IET Journals
The Institution of Engineering and Technology

INSTRUCTION TO AUTHORS

ISSN 1751-8644
doi: 0000000000
www.ietdl.org

1 Instructions for the Control Theory and Applications (CTA) LaTeX Template

This latex class file is available for authors to prepare the manuscript for the Institution of Engineering and Technology (IET) Journals. It is assumed that the authors are familiar with either plain TeX, LaTeX, $\mathcal{AMS}$-TeX or a standard latex set-up, hence only the essential points are described in this document. For more details please see the *LaTeX User's Guide* or *The not so short introduction to LaTeX 2ε*.

2 Installation

Within the supplied set of files, `cta-author.cls` need to be copied into a directory where tex looks for input files. The other files need to be kept as a reference while preparing your manuscript. Please use pre-defined commands from `cta_sample.tex` for title, authors, address, abstract, body etc.

3 How to start using cta-author.cls

Before you type anything that actually appears in the paper you need to include a `\documentclass{cta-author}` command at the very beginning and then, the two commands that have to be part of any latex document, `\begin{document}` at the start and the `\end{document}` at the end of your paper. The main structure of your document should be as follows:

```
\documentclass{cta-author}
\usepackage[...]{packages}
\title{...}
\author{\au{S. Cheng$^{1,2}$} \au{J.C. Ji$^1$} \au{J. Zhou$^2$}}
%%\au{} represent author name

\address{\add{1}{.......}
%%\add{} represent author affiliation numbers
\add{2}{.......}
\email{........}}

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

\maketitle

\begin{document}

\section{....}
...
\subsection{....}
....
\end{document}
```

4 Table & Figure environment

To get the table caption use the command `\processtable{....}`, ensure to insert a brace { before `\begin{tabular}` and closing brace } after `\end{tabular}` (see below the table coding in detail).

```
\begin{table}[!t]
\processtable{Mobile robot parameters\label{tab1}}
{\begin{tabular}{@{\extracolsep{\fill}}lllll}\toprule
& & & Pioneer 2DX \\
Parameters & Pioneer 3DX & Pioneer 2DX & with load (4\,Kg) & Units\\\midrule
$\vartheta_{1}$ & \phantom{$-$}0.24089 & \phantom{$-$}0.3037 & \phantom{$-$}0.1992 & s \\
$\vartheta_{2}$ & \phantom{$-$}0.2424 & \phantom{$-$}0.2768 & \phantom{$-$}0.13736 & s \\
$\vartheta_{3}$ & $-$9.3603e$^{-4}$ & $-$4.018e$^{-4}$ & $-$1.954e$^{-3}$ & s.m/rad$^{2}$ \\
$\vartheta_{4}$ & \phantom{$-$}0.99629 & \phantom{$-$}0.9835 & \phantom{$-$}0.9907 \\
```

```
$\vartheta_{5}$ & $-$3.7256e$^{-3}$ & $-$3.818e$^{-3}$ & $-$1.554e$^{-2}$ & s/m \\
$\vartheta_{6}$ & \phantom{$-$}1.0915 & \phantom{$-$}1.0725 & \phantom{$-$}0.9866\\\botrule
\end{tabular}}{}
\end{table}
```

Suppose, if you want to fit the table in double column, then use `\fwprocesstable{....}` as shown below:

```
\begin{table}[t]
\fwprocesstable{Coefficients and remainders for distribution KK ($k = 0.05$,
$v = 3$, $c_{1} = 1.5$, $c_{2} = 4.5$)}
{\begin{tabular*}{28pc}{@{\extracolsep{\fill}}lcc@{}}\toprule
$n$ & $a_{n}^{2}$ & $r_{k}(1)$\\\midrule
0 & 3.602576748428 & 1.493719547999\\
1 & 1.384791111989 & 0.108928436101\\
2 & 0.108600438794 & 0.000327997399\\
3 & 0.000275794597 & 0.000052202814\\
4 & 0.000018178621 & 0.000006407300\\\botrule
\end{tabular*}}{Table footnote}
\end{table}
```

For figure caption use the following coding:

```
\begin{figure}[!t]
\centering{\includegraphics{fig2.eps}}
\caption{Consensus of trajectories of agents without a leader
\figfooter{a}{$\cos({\rm t})\omega_1=0.5$}
\figfooter{b}{$\omega_1=0$
{\rm Initial conditions and other parameters are chosen as $(p_i(0),q_i(0))=(0.2i,0.3i)$,
$c_{ij}=c_{ji}=0.2(i+j)$ and $m_i=0.1i (i,j=1,2,\ldots,6)$.}}
\label{fig2}}
\end{figure}
```

The command `\figfooter{}{}` should be used to get the figure notes under figure caption.

4.1 Equations

Equations are used in the same way as described in the LaTeX manual. Equations are numbered consecutively, with equation numbers in parentheses flush right.

For example, if you type

```
\begin{equation}\label{eq1}
\int^{r_2}_0 F(r,\varphi){\rm d}r\,{\rm d}\varphi = [\sigma r_2/(2\mu_0)]
\int^{\infty}_0\exp(-\lambda|z_j-z_i|)\lambda^{-1}J_1 (\lambda r_2)J_0
(\lambda r_i\,\lambda {\rm d}\lambda)
\end{equation}
```

then you will get the following output:

$$\int_0^{r_2} F(r,\varphi)\mathrm{d}r\,\mathrm{d}\varphi = [\sigma r_2/(2\mu_0)]\int_0^{\infty}\exp(-\lambda|z_j - z_i|)\lambda^{-1}J_1(\lambda r_2)J_0(\lambda r_i\,\lambda\mathrm{d}\lambda) \tag{1}$$

$\mathcal{AMS}$-LaTeX has several environments that make it easier to typeset complicated multiline displayed equations. These are explained in the $\mathcal{AMS}$-LaTeX User Guide. A `subequation` environment is available to create equations with sub-numbering of the equation counter. It takes one (optional) argument to specify the way that the sub-counter should appear.

4.2 Quotes and displayed text

Quotes are indented from the left and right margins. There are various types of quotes, short quote, long quote and display poetry.

The coding for short quote is `\begin{quote}...\end{quote}`.

> This is a short quotation. It consists of a single paragraph of text. See how it is formatted.

The coding for long quote is `\begin{quotation}...\end{quotation}`.

> This is a longer quotation. It consists of two paragraphs of text, neither of which are particularly interesting.
>
> This is the second paragraph of the quotation. It is just as dull as the first paragraph.

4.3 Listings

Another frequently displayed structure is a list. There are various types of list numbered, itemized and bulleted list.

The coding for bulleted list are as follows:

```
\begin{itemize}
\item Bulleted list 1
\item Bulleted list 2
\item Bulleted list 3
\end{itemize}
```

The coding for numbered list are as follows:

```
\begin{enumerate}
\item Numbered list 1
\item Numbered list 2
\item Numbered list 3
\end{enumerate}
```

The coding for description list are as follows:

```
\begin{description}
\item Description list 1
\item Description list 2
\item Description list 3
\end{description}
```

4.4 Enunciations like theorem, lemma etc.

The $\mathcal{AMS}$-LaTeX package for enunciations (amsthm.sty) has been already loaded in the class file. For example, the command `\newtheorem{theorem}{Theorem}` has been already defined in the class file.

To get the theorem environment use the coding as:

```
\begin{theorem}
Theorem text. Theorem text. Theorem text.
Theorem text. Theorem text. Theorem text.
\end{theorem}
```

Similarly, we can define for lemma, corollary, proposition, definition etc.

4.5 Cross-referencing

LATEX provides the following commands for cross referencing

`\label{marker}`, `\ref{marker}` and `\pageref{marker}`

where marker is an identifier chosen by the user. LATEX replaces `\ref` by the number of the section, subsection, figure, table, or theorem after which the corresponding `\label` command was issued. `\pageref` prints the page number of the page where the `\label` command occurred.

4.6 Citations

Citations are made with the `\cite` command as usual. In this class file we have used natbib.sty for cross references and reference style.

For bibliography the natbib package has been defined in the template as `\usepackage{natbib}`.

For more details about natbib.sty can be found at http://ctan.org/tex-archive/macros/latex/contrib/natbib/

Acknowledgements

Acknowledgements and other unnumbered sections are created using the `\section*` command:

```
\section*{Acknowledgment}
```

Back Matter

4.7 References

The reference entries can be LaTeX typed bibliographies or generated through a BIBTeX database. BIBTeX is an adjunct to LaTeX that aids in the preparation of bibliographies. BIBTeX allows authors to build up a database or collection of bibliography entries that may be used for many manuscripts. They also save us the trouble of having to specify formatting. More details can be found in the *BIBTeX Guide*. For clear understanding, please go through the documentation of `IET_bst_HOWTO.pdf`.

For LaTeX reference entries use the `\begin{thebibliography}..\end{thebibliography}` environment (see below) to make references in your paper. By default the class file will produce the unnumbered LaTeX bibliography.

```
\begin{thebibliography}{99}

\bibitem{1}
Vicsek T., Czir\'{o}k A., Ben-Jacob E., Cohen I.: 'Novel type of phase
transition in a system of self-driven particles', \textit{Phys.
Rev. Lett.}, 1995, \textbf{75}, pp.~1226--1229

\bibitem{2}
Jadbabaie A., Lin J., Morse A.S.: 'Coordination of groups of
mobile autonomous agents using nearest neighbor rules', \textit{IEEE
Trans. Autom. Control}, 2003, \textbf{48}, pp.~988--1001

\bibitem{3}
Olfati-Saber R., Murray R.M.: 'Consensus problems in networks
of agents with switching topology and time-delays', \textit{IEEE Trans.
Autom. Control}, 2004, \textbf{49}, pp.~1520--1533

\bibitem{4}
Ren W., Atkins E.: 'Distributed multi-vehicle coordinated
control via local information exchange', \textit{Int. J. Robust
Nonlinear Control}, 2007, \textbf{17}, pp.~1002--1033

\bibitem{5}
Ren W.: 'On consensus algorithms for double-integrator dynamics',
\textit{IEEE Trans. Autom. Control}, 2008, \textbf{53}, pp.~1503--1509

\end{thebibliography}
```