Abstract

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Paper

Usage of the Style File for Transactions of the Institute of Systems, Control and Information Engineers*

Taro SUZUKI†, Hanako SATO‡, Jiro TANAKA§ and John SMITH¶

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1. Introduction

This document describes how to use the LaTeX2e class file, named "`scitrans.cls`", for Transactions of the Institute of Systems, Control and Information Engineers (ISCIE).

`scitrans.cls` works together with the following nine files:

- `scitrans.cls`
- `sci209.sty, scij.sty, scie.sty, scims.sty`
- `JT1scimc.fd, JT1scigt.fd`
- `JY1scimc.fd, JY1scigt.fd`

Please make sure that all these files are placed in the same directory as the source file and should not be modified.

2. Sections, etc.

This is an example of `\section{ }`.

2.1 Subsections

This is an example of `\subsection{ }`.

2.1.1 Sub-Subsections

This is an example of `\subsubsection{ }`.

(1) Paragraphs

This is an example of `\paragraph{ }`. Please insert a blank line before `\paragraph{ }`.

(a) Subparagraphs

This is an example of `\subparagraph{ }`. Please insert a blank line before `\subparagraph{ }`.

3. Theorems, etc.

In the `scitrans.cls` class file, theorems and related structures such as definition, lemma, proposition, corollary, example, assumption, remark and proof are handled. For example,

[**Theorem 1**] This is an example of the theorem environment. The usage of the lemma, definition, proposition, corollary, example and assumption environments are the same as that of the theorem environment.

(Proof) This is an example of the proof environment. At the end of each proof, asterisks "**" are automatically placed as the Q.E.D. symbol, whereas they will be replaced by the symbol "□" in the final manuscript. □

(Remark 1) This is an example of the remark environment.

If the author wishes to declare a new theorem-like environment, `newtheoremenv` and `newparenenv` can be used. For example,

[**Question**] This is an example of declaring a new environment by `newtheoremenv`.

(Answer) This is an example of declaring a new environment by `newparenenv`.

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Key Words: style file, transactions, ISCIE, paper.

4. Equations

Equations are created by the traditional `equation` environment. In order to produce multiline equations, the `eqnarray` environment can be used. For example,

$$\dot{\boldsymbol{x}}(t) = A\boldsymbol{x}(t) + B\boldsymbol{u}(t) + \sum_{k=1}^{N} \Gamma_k \boldsymbol{d}k(t) \tag{1}$$

$$\boldsymbol{y}(t) = C\boldsymbol{x}(t) + D\boldsymbol{u}(t) \tag{2}$$

$$\boldsymbol{u}(t) = F\boldsymbol{x}(t) \tag{3}$$

$$\begin{aligned} &\frac{1}{2\pi}\int_{-\infty}^{\infty} \mathrm{Tr}\{\boldsymbol{G}^{\mathrm{T}}(-j\omega)\boldsymbol{G}(j\omega)\}d\omega \\ &\quad = \frac{1}{2\pi}\int_{-\infty}^{\infty} \mathrm{Tr}\{B^{\mathrm{T}}(-j\omega I - A^{\mathrm{T}})^{-1}C^{\mathrm{T}} \\ &\quad \times C(j\omega I - A)^{-1}B\}d\omega \qquad (4a) \\ &\quad = \frac{1}{2\pi j}\int_{-j\infty}^{j\infty} \mathrm{Tr}\left\{\left[\begin{array}{c|c} A & B \\ \hline C & 0 \end{array}\right]^{\sim}\left[\begin{array}{c|c} A & B \\ \hline C & 0 \end{array}\right]\right\} ds \qquad (4b) \end{aligned}$$

In multiline equations, please pay attention to the message "`Overfull \hbox`", and the equations should be composed with the proper length.

With the `subequations` environment, sub-equation numbers such as (4a), (4b) can be achieved. In equations, bold fonts can be output by using `\mbf` command. The superscript T which expresses the transpose of a matrix and H^{∞} can be achieved by `\T` and `\hinf` respectively.

For in-line equations, please use $\sum_{k=1}^{N}$ instead of $\sum_{k=1}^{N}$. Similarly, the rule is applicable to `\lim`, `\max`, `\min`, etc. For super and subscripts, please use X_a^b (`$X_a^b$`) instead of ${X_a}^b$ (`${X_a}^b$`).

5. Figures and Tables

Graphics files (EPS files) can be inserted into a manuscript by `\includegraphics` command of the `graphicx` package (see Fig. 1). Here are some examples to insert graphics into a manuscript. The `picture` environment is also available to draw figures (see Figs. 2, 3).

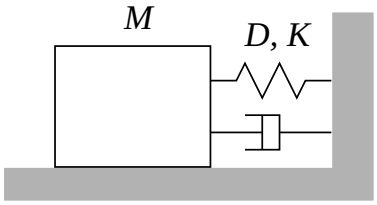


Fig. 1 Mass-spring-damper system

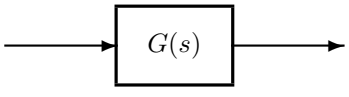


Fig. 2 Plant

Table 1 Example of table (`slashbox.sty`)

Room \ Date	5/31	6/1	6/2
Room A	—	—	—
Room C12	—	—	—
Room F1201	—	—	—

Here is an example of a table. In the `scitrans.cls`, the `\tabular` command has been extended for the ISCIE format. The `\tabular` command provides the thin and thick lines. The thin line can be achieved by the traditional way: "`|`" for the vertical line and "`\hline`" for the horizontal line. The thick line can be achieved by "`!`" and "`\hlinethick`" for the vertical and horizontal thick lines respectively.

The `arydshln.sty` is included in the `scitrans.cls` so that dashed lines are also available. Examples are shown in Tables 2, 3.

Table 2 Commands for reference

Definition	`\rdefinition`
Theorem	`\rtheorem`
Lemma	`\rlemma`
Proposition	`\rproposition`
Corollary	`\rcorollary`
Example	`\rexample`

Table 3 Commands for reference to equations, figures and tables

Equation	`\req`
Equation in appendices	`\Req`
Equation with sub-number	`\Req`
Figure	`\rfig`
Table	`\rtab`

6. Citations

Citations can be made with the `\cite` command[1]. The `\cite*` command automatically places a word "Ref." before the reference number as "Ref. [1]".

The multiple citation such as `\cite{foo1,foo2}` and `\cite{foo2,foo3,foo4}` achieves [1,2] and [2–4] respectively.

7. Cross-Referencing

In order to reference the definition, theorem etc., please use the commands listed in Table 2, for example: `\rtheorem{theorem:1}`, `\rremark{remarl:1}`.

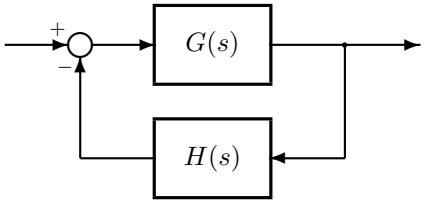


Fig. 3 Feedback control system

Theorem 1 is an example of the `\rtheorem` command.

Remark 1 is an example of the `\rremark` command.

For referencing the equation, figure and table, please use the commands listed in Table 3. These commands automatically add appropriate words before reference numbers. For example, achieve

- `\req{eq:1}` ⟹ eq. (1)
- `\rfig{fig:1}` ⟹ Fig. 1
- `\rtab{table:1}` ⟹ Table 1

The multiple referencing can be also achieved, for example,

- `\req{eq:1,eq:2,eq:3}` ⟹ eqs. (1)–(3)
- `\rfig{fig:1,fig:2}` ⟹ Figs. 1, 2
- `\rtab{table:1,table:2}` ⟹ Tables 1, 2

In order to use the same format through the manuscript, please do not use traditional `\ref` command.

8. Others

8.1 Footnote

The footnote is available with `\footnote` command[1].

8.2 URL

The `scitrans.cls` provides the `\url` command to output a URL. For example, http://www.iscie.or.jp/ can be achieved by `\url{http://www.iscie.or.jp/}`. Also, `http://www.iscie.or.jp/` can be achieved by `{\tt \url{http://www.iscie.or.jp/}}`.

Acknowledgements

The `\acknowledgement` command can be used to state the acknowledgements.

References

[1] I. S. Cie: The ISCIE style option; *ISCIE Journal*, Vol. 0, No. 0, pp. 000–999 (1999)

[2] R. E. Kalman: A New Approach to Linear Filtering and Prediction Problems; *Trans. of the ASME–J. of Basic Engineering*, Vol. 82 (Series D), pp. 35–45 (1960)

[3] A. Papoulis: *Probability, Random Variables and Stochastic Processes*; 4th Edition, McGraw-Hill (2002)

[4] Authors: Article title, *Book Title* (Editor(s), Ed(s).), Publisher, pp. 00–99 (1999)

Appendix

This is an example of the `\appendix` command. If there is only one section, please use `\section*` command. If there is more than one section, please use `\section` command.

Appendix 1. Equation in Appendix

This is an example of `\section` command in the appendix.

$$u = Fx \tag{A1}$$

Appendix 2. Slash Line in Table

In `scitrans.cls`, `slashbox.sty` is included so that slash lines are available in tables. The followings are quoted from the manual of `slashbox.sty` which is slightly modified for this document.

The usage is pretty straightforward, such as

Room \ Date	5/31	6/1	6/2
Room A			
Room C12			
Room F102			

You may include a newline (\\) in 'Room' and/or 'Date'. Note that you will get spaces aside the slash line if there is a wider column in the same column of a different line. In such a case, you need to specify the width of the slashed column by saying

Room \ Date	5/31	6/1
Long Long Room Name		
Room C12		
Room F102		

The specified width is ignored if it is narrower than the natural width of the column.

`\(back)slashbox` assumes by default that there is a blank space of width `\tabcolsep` on both sides of the column. Thus the slash line might exceed the boundary when you use `@{}` etc.

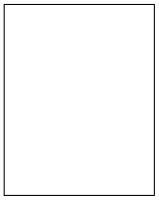
You can avoid it by specifying

Room \ Date	5/31	6/1	6/2
• Room A			
• Room C12			
• Room F102			

Here `[l]` tells the command that there is no extra space on the left of this column. You can use `[r]` and `[lr]` likewise. You have to also specify the width of the column in this case, but it can be 0pt.

Authors

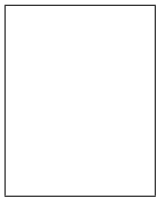
Given-name Family-name (Member)



Example of `\authorbiography` command. If you wish to include your photograph, please use this command. Please submit your photo after acceptance for publication. Please write down your biography here.... Please write down your biography here.... Please write down your biography here.... Please write down your biography here.... Please write down your biography here.... Please write down your biography here....

[1] This is an example of the `\footnote` command.

Given-name Family-name (Non-Member)



Example of `\authorbiography` command. If you wish to include your photograph, please use this command. Please submit your photo after acceptance for publication. Please write down your biography here.... Please write down your biography here.... Please write down your biography here.... Please write down your biography here.... Please write down your biography here.... Please write down your biography here....

Given-name Family-name (Member)

Example of `\authorbiography*` command. If you do not wish to include your photograph, please use this command. Please write down your biography here.... Please write down your biography here.... Please write down your biography here.... Please write down your biography here....