# LaTeX tips and tricks

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# 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{...}`).

# 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/~cjm/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).