

How to Write an Abstract

Abstract

Because on-line search databases typically contain only abstracts, it is vital to write a complete but concise description to entice potential readers into obtaining a copy of the full paper. Writers should follow a checklist consisting of: motivation, problem statement, approach, results, and conclusions. Following this checklist should increase the chance of people taking the time to obtain and read the complete paper.

Introduction

Now that the use of on-line publication databases is prevalent, writing a really good abstract has become even more important. Abstracts have always served the function of "selling" the paper. But now, instead of merely convincing the reader to keep reading the rest of the attached paper, an abstract must convince the reader of the benefit of a paper.

Checklist: Parts of an Abstract

Despite the fact that an abstract is brief, it must do almost as much work as the multi-page paper that follows it. It should include the following sections; each section is typically a single sentence. The parts may be merged or spread among a set of sentences. Use the following as a checklist for the abstract:

- **Motivation:**

Why do we care about the problem and the results? If the problem isn't obviously "interesting" it might be better to put motivation first; but if the subject matter is incremental progress on a problem that is widely recognized as important, then it is better to put the problem statement first to indicate which piece of the larger problem the paper addresses. This section should include the importance of the paper, the difficulty of the area, and the impact it might have if successful.

- **Problem statement:**

What problem are you trying to solve? What is the *scope* of the paper (a generalized approach, or for a specific situation)? Be careful not to use too much jargon. In some cases it is appropriate to put the problem statement before the motivation, but usually this only works if most readers already understand why the problem is important.

- **Approach:**

How do you go about solving or making progress on the problem? Do you use simulation, analytic models, prototype construction, or analysis of field data? What was the extent of the work (does it cover one application or universal application?) What important variables do you control, ignore, or measure?

- **Results:**

What's the answer? Specifically, most good papers conclude that something is so many percent faster, cheaper, higher quality, or otherwise better than something else. Put the result in numbers if possible. Avoid vague, hand-waving results such as "very", "small", or "significant." If you must be vague, you are only given license to do so when you can talk about orders-of-magnitude improvement. There is a tension here in that you should not provide numbers that can be easily misinterpreted, but on the other hand you don't have room for all the caveats.

- **Conclusions:**

What are the implications of the answer? Is it going to be a game changer, be a significant "win", or simply serve as a road sign indicating that this path is a waste of time (all of the previous results are useful)? Are the results general, potentially generalizable, or specific to a particular case?

Other Considerations

An abstract must be a fully self-contained, capsule description of the paper. It can't assume (or attempt to provoke) the reader into flipping through looking for an explanation of what is meant by some vague statement. It must make sense all by itself. Some points to consider include:

- An abstract typically has a word limit of 150 to 200 words. Be accurate yet concise when writing the abstract.
- Think of five keywords that people looking for this paper might use. Keywords are used to facilitate keyword index searches. Be sure that those exact keywords appear in your abstract, so that they will turn up at the top of a search result listing. Look for keywords consistent with the SMRP Maintenance & Reliability Body of Knowledge pillars. Keywords should be ranked in order of importance or relevance.