

RESEARCH ARTICLE



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# Robotica: L<sup>A</sup>T<sub>E</sub>X Guidelines for authors

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## Abstract

This guide is for authors who are preparing papers for the *Robotica* journal using the L<sup>A</sup>T<sub>E</sub>X document preparation system and the CUP ROB style file.

## 1. Introduction

The layout design for the *Robotica* journal has been implemented as a L<sup>A</sup>T<sub>E</sub>X style file. The ROB style file is based on the ARTICLE style as discussed in the L<sup>A</sup>T<sub>E</sub>X manual. Commands which differ from the standard L<sup>A</sup>T<sub>E</sub>X interface, or which are provided in addition to the standard interface, are explained in this guide. This guide is not a substitute for the L<sup>A</sup>T<sub>E</sub>X manual itself.

### 1.1. Introduction to L<sup>A</sup>T<sub>E</sub>X

The L<sup>A</sup>T<sub>E</sub>X<sup>1</sup> document preparation system is a special version of the T<sub>E</sub>X typesetting program. L<sup>A</sup>T<sub>E</sub>X adds to T<sub>E</sub>X 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.

L<sup>A</sup>T<sub>E</sub>X 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. L<sup>A</sup>T<sub>E</sub>X 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 L<sup>A</sup>T<sub>E</sub>X interface such that any document which can be produced using the standard L<sup>A</sup>T<sub>E</sub>X ARTICLE style can also be produced with the ROB style. However,

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<sup>1</sup> 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 L<sup>A</sup>T<sub>E</sub>X 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 L<sup>A</sup>T<sub>E</sub>X 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 captured 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.<sup>2</sup>

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<sup>2</sup>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

L<sup>A</sup>T<sub>E</sub>X 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 L<sup>A</sup>T<sub>E</sub>X 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

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 of working with LaTeX code, where the `\includegraphics` command is used to load art files. The `scale` option is used in `\includegraphics` to reduce the size of the image. 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.

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

### 3.5. Creating new theorem-like environments

You can create your own environments in  $\text{\LaTeX}$ , 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  $\text{\LaTeX}$  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

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

and

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

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.

**Financial Support.** If you have nothing to declare, write This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

**Conflicts of Interest.** You must declare any potential conflicts of interest, whether personal, financial or other. If there is nothing, write The authors declare no conflicts of interest exist.

**Ethical Approval.** If your paper includes experimentation with vertebrates, you must give details here of the body that approved the study, together with any relevant identification number. If your study did not include such experiments, write Not applicable.

**Acknowledgements.** You may also include an Acknowledgements section if you wish. Please note that this must be separate from the Financial Support declaration. **Please note: If you have used AI in the research or preparation of the manuscript, this MUST be declared in the Acknowledgements. Authors should state what tool was used, what it was used for, and confirm that all authors reviewed the content and take full responsibility for the paper.**

[The following reference list is for illustration purposes only]

## 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).