PUBLISHING PAPERS IN CS.PL

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PUBLISHING PAPERS is the main way to disseminate the knowledge that we accumulate through research in post-graduate education. The basics are simple: pick a venue, write up your idea, submit, receive reviews, rebut, and then cross thy fingers for the program committee verdict. Yet, there is more to the spiel and many of the rules are unwritten, and scarcely communicated. This note is supposed to make you, as a MSc/PhD student, aware of some of the mechanics of publishing papers at suitable venues for programming language research in computer science. Understanding the mechanics of publishing is useful to understand how the community evaluates the value of research papers—both your own, and the papers that you read. It may help you select what to read, and how to cite the work correctly.

Conference Publishing

In computer science, we primarily publish conference papers. Conference publishing is sometimes confusing for researchers from other fields who are used to journal publishing. In those fields, conference publishing has a lesser status and may be organized quite differently. Conferences in CS vary in status.[1] The status is a matter of reputation, depending, for example, on the esteem of the program committee (PC), quality of the reviews, typical acceptance rate, and attendance of the conference. Of course, these all depend on the topic: a typical PC of a given conference can be more qualified to judge a paper in area A, than in area B.

There are many conferences that accept programming language (PL) papers. Two groups of conferences that we commonly target are ETAPS conferences and SIGPLAN conferences. ETAPS is the *European Joint Conferences on Theory and Practice of Software* and organizes four conferences:

[1] There exist so-called conference *rankings* by various institutes. Although they have some significance in various formal processes, their use is discouraged because of their dubious status. Hence, we will not discuss these rankings here.

ESOP	European Symposium on Programming
FASE	Fundamental Approaches to Software Engineering
FOSSACS	Foundations of Software Science and Computation Structures
TACAS	Tools and Algorithms for the Construction and Analysis of Systems

SIGPLAN is the *Special Interest Group on Programming Languages*, which is an ACM organization that organizes conferences and workshops for PL research. There are quite a few, among which:

POPL	Principles of Programming Languages
PLDI	Programming Language Design and Implementation
OOPSLA	Object-oriented Programming, Systems, Languages, and Applications
ICFP	International Conference on Functional Programming
SLE	Software Language Engineering
PLMW	The Programming Languages Mentoring Workshop

Of those, the papers that appear in the conference POPL, PLDI, and OOPSLA are published in a gold open access journal called PACMPL, or *Proceedings of the ACM on Programming Languages*.

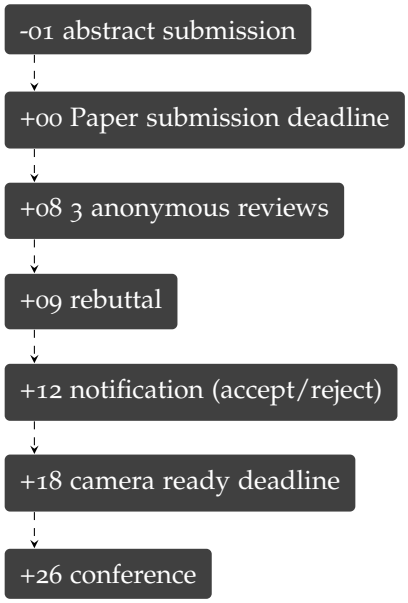
Both ETAP and SIGPLAN conferences are highly valued venues that are frequented by PL researchers from all over the world. They are probably the top targets for the PL group in Delft. There are many other conferences that one can consider. Worthy of mention is ECOOP (*European Conference on Object-Oriented Programming*), which is co-located with OOPSLA and SLE at the annual SPLASH conference (*Systems, Programming, Languages, and Applications: Software for Humanity*).

WE PUBLISH OUR WORK for a number of reasons: feedback, recognition, and knowledge dissemination. Recognition and dissemination depend to some extend to the "rating" of the venue. Publications at conferences with strict review process and low acceptance rate are extended more respect. It is, however, also more difficult to get a paper published there.[2] To get earlier feedback on work, one can turn to workshop publishing. This can be a great opportunity to get

[2] It is not uncommon for a paper to be submitted consecutively to three top conferences, going through major revisions every time.

some exposure for your own work, and to get exposed to other's work. Publishing early version of some research at a workshop often does not restrict one from publishing it later at a conference or in a journal.

The Process of Conference Publising



The timeline for a publication at one of the large conferences—e.g., POPL, ICFP, OOPLSA, ESOP—is roughly as shown in the margin, with the number of weeks relative to the submission deadline shown. The exact process varies from venue to venue, and is quite different from typical journal paper publishing. Most notably, the review cycle for a conference is faster, with a fixed number (1 or 2) of rounds of feedback. Typically there is only a single opportunity to make revisions. Those revisions happen after the notification for the camera ready deadline and receive only limited review, which means that the first submission of a paper to a conference needs to be of high quality, and must convince reviewers that the paper can be finalized with minor (read cosmetic) changes. Some conferences, like OOPSLA, are transitioning to a review process that leaves more room for revisions with two rounds of submissions. If the first submission is not good enough to be accepted, but the reviewers are confident that you can fix the issues before the second round submission deadline, then you will be allowed to resubmit. The benefit here is that you get the same reviewers, which will lend some continuity to the reviews.

Abstracts serve two functions in the review process. First, as always, they serve the purpose of giving your (potential) readers an idea of what is in the paper. Equally important to the review process, however, is the fact that they are often used in the paper bidding, if that is part of the internal process of the PC. That is, potential reviewers will bid on paper abstract that they would like to review. Hence, it is important to write abstracts that attract capable reviewers. If you write a paper whose technical sections use technique X extensively, you better mention X extensively in the abstract.

Although you will probably continue working on a topic after the submission (because work is never done), a submission should be

about the work that is already done. You should not make promises about technical artifacts or proven theorems in a paper submission that are not substantiated at the time of the submission. If the paper says that you have proven theorem X, you should have a closed proof of theorem X. If the paper says that you have a implementation that does Y, it better exists. Technically, papers can be retracted before the camera ready deadline, but doing so because you promised something that you could not deliver would be very bad form and could hurt your reputation among the program committee members.

The revision between the notification and the camera ready deadline is intended to be used to improve the explanation and presentation of results. The rebuttal is used to explain to the reviewers what revisions you intend to make and how these changes will address their concerns. If you can convince reviewers that there concerns are merely presentational and can indeed be fixed before the camera ready deadline, then they might adjust their judgment favorably.

Review Process

Reviewing for conference papers works roughly as follows. On the first day of the 'author response period' if any, or on the day of the 'notification' otherwise, a paper receives a number of (e.g., three) independent reviews. Reviews are called single-blind when the authors do not know the identity of the reviewers, and double-blind when the reverse is also the case. The reviews are independent because the reviewers do not communicate about the paper before the submit their reviews. A typical review has the following structure:

	OveMer	RevExp
Review #149A	A	X
Review #149B	B	Y
Review #149C	B	Y

- A judgment (e.g., (D) Strong reject, (C) Weak reject, (B) Weak accept, (A) Strong accept).
- A confidence value (e.g., (X) Expert, (Y) Knowledgeable, (Z) Some familiarity).
- A brief (neutral) summary of the paper.
- A summarizing list of strong and weak points of the paper.
- A list of typos/suggestions for improvement.
- A list of questions for the rebuttal.

Program committees attempt to organize reviews such that every paper receives at least one expert review. You will find that reviews

are sometimes unsatisfactory in that the reviewers may completely miss important points that you, the author, considered clearly stated. It is easy to become upset with the process, as evidenced by the frenzy on Twitter that usually follows immediately after reviews are released in the community. Although I am equally guilty of this, I would advise trying your best to oppose this tendency. First of all because it will be in your own best interest to try your utmost to understand the perspective of your reviewers and make the most of this feedback. Second of all because it will make you miserable if you allow yourself to dwell too much on the defects of the system.[3]

There is usually no hard rule which scores lead to an eventual accept/reject. The final judgment is determined in the program committee meeting with the reviews (possibly redacted based on the rebuttal) as input. It of course helps a lot if at least one reviewer is enthusiastic about the paper and will argue in the PC meeting that the paper should be included in the conference proceedings. Such a reviewer is called a 'champion'.[4]

When a conference has a rebuttal process, the authors are allowed to respond to the reviews with a letter.[5] The purpose of the letter may depend on the scores that the paper received. One may attempt to sway one of the reviewers that is on the brink, answer questions that the reviewers asked, promise improvements to the presentation, and/or ask further questions to get a better understanding of why a reviewer rejects the paper to aid in a future rewrite of the paper.[6]

The final decision on whether the paper will be included in the conference proceedings is taken in the centralized PC meeting. Besides the quality of your submission, other considerations might be in play. One factor can be a fixed maximum size of the conference proceedings. A hard limit on the number of accepted papers can raise the bar, but can also lead to seemingly random rejects.[7]

Post-Mortem

When a paper is *rejected*, one usually tries to find a new venue for an improved version of the same work. Sometimes it becomes apparent from reviews that the contributions will not easily be adjusted to be accepted in the proceedings of a top conference.

[3] Of course, there is a time and a place to consider those defects, but it is probably not when you have to respond to reviews.

[4] On the other hand we have the reviewer who last minute remembered that they had to write a review, barely read the introduction, and strongly objects against the whole perspective. This person is colloquially known as 'Reviewer 2'.

[5] Oftentimes the identities of the authors are revealed when the reviews are submitted, such that this part of the review process is only single-blind.

[6] Rebuttals often have quite strict word limits. We tend to write a short top-level response that fits in this limit and makes the main points we want to make, and respond separately to each comment and question by the reviewers.

[7] OOPSLA has recently abandoned the limit on the number of accepted papers.

Sometimes one finds that another audience might better understand the contributions. These considerations require some experience with paper submissions and with different conference audiences.

One thing one has to decide for a resubmission is to what extent the contributions need to be adjusted. Oftentimes reviewers suggest paths forward: an additional contribution, a different case study, an additional section explaining some point, shifting emphasis, etc. It is sometimes tempting to take such a suggestion as bug reports and to start 'fixing the remaining issues'. Consider carefully, however, that a resubmission will likely be judged by completely different reviewers with different predispositions. You—the authors—should take charge of the research design. Consider not just whether the work that you will carry out in response to the reject will get your work accepted eventually, but also if it takes your research in an interesting direction, unearthing valuable knowledge. Work tends to multiply once you start on something and a resubmission can easily take half a year, if not more. Choose your path forward consciously. A good mental exercise is to perform a *pre-mortem*: *if* I do this work in the next six months, resubmit, and receive another reject, what could have been the reason? Will I regret the work I have done to get to the resubmission?

Publishing an Accepted Paper

When a paper is *accepted*, there is still work to be done. Typically, papers are accepted *conditionally*—i.e., based on the premise that the authors will fix a number of issues pointed out by the referees. These conditions are rarely guarded by formal process, but some conference appoint 'shepherds' that need to sign off on the final manuscript and guide authors to the final version. In any case, reviewers usually give a paragraph along with the verdict to indicate what they expect of the final version. Besides the required changes, one usually has a number of things to work on to improve the paper—e.g., layout, adding figures and tables, fixing typos, and finalizing artifacts. There are usually a few weeks between the notification and the so-called 'camera-ready deadline'[8].

Before the camera-ready submission becomes part of the conference proceedings, it gets reviewed by the publisher. Such a review is quite superficial and only pertains to the visual appearance and publisher's formal requirements of the paper. They will check, for

[8] The term 'camera ready' stems from time that manuscripts where photographed to produce the plates used in the offset printing process.

example, if author names are presented consistently, if titles are capitalized as required, whether all fonts are embedded in the PDF, and if your pages have no orphan/widow sentences.[9]

It is not entirely trivial to make sure that your last minute changes converge on something that is consistent and checks all the boxes. It is useful to maintain a checklist of things that need to be checked on the final submission. A tool that can help verify that no unwanted changes are introduced is `diffpdf`. This tool can check and highlight both textual differences and visual differences between two PDFs.

[9] The requirements are called 'author instructions' and are typically shared with authors by e-mail as part of the publishing procedure. Some instructions are checked automatically as part of the submission process. An example may be available here.