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Robotica: LaTeXGuidelines for authors

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Abstract

This guide is for authors who are preparing papers for the *Robotica* journal using the LaTeX document preparation system and the CUP ROB style file.

1. Introduction

The layout design for the *Robotica* journal has been implemented as a LaTeX style file. The ROB style file is based on the ARTICLE style as discussed in the LaTeX manual. Commands which differ from the standard LaTeX interface, or which are provided in addition to the standard interface, are explained in this guide. This guide is not a substitute for the LaTeX manual itself.

1.1. Introduction to LaTeX

The LaTeX[1] document preparation system is a special version of the TeX typesetting program. LaTeX adds to TeX a collection of commands which simplify typesetting by allowing the author to concentrate on the logical structure of the document rather than its visual layout.

LaTeX provides a consistent and comprehensive document preparation interface. There are simple-to-use commands for generating a table of contents, lists of figures and/or tables, and indexes. LaTeX can automatically number list entries, equations, figures, tables, and footnotes, as well as parts, chapters, sections and subsections. Using this numbering system, bibliographic citations, page references and cross references to any other numbered entity (*e.g.* chapter, section, equation, figure, list entry) are quite straightforward.

1.2. The ROB document class

The use of document class allows a simple change of style (or style option like if DTMColor is removed from `\documentclass` then the layout will be in B/W) to transform the appearance of your document. The CUP ROB class file preserves the standard LaTeX interface such that any document which can be produced using the standard LaTeX ARTICLE style can also be produced with the ROB style. However,

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[1]To know more information about LaTeX and its packages, try https://ctan.org/?lang=en

the fonts (sizes) and measure of text is slightly different from that for ARTICLE, therefore line breaks will change and it is possible that equations may need re-setting.

2. Additional facilities

In addition to all the standard LaTeX design elements, the ROB style includes the following feature:

- Extended commands for specifying a short version of the title and author(s) for the running headlines.

Once you have used this additional facility in your document, do not process it with a standard LaTeX style file.

2.1. Titles authors' names and affiliation

In the ROB style, the title of the article and the author's name (or authors' names) are used both at the beginning of the article for the main title and throughout the article as running headlines at the top of every page. The title is used on odd-numbered pages (rectos) and the author's name appears on even-numbered pages (versos). Although the main heading can run to several lines of text, the running head line must be a single line.

Moreover, the main heading can also incorporate new line commands (*e.g.* \\) but these are not acceptable in a running headline. To enable you to specify an alternative short title and author's name, the standard `\authormark` command have been used to print the author running headline. If more authors has to be used in `\author` command then each authors should be captured in separate `\author` command. `\address` command is used to call the affiliation, if more affiliations has to be used in `\address` command then each affiliations should be captured in separate `\address` command. The author and affiliation indicator should be catptured with an option argument in `\author` and `\address` command such as `\author[..]` and `\address[..]`. The `\email` command should be used inside the affiliation:

```
\authormark{Cambridge Authors}
\title{The full title which can be as long as necessary}
\author{Author's name}
\address{the affiliation if necessary\email{email}}
```

2.2. Abstract

The ROB style provides for an abstract which is produced by the following commands

```
\begin{abstract}  ...  \end{abstract}
```

2.3. Lists

The ROB style provides the three standard list environments.

- Bulleted lists, created using the `itemize` environment.
- Numbered lists, created using the `enumerate` environment.
- Labelled lists, created using the `description` environment.

2.4. Footnotes

The ROB journal style uses superior numbers for footnote references.[2]

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[2]This shows how a footnote is typeset.

3. Some guidelines for using standard facilities

The following notes may help you achieve the best effects with the ROB style file.

3.1. Sections

LaTeX provides five levels of section headings and they are all defined in the ROB style file:

- `\section`.
- `\subsection`.
- `\subsubsection`.
- `\paragraph`.
- `\subparagraph`.

Section numbers are given for sections, subsection and subsubsection headings.

3.2. Running headlines

As described above, the author's name (or author's names) should be used as running headline at the top of every page. The journal title is used on odd-numbered pages (rectos) and the author's name appears on even-numbered pages (versos).

The `\pagestyle` and `\thispagestyle` commands should *not* be used. Similarly, the commands `\markright` and `\markboth` should not be necessary.

3.3. Tables

The `figure` and `table` environments are implemented as described in the LaTeX Manual to provide consecutively numbered floating inserts for illustrations and tables respectively. The standard inserts and their captions are formatted centred. Line breaks in captions can be inserted as required using \\.

The ROB style file will cope with most positioning of your tables and you should not normally use the optional positional qualifiers on the `table` environment which would override these decisions. Normal journal style sets the table caption first, followed by a double rule, the table body and a double rule at the bottom. Single rules and spanner rules (`\cline`) can be used to separate headings from the columns. For example, Table 1 is produced using the following commands:

```
\begin{table}
  \TBL{\caption{Results of Overloading for 3 Experimental Setups\label{sample-table}}}
  {\begin{fntable}\centering
    \begin{tabular}{@{\extracolsep{\fill}}lcrrrrr}
    \hline
    Program& Expt.&CPU&RelCPU&GC& Mem&RelMem\\
    \hline
    8 Queens& (a)&   2 88&  1 00&    6&   1 7M&  1 00\\
    &         (b)&  32 51& 11 29&  193&  48 9M& 28 76\\
    &         (c)&   7 90&  2 74&   42&  11 3M&  6 65\\
    Primes&   (a)&   4 89&  1 00&   19&   5 3M&  1 00\\
    &         (b)&  47 54&  9 72&  204&  54 5M& 10 28\\
    &         (c)&  10 08&  2 06&   47&  13 0M&  2 45\\
    Nfib&     (a)&  21 65&  1 00&  161&  40 4M&  1 00\\
    &         (b)& 221 65& 10 24& 1382& 349 0M&  8 64\\
    &         (c)&  21 30&  0 98&  161&  42 0M&  1 03\\
    \hline
    \end{tabular}
  \end{fntable}}}
\end{table}
```

Notice the use of the macro to obtain the centered decimal points, inside the body of the table.

Table 1. *Results of Overloading for 3 Experimental Setups.*

Program	Expt.	CPU	RelCPU	GC	Mem	RelMem
8 Queens	(a)	2 88	1 00	6	1 7M	1 00
	(b)	32 51	11 29	193	48 9M	28 76
	(c)	7 90	2 74	42	11 3M	6 65
Primes	(a)	4 89	1 00	19	5 3M	1 00
	(b)	47 54	9 72	204	54 5M	10 28
	(c)	10 08	2 06	47	13 0M	2 45
Nfib	(a)	21 65	1 00	161	40 4M	1 00
	(b)	221 65	10 24	1382	349 0M	8 64
	(c)	21 30	0 98	161	42 0M	1 03

Figure 1. *An example figure with space for artwork..*

The `tabular` environment should be used to produce ruled tables; it has been modified for the ROB style in the following ways:

1. Additional vertical space is inserted above and below a horizontal rule (produced by `\hline`);

Because of this reformatting, vertical rules should not be used; furthermore, commands to redefine quantities such as `\arraystretch` should be omitted. If the old tabular facilities are needed, there is a new environment, `oldtabular`, which has none of the reformatting; it should be used in exactly the same way.

3.4. Illustrations (or figures)

The ROB style will cope with most positioning of your illustrations and you should not normally use the optional positional qualifiers on the `figure` environment which would override these decisions. Figure captions should be below the figure itself, therefore the `\caption` command should appear after the figure or space left for an illustration.

Figure 1 shows an example onw working with LaTeX code to load art files. `\includegraphics` commnad is to load art files `scale` option used in `\includegraphics` is to reduce the art. EPS format will be compiled using LaTeX. PNG, PDF and JPG format art files are loaded in the same command but the TeX file should be compiled using PDFLaTeX:

```
\begin{figure}
  \includegraphics[scale=.4]{sample.eps}
  \caption{An example figure with space for artwork.}
  \label{sample-figure}
\end{figure}
```

The vertical depth should correspond roughly to the artwork you will submit; it will be adjusted to fit the final artwork exactly.

3.5. Creating new theorem-like environments

You can create your own environments in LATEX, and although you may already be familiar with \newtheorem, you will not have seen the other two commands explained below.

\newtheorem is a standard command used for creating new theorem-like environments, such as theorems, corollaries, lemmas, conjectures and propositions, with the body of the text (automatically) in italic.

4. Mathematics

The ROB class file will centre displayed mathematics, and will insert the correct space above and below if standard LATEX commands are used; for example use \[... \] and *not* $$ ... $$. Do not leave blank lines above and below displayed equations unless a new paragraph is really intended.

amsmath.sty is common package to handle various type math equations. The amsmath descriptions are available in the document can be find in the web link https://ctan.org/pkg/amsmath?lang=en

4.1. Numbering of equations

The subequations and subeqnarray environments have been incorporated into the ROB class file (see Section 4.1.1 regarding the subequations environment). Using these two environments, you can number your equations (1a), (1b) etc. automatically. For example, you can typeset

$$a_1 \equiv (2\Omega M^2/x)^{\frac{1}{4}} y^{\frac{1}{2}} \tag{1a}$$

and

$$a_2 \equiv (x/2\Omega)^{\frac{1}{2}} k_y/M. \tag{1b}$$

by using the subequations environment as follows:

```
\begin{subequations}
\begin{equation}
  a_1 \equiv (2\Omega M^2/x)^{\textstyle\frac{1}{4}}
    y^{\textstyle\frac{1}{2}}\label{a1}
\end{equation}
and
\begin{equation}
  a_2 \equiv (x/2\Omega)^{\textstyle\frac{1}{2}}k_y/M.\label{a2}
\end{equation}
\end{subequations}
```

4.1.1. The subequations environment and the AMSTEX package

The amstex (and the amsmath) packages also define a subequations environment. The environment in ROB.cls is used by default, as the environments in the AMS packages don't produce the correct style of output.

Note that the subequations environment from the amstex package takes an argument – you should use an 'a' to give \alph style subequations. e.g.

```
\begin{subequations}{a}  ...  \end{subequations}
```

4.2. Bibliography

As with standard LaTeX, there are two ways of producing a bibliography; either by compiling a list of references by hand (using a `thebibliography` environment), or by using BibTeX with a suitable bibliographic database for example sample.bib with the bibliography style provided with the ROB-New-Guide.tex like `\bibliographystyle{roblike}`. The roblike.bst will produce the bibliography which is similar to rob style but not exactly. If any modification has to be made with roblike.bst can be adjusted during manuscript preparation but the updated bst file should be given with source files. However, contributors are encouraged to format their list of references style outlined in section 4.2.2 below.

4.2.1. References in the text

References in the text are given by reference number. Whichever method is used to produce the bibliography, the references in the text are done in the same way. Each bibliographical entry has a key, which is assigned by the author and used to refer to that entry in the text. There is one form of citation – `\cite{key}` – to produce the reference number. Thus, [4] is produced by

`\cite{JOE.2000}`.

`natbib.sty` is common package to handle various reference and its cross citations. The natbib descriptions are available in the document can be find in the web link `https://ctan.org/pkg/natbib?lang=en`

4.2.2. List of references

The following listing shows some references prepared in the style of the journal.

```
\begin{thebibliography}{99}
\bibitem{Antonelli-SpingerBook2013}
G. Antonelli, {\it Underwater Robots}, vol. 96. Springer Tracts in Advanced
Robotics (Springer International Publishing, Switzerland, 2014).
\bibitem{Fossen2011handbook}
T. I. Fossen, {\it Handbook of Marine Craft Hydrodynamics and Motion Control}
(John Wiley \& Sons, Ltd., United Kingdom, 2011).
\bibitem{deBarros_JOE2019}
P. Cardenas and E. A. de Barros, ``Estimation of AUV hydrodynamic coefficients
using analytical and system identification approaches,'' {\it IEEE J. Ocean.
Eng.}, 1--20 (2019). 10.1109/JOE.2019.2930421
\bibitem{JOE.2000}
M. Caccia, G. Indiveri and G. Veruggio, ``Modelling and identification of
open-frame variable configuration unmanned underwater vehicles,'' {\it IEEE J.
Ocean. Eng.} \textbf{5}, 227--240 (2000).
\bibitem{peng2018path}
Z. Peng, J. Wang and Q.-L. Han, ``Path-following control of autonomous underwater
vehicles subject to velocity and input constraints via neurodynamic optimization,''
{\it IEEE Trans. Ind. Electron.} \textbf{66}(11), 8724--8732 (2018).
\end{thebibliography}
```

4.3. Catchline and date commands

To be placed in the preamble; for example:

- `\jyear{2021}`
- `\jdoi{10.1017/xxxxx}`
- `\jnlPage{1}{8}`
- `\received{xx xxx xxx}\revised{xx xxx xxx}\accepted{xx xxx xxx}`

Author Contributions. A short statement must be provided indicating how each author contributed to the work. For example: AB and CD conceived and designed the study. CD and EF conducted data gathering. GH performed statistical analyses. AB, EF and GH wrote the article.

References

[1] G. Antonelli, *Underwater Robots*, vol. 96. Springer Tracts in Advanced Robotics (Springer International Publishing, Switzerland, 2014).

[2] T. I. Fossen, *Handbook of Marine Craft Hydrodynamics and Motion Control* (John Wiley & Sons, Ltd., United Kingdom, 2011).

[3] P. Cardenas and E. A. de Barros, "Estimation of AUV hydrodynamic coefficients using analytical and system identification approaches," *IEEE J. Ocean. Eng.*, 1–20 (2019). 10.1109/JOE.2019.2930421

[4] M. Caccia, G. Indiveri and G. Veruggio, "Modelling and identification of open-frame variable configuration unmanned underwater vehicles," *IEEE J. Ocean. Eng.* **5**, 227–240 (2000).

[5] Z. Peng, J. Wang and Q.-L. Han, "Path-following control of autonomous underwater vehicles subject to velocity and input constraints via neurodynamic optimization," *IEEE Trans. Ind. Electron.* **66**(11), 8724–8732 (2018).