LaTeX tips and tricks

Chris Mitchell
www.isg.rhul.ac.uk/~cjm
0. Introduction

• Purpose:
  – to help you improve your use of LaTeX, an invaluable tool for writing academic papers and theses.

• Need:
  – as a PhD supervisor and referee of many papers, I constantly see LaTeX being poorly used, which creates a very bad impression of the author’s competence.
Obvious but …

• First and foremost, as with any system the ‘Junk in ... junk out’ rule applies.

• This especially applies to BibTeX files, where I see an awful lot of junk!

• More generally, LaTeX is incredibly simple to use – but it is worth spending just a few minutes learning how to use it properly.

• To a referee, the initial impression of a paper is incredibly important.
A fundamental precept I

• Above all else, **wherever possible use the LaTeX defaults**, including using the article style (until the point at which you need to use a special style, e.g. as required by a journal or conference).

• I recommend using 11pt, as a compromise between readability and not ‘shouting’.

• It is almost certainly the case that LaTeX knows better than you about how to lay out a paper.
A fundamental precept II

• Of course, occasionally it is necessary to make LaTeX do something it doesn’t want to, but in my experience these are rare events.

• Three particular bugbears:
  – don’t fiddle with the margins to get more text on the page – it makes the paper hard to read;
  – minimise your use of packages – they just make it harder to reformat your paper for a journal or proceedings;
  – almost never use `\` for a forced new line.
1. Errors in TeX processing

• When you process your LaTeX file to get a .dvi, .ps or .pdf file, LaTeX will generate a .log file (a text file).

• It is **important that you look at this**, since it will record errors and warnings.

• Although you can probably ignore warnings whilst you are preparing a paper, it is important to resolve them before sending the paper for review.
Overfull hboxes

• Perhaps the most common source of warnings is the ‘overfull \hbox’.

• This simply means that LaTeX cannot find a way to divide up the text to avoid text going into the margin.

• This is easily fixed – just reword your text slightly, and the problem will go away.

• However, don’t ignore them – they make your work look messy.
Undefined or multiply defined labels

• I hope you all use labels to enable cross-references to section numbers and references to figure or table numbers to be automatically updated.
• If you don’t – then you should start!
• However, it is not uncommon for labels to be mistyped or left out, or even for the same label to be used twice.
• Clearly LaTeX will generate errors – usually resulting in ‘??’ occurring in your paper.
• It is simply not acceptable for you to leave these in for reviewers to discover – check the .log file!
BibTeX errors

• Another common source of errors is citations.
• Papers can be cited that are not present in your BibTeX file or at the end of your LaTeX source file.
• This will give more occurrences of ‘??’.
• Check your .log file and root these out!
• BibTeX also generates a log file – of type .blg – don’t forget to check this too!
• I get really cross when I am asked to read stuff which the authors have made no effort to check for errors.
2. Internal cross-references

- I already referred to the use of labels.
- Include a `\label{useful-name}` after a section heading, so that you can refer to this section heading using the syntax: `\ref{useful-name}`.
- Include a `\label{...}` after the `\caption{...}` in a figure or table environment so that you can refer to the number of the figure or table (again using `\ref{...}`).

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Advantages of using labels

• It is tempting not to use labels and simply to hard-code cross-references and references to figure and table numbers – just to save a few seconds.

• Please don’t.

• If you hard code cross-references, you will almost certainly forget to update some of them when the section numbers change.
3. Bibliographies

• This is perhaps the area that gets me most worked up when reading papers as a referee.

• In general, the standard of bibliographies is appallingly low.

• There is no excuse for this – once you have typed a correct entry into a .bib file, you never need to type it again!
Above all else – use BibTeX

• BibTeX is a great tool, which makes generating bibliographies much easier.
• There is an initial investment, but this pays off quickly, since you can use the same file with every paper/thesis you write.
• I created a .bib file 20 years ago, and it has been growing ever since ...
Use the right entry types

• Use the entry type which matches the type of paper or book you are referring to, e.g.:
  – article (paper in a journal)
  – book
  – inbook (part of a single author book)
  – incollection (a chapter of an edited book)
  – inproceedings (paper in a conference proceedings)
  – manual (I use this for standards)
  – misc (use when nothing else fits)
  – techreport
  – unpublished
Fill out the fields properly

• Each entry type has a different set of ‘required’ and ‘optional’ fields.
• Fill out all the required fields!
• Get author names laid out correctly (beware multi-part last names).
Don’t misuse fields (unless you really have to)

• In particular, don’t put the name of a company or organisation in the ‘author’ field.

• Author names are laid out in a special way by BibTeX style files.

• Also, BibTeX will sort entries by the author last name, i.e. if you put ‘United Nations’ in an author field, then BibTeX will sort it under ‘Nations’.
Don’t import dodgy .bib entries

• It is often tempting to use a .bib entry taken from the web.
• Sometimes these are fine – however, often they are full of errors.
• For example, I don’t think I have ever seen a Citeseer .bib entry which was correct and complete.
Tools don’t solve all problems

• There are a range of tools which are designed to make creating .bib entries easier, such as jabref.
• By all means use such tools, although, as always, ‘junk in – junk out’ applies.
• I am also concerned that, through over-reliance of the tool, when problems occur it is not so obvious how to fix them.
• It is worth spending 15 minutes learning what .bib entries ought to look like – see:

  http://www.isg.rhul.ac.uk/~cjm/BTXDOC.pdf
4. Some small points

• There are a number of relatively minor points of detail when using LaTeX.
• Getting them wrong will make the LaTeX pedant shudder (and who knows – the referee for your paper may be just such a pedant, e.g. me).
• Getting them right is easy – just rtfm ...
Inter-sentence spaces

• It is a standard convention when typesetting English to leave a slightly larger space than usual after the end of a sentence.
• LaTeX does this automatically.
• However, sometimes it gets it wrong.
• LaTeX uses the following simple rule:
  – leave an end of sentence space after a full stop unless the full stop is preceded by a capital letter.
Inserting an end of sentence space

• Sometimes LaTeX thinks that the full stop at the end of a sentence is a marker for an abbreviation – and it does not leave an end of sentence space.
• This happens if the last word is an acronym, e.g. ‘RHUL’.
• In such a case use the `\@` syntax just before the full stop, e.g. change:
  ‘... at RHUL. We ...’
to
  ‘... at RHUL\@. We ...’
Removing an end of sentence space

- Sometimes LaTeX thinks that the full stop after an abbreviation marks the end of a sentence and leaves an extra large space.
- This happens whenever you write ‘e.g.’, ‘etc.’ or ‘i.e.’.
- To fix this insert a backslash, e.g. change ‘... etc. and’ to ‘... etc.\ and ...’.
Section numbering

• This is not strictly a LaTeX issue but ...
• If you have a section numbered 2.3.1, there should (at least) be a section 2.3.2.
• If you want to have a single sub-heading within a section, then remove the number, i.e. using `\subsection*{...}` or `\subsubsection*{...}`, which give unnumbered versions of the normal section headings.
Resources

• There are a huge number of useful LaTeX resources out there on the web.
• I maintain a small list of links at:
  http://www.isg.rhul.ac.uk/~cjм/Chris_Mitchell.htm#LaTeX
• There are also a number of local LaTeX experts, notably Jason Crampton and Adrian Johnstone (HoD of Computer Science, who has written a book on LaTeX).