

Where to send your paper?

Position paper – Dagstuhl Perspectives Workshop

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Abstract

The publication culture in computer science favors publishing in conference proceedings or even in the arXiv over publishing in journals. To restore balance and regain a leading role in the dynamics of the field, the journal tradition in computer science must scale up to the needs of our times. In particular, computer science needs more high-quality journals with a short submission-to-publication time, monthly or even bi-weekly issues, and open-access. Scattered initiatives are beginning to change the publishing scene. The 1999 guideline of Patterson *et al* [25] needs amending to the Internet Age, to guide the assessment of publications and their impact in the present-day context.

1 A culture

The publication culture in computer science favors publishing in conference proceedings or even the arXiv over publishing in journals. While accepted widely within computer science itself, this culture needs endless explaining to other audiences.

In 1994, the *Committee on Academic Careers for Experimental Computer Scientists* [32] already gave an excellent account of the arguments in favor and against the various traditions in computer science publishing. It also emphasized the role of publishing in tenure decisions, with due attention for research that delivers output different from research papers (software, patents etc). The subsequent 1999 memo by Patterson *et al.* [25] is often cited as legitimizing the publication culture as we know it today, although the memo itself primarily addressed the situation for experimental computer science only.

Computer science publishing has grown tremendously since. The bias towards publishing in conferences is increasingly debated, not in the least because of the proliferation of conferences and their often unknown quality to others. It repeatedly puts computer scientists at a disadvantage compared to other scientists in the larger science bodies in which we function. Is it time for computer science to reconsider some of its publication practices? *Scattered initiatives are already beginning to change the scene.*

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In this position paper I will argue for some elements for change. The 1999 guideline of Patterson *et al* [25] needs amending to the Internet Age, to guide the assessment of publications and their impact in the present-day context.

I restrict myself to publication of research papers and do not explicitly consider other valuable research outputs like software, prototyped systems, and patents which often come with different challenges for publication. I will also ignore the undeniably important social aspects of the publication culture.

2 Publishing

Why do we publish, and why has a whole culture developed around it? This is not only a philosophical question.

We publish to record and share ideas. In this way science and technology advance. At the same time research is a profession. Publications are needed for careers and sponsors. The more (and better), the better (in many cases).

The current publication culture in computing science developed over a period of 60 years. Conference publishing became a dominant component of it, putting pressure on traditional ways of research evaluation and assessment.

The guidelines for evaluation in Patterson *et al* [25] were written well before the conference system proliferated and before the internet became our *chief archive*. The publication culture in computer science should cope with his expansion and the effects on the value system for publications.

Also, new initiatives are beginning to develop that may influence the current publication culture and re-establish journals as the key venue in several areas [14]. A case in point is the *new publication model* of ECML/PKDD 2013 [5, 6] which combines journal and conference publishing in a single concept. Shouldn't it be adopted for all of computing science, at least in principle?

3 Publication outlets

Let's look at the status quo. The relevant results of research should be documented in a way that makes the results:

- *refereed* quickly (*Ref-q*) and thoroughly (*Ref-t*),
- *accessible* quickly (*Access-q*) and for years to come (*Access-y*),
- *verifiable* (*Verif*),
- *reproducible* (*Reprod*), and
- adding to the *visibility* of their inventors (*Visib*).

I omit other criteria such as how different types of publications are included in citation indexes, or how recognition depends on the specific publication culture in an area. See [21] for this. Likewise I will not discuss the effect of the *research-innovation cycle* on the short- or long term character of publications.

Also the possible effects of new technologies on publication styles is not discussed although these could affect current publication practices drastically, see [7].

Journals

The advances of science are traditionally recorded in journals. Tenure decisions and research evaluations favor journal publications over conference papers, despite all our arguments *au contraire* [25].

Scientific journals tend to be called *archival* journals. It refers to an important characteristic of journals. Journals record complete papers that are thoroughly refereed (or should be), revised and revised again. They satisfy *Visib* with (some) delay.

However, the emphasis on archiving also sets journals apart as *not where you have to be for the latest developments* and synonymous to *refereeing without time bounds* (despite increasing effort to keep it in bounds). Journals generally don't satisfy *Access-q*. Is this why conference publishing steadily remains the number one choice in our field?

Conferences

Conferences inform about latest results and bring fellow researchers together. They satisfy *Access-q* and most likely *Access-y*. Do they always satisfy the other criteria?

Proceedings offer what journals generally don't: quick refereeing (*Ref-q*) and a quick time-to-publication (*Access-q*). Even though refereeing may be shallow and content limited to essence only due to strict *page limits* [11], conference publications tend to be in high regard. They may lag behind on criteria *Verif* and *Reprod*, but this is taken for granted: the full paper can normally be found on the web well before the conference is held. It's the acceptance that counts, the more so if the conference is *competitive*, with a low 'acceptance ratio'.

Conference deadlines stimulate, they make that things get done. 'Being accepted' in a sufficiently respected conference brings more recognition than articles in all but the most prestigious journals. Papers must have appeared in some form in a conference in order to be visible and count. The archival role of proceedings is secondary. This is good enough for active researchers in the field, but doubtful for the recording of science for later [12].

One may question whether conferences are primarily meant for publishing, rather than for informing on work in progress and meeting colleagues [10]. It seems the former has won, due to the great value put on *Ref-q* and *Access-q* on the one hand and the constraints on library budgets on the other. For those who can't attend (e.g. often those who don't have a paper in the conference themselves), the increasing practice of publishing slides and recordings of conference talks on the Web is a good way of coping and to make talks available widely.

It used to be implicit that conference papers were only extended abstracts and not final publications. Full versions would be submitted eventually, sometimes simultaneously, to special issues or other journals [20, 22]. This 'dual system' can lead to issues of 'dual (or: prior) publication' and 'self-plagiarism', which many journals have now regulated very strictly.

If journals admit full versions of previously published articles at all, they tend to insist now that the full article contains 'substantially more material' [4, 28]. This is often taken to mean 'at least 30% more content material' (see e.g. [3]), but it is not clear how this can be adequately measured and whether it is a uniform standard. The practice exists only because advance reporting and publishing of research still takes place at conferences.

Type	Ref-q	Ref-t	Access-q	Access-y	Verif	Reprod	Visib
Journals	-	++	-?	++	++	++	+?
Proceedings	++	+/-	++	++	+?	+?	++
e-Prints	n.a.	n.a.	++	+?	++	++	+?
???	++	++	++	++	++	++	++

Figure 1: Publication styles and characteristics.

Is all conference material worth recording in journals? It continues to be important, to referee full versions and archive them and ensure *Verif* and *Reprod*, whichever applies [17]. For intermediate reportings it may not be necessary, but how can one assess their scientific status if they are not published in a regular way?

Other publication outlets

It is becoming increasingly popular to post (‘publish’) manuscripts in *e-print archives* like <http://arxiv.org/>, <http://eccc.hpi-web.de/>, and <http://eprint.iacr.org/>.

People are beginning to prefer the arXiv over publishing in their local technical report series although there is basically little difference, except for greater visibility and the possibility of feedback and posting revisions. For active researchers the arXiv is beginning to take over the role of informing from conferences. This may be good for an active research community but is it desirable? A lot of material on e-Print servers is trusted, but not refereed and not checked.

Posting in an e-print archive is not the same as publishing but it is beginning to have some recognition. Postings in e-print servers are often *not* viewed as prior publications and posted articles can still be submitted to journals or conferences (as in [4]). However, some journals are more strict. *Science* states: *Distribution on the Internet may be considered prior publication and may compromise the originality of the paper as a submission to Science* [30]. Common CS journals and conferences seems to continue to tolerate it.

4 Where to send your paper?

A frequent question is what publication outlet one should choose for a paper. Typical criteria include quality, selectivity, chance of acceptance, ranking or prestige in the community, and impact, regardless the type of outlet [8, 18]. For conferences also location, ease of travel, cost, or simply the wish to attend play a role. The ‘nearest deadline’ often determines the choice.

Viewed more broadly, Figure 1 gives an overview of the characteristics per publication outlet. Publishing in proceedings seems perfectly fitted to the dynamics of our field. Indeed in many areas, publications aim very explicitly at current issues and questions. The high *Access-q* score of proceedings is essential. There is little or no need for *Ref-t* nor for *Access-y*.

It is hard for journals to compete with this. They have become invisible in libraries, take long to referee manuscripts, and don’t give authors a stage. In the long run we may have to reconsider, however.

The problem is not the *status quo*, but the recording of scientific advance in the longer run. Is the current publication culture sustainable? There are reasons to believe it is not.

Costs

Conferences are becoming increasingly expensive and their formats don't scale well (in papers and scientific area). The latter leads to ever more conferences and workshops to form, in new areas that come up and often quite appropriately so. We can't go to all of them and thus have to rely on the proceedings like we rely on journals. The difference disappears.

The process is quite like the forming of ever more different journals, to cope with the development of computer science and the growing publication needs. This has proved too much for many library budgets, spurring electronic and open-access publishing. Yet, and almost paradoxically, the costs for presenting a single paper at a conference can be as high as a year's subscription to a journal. Many meetings are relevant but one can't attend all of them anymore. What is the scenario for the future?

Access

The growth of CS publishing has led to several crises: conferences keep splitting off and library budgets cannot cope. Many dedicated conferences are a way for the research community to manage. It is a matter of principle that the scientific material from these meetings is openly accessible to the community and not hidden away behind *paywalls* of third parties. Interestingly, 'open access' has some way to go but is gaining ground.

In the meantime the archival role of the internet is pushing ahead. There is hardly a conference paper that isn't found on the Web, at an e-print server like the arXiv or on author homepages. This should not be regulated but embedded in a sensible publication culture.

Recording developments vs archiving

The view that proceedings record what's current and journals 'only' archive seems to prevail. It hasn't always been like this. Yet, the young researchers of today are very strongly aware that they have to publish in leading conferences in order to make steps in their career. Is this sustainable while budgets shrink? Are there alternatives?

Are conferences better for citations? Analyses of citation records indicate that this is not necessarily the case. Depending on the discipline, selected journals and conferences can both be quite competitive [26].

The future of journal publishing is widely discussed, e.g. in [7]. One aspect is that journals should bridge the divide between recording (in the sense of registering current advances as they happen) and archiving. If full papers are embraced as the way to document the advances of (most of) computer science research as I think it should, then journals should do so in a way that is competitive to conference publishing. Putting accepted papers that are to appear in future issues already on a public server is already one way in which many journals cope. Several publishers, like e.g. Springer [24], have recently created *Online First* publication services which make journal articles available and citeable using their *DOI*, before the paper is to appear "in print". Is it enough?

5 Some propositions

All publication outlets have their good uses. However, when it comes to documenting and archiving it seems we need a better balance. As computing community we should extend our journal tradition and make it stand the modern times sustainably.

New initiatives have been developing in the last few years that challenge the status quo and change it bottom-up while the discipline as a whole is contemplating its policies [6, 35]. Some moves forward seem desired.

Journals

Journal publishing has seen substantial innovations in the last few years. A good example is the online journal *PLoS ONE* [27], which quickly became widely recognized in its community. *PLoS ONE* introduced a new approach to acceptance and publishing format, and is open access by the simple formula: authors pay charges, and this pays for the free online access as well. Another example is Nature’s Scientific Reports [23].

The computing community should not lag behind. (Note that e.g. the online *Journal of Universal Computer Science* [16], which covers all of computer science, already introduced several innovations years ago. Other journals have innovated as well.)

- A. Publishing in journals should regain some of the dynamics of the field (as in any science), in the interest of adequately documenting the advances of our science and conforming to standard practice.
- B. The computing community should take steps to make A possible and attractive.

A means: issues appearing monthly or even bi-weekly, if the notion of issues is to be maintained at all, and open access (i.e. available online and free of charge to all scholars).

B entails several aspects: sound refereeing in no more than two-three months, and a quick time-to-publication afterwards.

Breaking the barriers involved in A and B seems needed to make progress on the issue. It is up to our community to take the lead if it wants to. Acceptance is prerequisite for success.

Note that e.g. the VLDB community [35] has been implementing changes in this direction already. Other communities have been innovating too, see [5].

Conferences

As long as there is no substantial move on “A” (in a specific community), conference publishing will continue to fill the need of rapid publishing. The scientific recognition and status brought about by publishing in good conferences is a substantial part of the current culture and not easily taken over by journals.

Yet, in the broader context of the sciences it often puts computer scientists at a disadvantage if they only have conference publications. It took years to get recognition for publications in LNCS (‘lecture notes’) or in LIPIcs [19] as if they were journal publications, but this recognition seems fading.

Greater clarity seems needed in the curious phenomenon of conferences as a publication outlet. Publications in many of our esteemed conferences are often seen as final, but in the spectrum from *extended abstracts* to (almost) *full papers* it is often left unspecified where a given paper fits. Also, the former are rather more like research announcements ahead of submission to a journal whereas the latter *should* perhaps be seen as publications as in a journal (aside from the limited refereeing) but they can no longer appear in a journal anymore due to the ‘prior publication’ policies of most journals nowadays (with exceptions occurring). It complicates the appreciation of *journal-quality* conferences outside of the immediate scope of a research community.

- C. Publishing in conferences should return to its original intention, namely of publishing extended abstracts (only).
- D. The computing community should take steps to make C possible and attractive.

C means: greater difference between conference and journal papers [9], easier overview, and avoidance of the prior publication issue. No one is impaired by this, as already now advance versions of full papers are often available on the arXiv or author homepages. Proceedings can remain cheaper for everyone.

D means: quick pathways to publish full versions.

The greater balance between journal and conference publishing is not proposed for the sake of balance, but for making publications count the way they should. Policies like ACM's can be helpful to keep a fluent interplay between the two types of outlet [2].

e-Prints

Posting e-prints on media like the arXiv is increasing. Many journals and conferences accept manuscripts that were posted on e-print servers prior to submission and don't regard them as prior publications. Consequently authors should realize that e-print postings are most likely *not* counted as publications by review committees either but seen as a claims, pre-publications and/or signs of advancement. The value of this is clearly high and should remain, but as a mechanism it may confuse. Will publications in *TinyToCS* [34] or *twittered announcements* of research findings count as claim of priority?

6 Afterthoughts

Is there really a problem? The discipline has fine journal and conferences and the system works! Why bother?

There are several reasons why change is needed: the non-sustainability of the conference system in the long run, and the continued greater value of (full) journal publications in careers and department evaluations. While the proliferation of conferences is a great and necessary phenomenon for the development of our field, the journal system has to keep pace with it by innovating its archival function. New publication models in some CS communities are already beginning to work on changes.

Whatever system we adhere to or changes we wish to promote, it seems that greater balance and clarity are needed. Culture shifts do not happen easily. They can happen only if they are triggered by sensible developments and accepted by peers [15].

We need a sequel to [25] to position computer science publishing anew in the overall domain of science publishing and scientometrics, to guide the assessment of publications and their impact in the Internet Age.

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