and relative to other computing disciplines, HCI is one of these fields—face the same disparities. Information science is a field related to HCI that has strong female participation. A recent analysis of one of their main conferences shows that there is no bias against women in the peer review process; a positive finding. Less positive, though, is the fact that relative to authors men are overrepresented on the program committee, and even so they do less reviewing [10]. Some of the biases in academia clearly extend even to well-balanced fields.

So what, then, of HCI? There have been a number of studies of conferences in the HCI field to understand various features of both the community and the impact of its publications. Many of them use—as we have—a scientometric approach. None of them have specifically addressed the issue of gender. A study of CHI shows that papers involving collaboration across institutions are more likely to be accepted, but less likely to be cited [7]. A review of CSCW venues shows CSCW to be an influential field [16]; while it does not specifically address the issue of gender, it does publish a list of the most influential authors; only 25% are women. Looking closer to OzCHI, a scientometric analysis of the New Zealand conference on human computer interaction, CHINZ, shows that it has little impact outside New Zealand, but also that of the most published 12 authors, only 4 are women [37]. Finally, there has been one bibliometric analysis of OzCHI to examine [35] its international impact. This analysis examined frequent authors in a number of positions, including overall, first, and 'prestige last', but did not address gender specifically. Based on this analysis we can see that women are publishing at OzCHI—

three of the five most frequent first authors are women, and three of the five most frequent overall authors. The 'prestige last' is tipped toward men, however, three of the five being male.

Surprisingly, many of the scientometric papers addressing HCI venues present data that demonstrate gender representation, but do not comment on it; this paper aims to address that gap.

3 Method

Many of the papers addressing gender balance reported above use a scientometric or bibliometric approach [7; 10; 16; 35; 37]; our paper does the same. There are two ways of doing scientometric research: automatically, and manually. Automatic approaches are necessary for large datasets, but are not 100% accurate in assessing gender, particularly for non-English names [29]. The OzCHI community is relatively small, and manageable by manual analysis; as such we have taken a manual approach. We used socially ascribed gender in our analysis. We did not enquire with individuals as to how they identified, as any differences in treatment are likely more ascribable to how individuals are perceived than how they identify.

The role of individuals in organising OzCHI each year is a matter of public record, readily found in the online repository of OzCHI conferences. The first OzCHI was in 1988. However, full details of the earlier years are not available. In addition, the Australian HCI community has developed over time, but particularly in the last few years, so there is a good argument for using more recent data. In addition, gender representation and other diversities are more publicly visible as issues in the recent past. This would again suggest an emphasis on the more recent conferences. A final argument for focussing on more recent conferences is that establishing the identity and characteristics of a person is easier. This is because over time those studying research and coursework degrees may disappear from research group or other institutional web pages.

Focusing on a single year of OzCHI may give a skewed picture; each year has its own theme and location, and there may be any number of factors at play. Thus we decided to examine five years of conferences, as this would provide opportunity for individuals to progress in their career, and mitigate the worst risks of data from a single conference.

Our data therefore included Sydney in 2014, Melbourne in 2015, Launceston in 2016, Brisbane in 2017 and Melbourne in 2018.

For each conference, we analysed two sets of data: 1) the author lists for full papers published at each conference; and 2) the organising committee for each conference. For each year, we identified author and chair personnel's gender by examination of their online profile. For a few individuals, insufficient data was available to ascertain this information, and as reported in results, these individuals were discounted from further analysis. This only applied to authors, as we were able to verify the details for all chair personnel.

The structure of the organising committee can vary, with a number of occasional roles such as social chair or publications chair that do not occur every year. We limited our analysis to the following roles, which are consistent across years:

- General Chair
- Long Papers Chairs
- Short Papers Chairs
- Poster and Demonstrations Chairs
- Panel Chairs
- Workshop Chairs
- Student Design Competition Chairs
- Doctoral Consortium Chairs
- Student Volunteer Chairs

We also broadly divided these roles into 'prestige' roles, the general, long- and short- papers chairs, 'social' roles, including the doctoral consortium, student design competition and student volunteer chairs, and 'other' roles which covered the remaining three roles.

In order to provide a comparative baseline, we needed to arrive at some data to represent the HCI community at OzCHI. For reasons of confidentiality, we do not have access to those who submitted papers to the conference, or who attended. There is also no canonical list of who is involved or active in HCI in Australia. However, the record of who published at the conference each year is public. We therefore assembled the name of all the authors of papers, both long and short, published in the proceedings for each of the five years that we were analysing. For each paper, we noted all the named authors, and the order that they appeared in.

For each author, we used their identifying data in the paper, including name, email address, affiliation etc., to establish their gender, institutional home country, and academic seniority (e.g. PhD student, Masters student, faculty member) at the time of the relevant conference. We were unable to trace full details for only two authors from the cohort, and these were set aside in their entirety. The same process was then undertaken for all the organising roles associated with each year.

The question of who is 'Australian' is also relevant to this analysis. We did not seek to identify the nationality of individuals, as this data is simply not available. Rather, we treated the country (nationality) of a researcher's affiliation as their active nationality for the purposes of participating in OzCHI. Anyone with at least one affiliation in an Australian university was identified as Australian, and all others as international researchers.

The analysis then proceeded by consolidating the data for each of the roles above, creating total counts for gender for each. In the case of authorship, we separated Australian first-author from global first-author papers. For each paper, we identified if the first author was male or female; if there was at

least one author of each sex, or if the paper was all-male or all-female; and if there was a female author, the place that they appeared in the author list. This data then provided a baseline against which comparisons can be made in the case of the organising committee appointments.

4 Results

We first report the make-up of the organising committee. We sub-divided these roles broadly into two categories, as described above. This produced summary data as follows, for prestige, social and other roles respectively. Each year that a person serves in a role is counted separately, and in some cases the same person thus is counted more than once for different years.

Table 1: Relative Representation in Prestige Roles

Role	Male	Female
General Chair	6 (86%)	1 (14%)
Long Papers	7 (64%)	4 (36%)
Short Papers	8 (62%)	5 (38%)
Total	21 (68%)	10 (32%)

We then turned to the student-focussed, or "social" roles in the conference. Here we see a very different picture:

Table 2: Relative Representation in Social Roles

Role	Male	Female
Doctoral Consort.	7 (50%)	7 (50%)
Student Design	4 (29%)	10 (71%)
Student Vol.	4 (31%)	9 (69%)
Total	15 (37%)	26 (63%)

As can be seen, the proportion of genders in the social and prestige roles are close to mirror opposites of each other. We also analysed the other roles found in the different years:

Table 3: Relative Representation in Other Roles

Role	Male	Female
Workshops Chairs	6 (46%)	7 (54%)
Demo/Poster Ch.	6 (75%)	2 (25%)
Panel	4 (50%)	4 (50%)
Total	16 (55%)	13 (45%)

Among the 'other' roles, the profile of poster and demo chairs is closer to the prestige role profile, with a high proportion of male researchers. Otherwise, the proportions of the workshops and panel roles are relatively even—something also seen in the doctoral consortium role that we initially assigned to the set of three student-related roles.

The question is, which of these proportions is close to representing the active researcher profile among the community. We therefore now turn to the profile of authors across the four conferences. First, we present all long paper authors of by gender:

Table 4: Relative Representation in Accepted Authors Figures for Australia only in brackets

Year	2014	2015	2016	2017	2018	Total
Male	83 (31)	112 (43)	85 (33)	82 (34)	60 (29)	422 (170)
Female	59 (28)	57 (26)	35 (17)	53 (29)	30 (17)	234 (117)

Table 5: Relative Representations by Year

Role/Year	2014	2015	2016	2017	2018
Prestige Male	3	5	5	3	5
Prestige Female	2	0	2	2	4
Student Male	4	1	6	2	2
Student Female	3	6	8	5	4
Other Male	1	2	6	3	3
Other Female	1	3	2	3	3
Total Male	8	8	17	8	10
Total Female	6	9	12	10	11

This provides relative proportions of 66% male and 34% female. For Australian authors the values are 41% female and 59% male. The local community is thus more balanced that the author pool internationally, and is the ratio one would expect to find in the organiser group, which is predominantly Australian.

Comparing gender ratios between years is revealing (Table 5). 2015 was an outlier, with no females in prestige roles. That year also saw the highest proportion of females in student-oriented roles. Three years saw slightly more females in total, but 2016 is notable in the very high proportion of males as a while.

When examining seniority, there were no significant differences, except in the case of social roles. There, the average time from PhD was 5.8 years for men, 3.3 for females. 42.3% of females were pre-PhD graduation, versus 31.2% for males.

5 Discussion and Conclusions

Across the senior roles as a whole, the relative proportion of male versus female researchers is close to the long-paper author profile. The results of a chi-square test of these roles as a whole against the author population by gender gives $p=0.358$, far from significant. However, within the small sample of general chairs, there is an apparent bias towards males, and compared to the Australian author proportions of 41/59 female to male, 32/68 does suggest a small overall bias towards males.

In contrast, the student-related roles are markedly different, with a ratio of 62/38. This unsurprisingly statistically significant, with p=0.0004 (χ^2=6.11). The other roles have a proportion of 45/55, which is marginally more female researchers than in the author list, and again is not statistically significant. This potentially supports the attainability of role models, described in [20], but may not provide the senior support for different voices described in [21] as necessary to support diverse communities.

While our sample is small, the over-representation of women in student roles, and the under-representation of women in very senior roles prompt us to urge caution. Where women are given fewer opportunities to serve in senior roles, this will disadvantage them individually and collectively in their career progression. It is known that women engage in more academic service [2; 22; 34], and so it cannot be simply that women are not interested in these senior roles. Our data shows that even early in their career, female researchers are dedicating to service, e.g. engaging in student-facing roles even during their own PhD.

We must ensure that that female researchers' interest in leadership translates to action; one approach to this is formalising the expectation that women will be represented [27]; another is to ensure that this data remains public [39]. Ensuring senior female representation would further have the benefit of promoting equity in review outcomes, which is better served with a gender-balanced editorial team [18].

Overall, OzCHI is doing better than most conferences in terms of gender representation [15; 16; 35]: we have more female authors and strong gender balance on the organizing committee relative to the author population. Encoding this into conference practice will ensure that individual conference years do not undermine this overall trend. Future work in this space could examine the makeup of the program committee or relative acceptance rates.

This paper is the first scientometric paper to address gender roles and publishing rates specifically at any HCI venue. Arguably we could have submitted it to a scientometrics venue, though other works have published in the venue they write about [10; 35]. We chose to submit this to OzCHI not just to report the state of gender representation, but also to commend and encourage the community. We are doing well, though there is some way to go. Let's keep up the good work.

REFERENCES

[1] ACM, 2018. *ACM Code of Ethics.* https://www.acm.org/code-of-ethics.

[2] Aiston, S.J. and Jung, J., 2015. Women academics and research productivity: An international comparison. *Gender and Education 27*, 3, 205-220.

[3] Albers, C.J., 2015. Dutch research funding, gender bias, and Simpson's paradox. *PNAS 112*, 50, E6828-E6829. DOI= http://doi.org/10.1073/pnas.1518936112.

[4] Amnesty International, 2018. *Toxic Twitter.* https://www.amnesty.org/en/latest/research/2018/03/online-violence-against-women-chapter-.

[5] Bailyn, L., 2003. Academic Careers and Gender Equity: Lessons Learned from MIT1. *Gender, Work and Organization 10*, 2, 137-153. DOI= http://doi.org/10.1111/1468-0432.00008.

[6] Bares, W., Manaris, B., and Mccauley, R., 2018. Gender equity in computer science through computing in the arts – a six-year longitudinal study. *Comp Sci Ed 28*, 3 (2018/07/03), 191-210. DOI= http://doi.org/10.1080/08993408.2018.1519322.

[7] Bartneck, C. and Hu, J., 2010. The fruits of collaboration in a multidisciplinary field. *Scientometrics 85*, 1 (2010/10/01), 41-52. DOI= http://doi.org/10.1007/s11192-010-0242-4.

[8] Beckwith, L., Kissinger, C., Burnett, M., Wiedenbeck, S., Lawrance, J., Blackwell, A., and Cook, C., 2006. Tinkering and gender in end-user programmers' debugging. In *Proc CHI 06* (Montreal, Quebec, Canada), ACM, 231-240. DOI= http://doi.org/10.1145/1124772.1124808.

[9] Bettinger, E.P. and Long, B.T., 2005. Do faculty serve as role models? The impact of instructor gender on female students. *Am Econ Rev 95*, 2, 152-157.

[10] Bogers, T. and Greifeneder, E., 2016. The iSchool community: A case study of iConference Reviews. In *Proc iConference 16* (Pittsburgh, PA), iSchools. DOI= http://doi.org/10.9776/16247.

[11] Boring, A., 2017. Gender biases in student evaluations of teaching. *Journal of Public Economics 145*, 27-41.

[12] Breslin, S. and Wadhwa, B., 2018. Gender and Human-Computer Interaction. In *The Wiley Handbook of Human Computer Interaction*, K. Norman and J. Kirakowski Eds. Wiley, 71-87.

[13] Brown, D. and Parker, M., 2019. *2019 Google Diversity Report.* Google https://static.googleusercontent.com/media/diversity.google/en//static/pdf/Google_diversity_annual_report_2019.pdf.

[14] Ceci, S.J., Ginther, D.K., Kahn, S., and Williams, W.M., 2014. Women in Academic Science: A Changing Landscape. *Psyc Sci Public Interest 15*, 3 (2014/12/01), 75-141. DOI= http://doi.org/10.1177/1529100614541236.

[15] Cohoon, J.M., Nigai, S., and Kaye, J., 2011. Gender and computing conference papers. *Gender and computing conference papers 54*, 8, 72-80.

[16] Correia, A., Paredes, H., and Fonseca, B., 2018. Scientometric analysis of scientific publications in CSCW. *Scientometrics 114*, 1 (2018/01/01), 31-89. DOI= http://doi.org/10.1007/s11192-017-2562-0.

[17] Ferber, M.A. and Brün, M., 2011. The Gender Gap in Citations: Does It Persist? *Feminist Economics 17*, 1 (2011/01/01), 151-158. DOI= http://doi.org/10.1080/13545701.2010.541857.

[18] Filardo, G., Da Graca, B., Sass, D.M., Pollock, B.D., Smith, E.B., and Martinez, M.a.-M., 2016. Trends and comparison of female first authorship in high impact medical journals: observational study (1994-2014). *BMJ 352*, i847. DOI= http://doi.org/10.1136/bmj.i847.

[19] Fine, C., 2005. *Delusions of gender: The real science behind sex differences*. Icon Books Ltd.

[20] Grande, V. and Daniels, M., 2017. A diversity lens on the last decade of the FIE conference: Role models for the engineering community. In *Proc FIE 17*, 1-8. DOI= http://doi.org/10.1109/FIE.2017.8190453.

[21] Grande, V., Peters, A., Daniels, M., and Tedre, M., 2018. "Participating Under the Influence": How Role Models Affect the Computing Discipline, Profession, and Student Population. In *2018 IEEE Frontiers in Education Conference (FIE)*, 1-9. DOI= http://doi.org/10.1109/FIE.2018.8658944.

[22] Guarino, C.M. and Borden, V.M., 2017. Faculty service loads and gender: Are women taking care of the academic family? *Res Higher Ed 58*, 6, 672-694.

[23] Kelleher, C., Pausch, R., Pausch, R., and Kiesler, S., 2007. Storytelling alice motivates middle school girls to learn computer programming. In *Proc CHI 07* (San Jose, California, USA), ACM, 1455-1464. DOI= http://doi.org/10.1145/1240624.1240844.

[24] King, M.M., Bergstrom, C.T., Correll, S.J., Jacquet, J., and West, J.D., 2017. Men Set Their Own Cites High: Gender and Self-citation across Fields and over Time. *Socius 3*(2017/01/01), 2378023117738903. DOI= http://doi.org/10.1177/2378023117738903.

[25] Klawe, M., 2013. Increasing Female Participation in Computing: The Harvey Mudd College Story. *IEEE Computer 46*, 3, 56-58. DOI= http://doi.org/10.1109/MC.2013.4.

[26] Leslie, S.-J., Cimpian, A., Meyer, M., and Freeland, E., 2015. Expectations of brilliance underlie gender distributions across academic disciplines. *Science 347*, 6219, 262-265.
[27] Leuschner, A., 2015. Social exclusion in academia through biases in methodological quality evaluation: On the situation of women in science and philosophy. *Studies in the History and Philosophy of Science Part A 54*(2015/12/01/), 56-63. DOI= http://doi.org/https://doi.org/10.1016/j.shpsa.2015.08.017.
[28] Ley, T.J. and Hamilton, B.H., 2008. The Gender Gap in NIH Grant Applications. *Science 322*, 5907, 1472-1474. DOI= http://doi.org/10.1126/science.1165878.
[29] Liu, W. and Ruths, D., 2013. What's in a name? using first names as features for gender inference in twitter. In *Proc AAAI Spring Symposium* (San Francisco, CA).
[30] Lohr, S., 2018. Facial Recognition is Accurate, if You're a White Guy. In *New York Times* A.G. Sulzberger, New York, NY.
[31] Margolis, J. and Fisher, A., 2003. *Unlocking the clubhouse: Women in computing*. MIT press.
[32] Mcleod, P.L., Lobel, S.A., and Cox Jr, T.H., 1996. Ethnic diversity and creativity in small groups. *Small Group Reseach 27*, 2, 248-264.
[33] Mengel, F., Sauermann, J., and Zölitz, U., 2018. Gender bias in teaching evaluations. *J Europ Econ Assn 17*, 2, 535-566.
[34] Monroe, K., Ozyurt, S., Wrigley, T., and Alexander, A., 2008. Gender Equality in Academia: Bad News from the Trenches, and Some Possible Solutions. *Perspectives on Politics 6*, 2, 215-233. DOI= http://doi.org/10.1017/S1537592708080572.
[35] Mubin, O., Mahmud, A.A., and Ahmad, M., 2017. HCI down under: reflecting on a decade of the OzCHI conference. *Scientometrics 112*, 1, 367-382. DOI= http://doi.org/10.1007/s11192-017-2293-2.
[36] Munafo, J., Diedrick, M., and Stoffregen, T.A., 2017. The virtual reality head-mounted display Oculus Rift induces motion sickness and is sexist in its effects. *Experimental Brain Research 235*, 3, 889-901.
[37] Nichols, D.M. and Cunningham, S.J., 2015. A scientometric analysis of 15 years of CHINZ conferences. In *Proc CHINZ 15* (Hamilton, New Zealand), ACM, 73-80. DOI= http://doi.org/10.1145/2808047.2808060.
[38] Radford, J. and Holdstock, L., 1995. Gender Differences in Higher Education Aims between Computing and Psychology Students. *Res Sci Tech Ed 13*, 2 (1995/11/01), 163-176. DOI= http://doi.org/10.1080/0263514950130206.
[39] Robertson, M., Newell, S., Swan, J., Mathiassen, L., and Bjerknes, G., 2001. The issue of gender within computing: reflections from the UK and Scandinavia. *Info Sys J 11*, 2 (2001/04/01), 111-126. DOI= http://doi.org/10.1046/j.1365-2575.2001.00098.x.
[40] Rode, J.A., 2011. A theoretical agenda for feminist HCI. *Interacting With Computers 23*, 5, 393-400.
[41] Rodger, J.A. and Pendharkar, P.C., 2004. A field study of the impact of gender and user's technical experience on the performance of voice-activated medical tracking application. *Int J Hum Comp Studies 60*, 5-6, 529-544.
[42] Shin, S.J., Kim, T.-Y., Lee, J.-Y., and Bian, L., 2012. Cognitive team diversity and individual team member creativity: A cross-level interaction. *Academy Manag J 55*, 1, 197-212.
[43] Surowiecki, J., 2005. *The wisdom of crowds*. Anchor.
[44] Tamblyn, R., Girard, N., Qian, C.J., and Hanley, J., 2018. Assessment of potential bias in research grant peer review in Canada. *CMAJ 190*, 16, E489-E499. DOI= http://doi.org/10.1503/cmaj.170901.
[45] Tomkins, A., Zhang, M., and Heavlin, W.D., 2017. Reviewer bias in single- versus double-blind peer review. *PNAS 114*, 48, 12708-12713. DOI= http://doi.org/10.1073/pnas.1707323114.
[46] Vettese, T., 2019. Sexism in the Academy: Women's Narrowing Path to Tenure. In *N+1* N+1 Foundation, New York, NY.
[47] Weissmann, J., 2013. The brogrammer effect: women are a small (and shrinking) share of computer workers. In *The Atlantic* Emerson Collective, Boston, MA.
[48] West, J.D., Jacquet, J., King, M.M., Correll, S.J., and Bergstrom, C.T., 2013. The Role of Gender in Scholarly Authorship. *PloS ONE 8*, 7, e66212. DOI= http://doi.org/10.1371/journal.pone.0066212.

Author/s:
McKay, D;Buchanan, G

Title:
Shaking the tree: Understanding historic and future representation of women at OzCHI

Date:
2019-12-02

Citation:
McKay, D. & Buchanan, G. (2019). Shaking the tree: Understanding historic and future representation of women at OzCHI. OZCHI'19: Proceedings of the 31st Australian Conference on Human-Computer-Interaction, pp.412-417. ACM. https://doi.org/10.1145/3369457.3369504.