Guidelines for Writing Technical Paper

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Abstract:

The abstract must **not** contain references, as it may be used without the main article. It is acceptable, although not common, to identify work by author, abbreviation or RFC number. (For example, "Our algorithm is based upon the work by Smith and Wesson.").Avoid use of "in this paper" in the abstract. What other paper would you be talking about here? Avoid general motivation in the abstract. You do not have to justify the importance of the Internet or explain what QoS is. Highlight not just the problem, but also the principal results. Many people read abstracts and then decide whether to bother with the rest of the paper. Since the abstract will be used by search engines, be sure that terms that identify your work are found there. In particular, the name of any protocol or system developed and the general area ("quality of service", "protocol verification", "service creation environment") should be contained in the abstract. Avoid equations and math. Exceptions: Your paper proposes $E = m c^2$.

Index term: ***Technical Paper, Tips for writing paper***

1. Introduction

Avoid stock and cliché phrases such as "recent advances in XYZ" or anything alluding to the growth of the Internet. Be sure that the introduction lets the reader know what this paper is about, not just how important your general area of research is. Readers won't stick with you for three pages to find out what you are talking about.

The introduction must motivate your work by pinpointing the problem you are addressing and then give an overview of your approach and/or contributions (and perhaps even a general description of your results). In this way, the intro sets up my expectations for the rest of your paper -- it provides the context, and a preview. **Repeating the abstract in the introduction is a waste of space.** Example bad introduction: Here at the institute for Electronics and Telecomm research, me and my colleagues have created the SUPERGP system and have applied it to several toy problems. We had previously fumbled with earlier versions of SUPERGPSYSTEM for a while. This system allows the programmer to easily try lots of parameters, and problems, but incorporates a special constraint system for parameter settings and LISP S-expression parenthesis counting. The search space of GP is large and many things we are thinking about putting into the supergpsystem will make this space much more colorful.

A pretty good introduction, drawn from Eric Siegel's class: Many new domains for genetic programming require evolved programs to be executed for longer amounts of time. For example, it is beneficial to give evolved programs direct access to low-level data arrays, as in some approaches to signal processing \cite{teller5}, and protein segment classification \cite{handley, koza6}. This type of system automatically performs more problem-specific engineering than a system that accesses highly preprocessed data. However, evolved

programs may require more time to execute, since they are solving a harder task.

2. Previous or obvious approach overview:

The following section surveys related work in both optimizing the execution time of evolved programs and evolution over Turing-complete representations. Next we introduce the game Tetris as a test problem. This is followed by a description of the aggregate computation time ceiling, and its application to Tetris in particular. We then present experimental results, discuss other current efforts with Tetris, and end with conclusions and future work.Give the paper to somebody else to read. If you can, find two people: one person familiar with the technical matter, another only generally familiar with the area. Papers can be divided roughly into two categories, namely original research papers and survey papers. There are papers that combine the two elements, but most publication venues either only accept one or the other type or require the author to identify whether the paper should be evaluated as a research contribution or a survey paper. A good research paper has a clear statement of the problem the paper is addressing, the proposed solution(s), and results achieved. It describes clearly what has been done before on the problem, and what is new. The goal of a paper is to describe novel technical results. There are four types of technical results:

An algorithm: **A system construct:** such as hardware design, software system, protocol, etc.; **A performance evaluation:** obtained through analyses, simulation or measurements; **A theory:** consisting of a collection of theorems. A paper should focus on: describing the results in sufficient details to establish their validity; identifying the novel aspects of the results, i.e., what new knowledge is reported and what makes it non-obvious; Identifying the significance of the results: what improvements and impact do they suggest.

3. Paper Structure:

Typical outline of a paper is: Abstract, typically not more than 100-150 words; Introduction (brief!): introduce problem, outline solution; the statement of the problem should include a clear statement why the problem is important (or interesting).

Related Work (or before summary). Hint: In the case of a conference, make sure to cite the work of the PC co-chairs and as many other PC members as are remotely plausible, as well as from anything relevant from the previous two proceedings. In the case of a journal or magazine, cite anything relevant from last 2-3 years or so volumes.

Outline of the rest of the paper: "The remainder of the paper is organized as follows. In Section 2, we introduce ..Section 3 describes ... Finally, we describe future work in Section 5." [Note that Section is capitalized. Also, vary your expression between "section" being the subject of the sentence, as in "Section 2 discusses ..." and "In Section, we discuss ...".]

Body of paper, problem, approach, architecture, results, Related work, if not done at the beginning, Summary and Future Work, often repeats the main result, Acknowledgements, References.

References:

Avoid use of *et al.* in a bibliography unless list is very long (five or more authors). The author subsumed into *et al.* may be your advisor or the reviewer... Note punctuation of *et al.*.

Internet drafts must be marked ``work in progress''. Make sure that they have been replaced by newer versions.

Book citations include publication years, but no ISBN number.

It is now acceptable to include URL to material, but it is probably bad form to include a URL pointing to the author's web page for papers published in IEEE publications.Leave a space between first names and last name, i.e., "J. P. Doe", not "J.P.Doe".