How to write an introduction: some suggestions

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Preface

For a change, something I've written for my students. I hope it can be useful.

Introduction

The introduction is certainly the most read section of any deliverable, and it largely determines the attitude of the reader/reviewer will have toward the work. Therefore, it is probably the most delicate part of the writing of a report.

Unfortunately, many people (even very experienced ones) seem to have difficulties at writing a good introduction. For some, it is a daunting task.

In this short article, I present a very simple method for writing a good introductory chapter. Actually, the core of this method was taught to me (10 years ago) by Krzysztof Apt. At that time, it surprised me in its simplicity and efficiency. In ten years, I have been happily applying it to all introductions I have written.

Of course, I am not the first one coming up with such a recipe: a necessarily incomplete list of links to articles about scientific writing is reported in the last section.

A Recipe for Writing an Introduction

An Introduction should contain the following three parts:

1. Background.
   In this part you have to make clear what the context is. Ideally, you should give an idea of the state-of-the art of the field the report is about. But keep it short: in my opinion this part should be less than a page long. Half a page should suffice in case of a normal 15-pages article.
2. The Problem.
   If there was no problem, there would be no reason for writing a report, and definitely no reason for reading it. So, please tell the reviewer why she should proceed reading. A simple sentence like "So far no-one has investigated the link..." or "The above-mentioned solutions don't apply to the case ...", can sometimes be enough to clarify the point you want to get at. Experience shows that for this part a few lines are often sufficient.
3. The Proposed Solution.
   Now - and only now! - you may outline the contribution of the report. Here you have to make sure you point out what are the novel aspects of your work. There are probably a zillion articles out there on that very subject: you can't expect the reviewer to know them all; so make his life easier and clearly highlight what is the difference between your method and the others. You can take your time here, but I suggest to avoid getting into too much detail.

In addition there can be the following optional ingredients:

4. Related work

My suggestion is to postpone this part to the end of the paper, unless there are good reasons for doing otherwise. For instance, one good reason for not following this suggestion is the presence in the literature of a very prominent related work, in which case you might want to give immediately an idea of what are the differences between your work and the prominent one. In general, though, I find it much easier to have a related works section at the end of the report: one reads it when he has already a good idea of the technical contribution. In this case, include in the introduction a line saying "Related works are discussed in Section ...".

5. An anticipation of the conclusions
   This is very difficult to do properly. I think that this part should be there only in reports that have a strong position-statement nature. If you decide to include this into the introduction, you might want to (a) keep it as short as possible, (b) refer as much as possible to the concluding section, and (c) keep it well separated from the rest of the introduction.
6. The outline (plan of the paper)
   Personally, I find it useful only for long reports, otherwise I think it is a waste of paper. But this is my very personal opinion.

Two Extra Tips

Keep the parts well separated.
   Personally, there are only very few things that I find more irritating than an introduction in which parts 1&2&3 are not clearly separated from each other. Use "itemize", if possible: it helps.

Keep it short.
   Unless you know you can write well.

Links

There are many resources on the matter. In particular there is an excellent website maintained by Toby Walsh with loads of links on on scientific writing, on presenting scientific articles, etc. **http://www-users.cs.york.ac.uk/~tw/phd/**

My favourite links:

- How to have your abstract rejected, by Mary-Claire van Leunen and Richard Lipton. **http://www.acm.org/sigplan/conferences/author-info/vanLeunenLipton.html**
- Author Information for ACM SIGPLAN Conferences **http://www.acm.org/sigplan/conferences/author-info/**

Other links I found:

- How NOT to write a paper. by Oded Goldreich. **http://www.wisdom.weizmann.ac.il/~oded/writing.html**
- How to Write A Paper in Scientific Journal Style and Format, by Greg Anderson. **http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtoc.html**
- How to Write a Scientific Paper, by E. Robert Schulman **http://members.verizon.net/~vze3fs8i/air/airpaper.html**.