

How to Typeset Your Papers in L^AT_EX (Version 7.1)

HIROSHI NAKASHIMA^{†1,*1} and YASUKI SAITO^{†2}

This pamphlet is a guide to producing a draft to be submitted to IPSJ Journal and Transactions and the final camera-ready manuscript of a paper to appear in the Journal/Transactions, using L^AT_EX and special style files. Since the pamphlet itself is produced with the style files, it will help you to refer its source file which is distributed with the style files.

1. Introduction

The Information Processing Society of Japan now employs L^AT_EX to make up the Journal/Transactions for quick and low-cost publishing. This means that your L^AT_EX source file is basically used as the source of the final printing process. Therefore, your cooperation is essential for the publishing of the Journal/Transactions inheriting its traditional and easy-to-read style.

This make-up system, on the other hand, should be also convenient for you, because it will greatly reduce troubles on proofreading by eliminating printer's errors inevitable in conventional type-printing systems. You can easily produce the final version of your paper conforming to the traditional style using special style files and standard L^AT_EX commands. A style file for submission is also available and you can easily switch the style from submission to final with relatively few changes. Moreover, the draft produced by this submission style are much more readable for both you and referees than those following conventional submission rules.

Although almost everything for final make-up can be done by using standard L^AT_EX commands, there are a few additional and essential commands. Also there

are special rules that are not checked by the style files. Therefore, you are requested *to read this guide carefully and to follow it rigidly* in order to make all the people involved in the publishing happy!

2. L^AT_EX Environment

Although a style file, `ipsjcommon.sty`, has some symbols in Japanese character set in its last part, you can use the standard (i.e., non-Japanese) L^AT_EX for your English papers because the style automatically recognizes your environment and lets your L^AT_EX stop to read the part it cannot cope with. One exception is, however, that you have to use one of non-Japanese versions of Bib_TE_X styles `ipsjsort-e.bst` or `ipsjunsrt-e.bst`.

The style files are confirmed to work with the following L^AT_EX 2_ε versions.

T_EX 3.141592 + L^AT_EX 2_ε 2003/12/01

You may use the styles in either native-mode or L^AT_EX 2.09 compatible mode. Although we expect they will work with older versions, it is strongly recommended to use the version shown above or later one.

If you still love L^AT_EX 2.09, do not be afraid to use it because the styles are backward compatible.

3. How to Use Style Files

3.1 General Advice

The Journal/Transactions, as opposed to conference proceedings, have a traditional and *stiff* style. This makes the style files also *stiff* and strongly restricts the customizability that is one of the useful features of L^AT_EX. For example, you must not change *style parameters*, such as `\texheight`. It is not easy to show which customizations are allowed, but the standard “Don’t tamper with it unless you are confident” should work well.

Note that if you do something you should not, *you may not have error messages but simply have ugly results*.

3.2 Option Styles

The following six standard option styles may be specified as optional arguments of `\documentclass` or `\documentstyle`.

`english` for English papers.

^{†1} Kyoto University

^{*1} Presently with Institute for Advanced Study, Princeton (just joke)

^{†2} NTT Basic Research Laboratories

^{*1} The real author is the Editorial Board of the Trans. IPSJ.

landscape for online publishing*¹
portrait for paper publishing.
draft for draft versions.
technote for technical notes.
preface for preface of an issue.
sigrecommended for a paper recommended by a SIG.
invited for invited papers.

Any (meaningful) combinations of options are acceptable. The style has other options to make a non-Journal/Transactions manuscript. The option **techrep** is for SIG reports (see A.1 of Appendix), while **private** may be used for your private version (to link it from your own web page). With **private** option, additionally, you may put a copyright notice to the left top corner of the first page by;

`\copyrightnotice{\copyright-notice}`

as per the IPSJ Copyright Regulation.

If you specify auxiliary style files by `\usepackage`*², you must include them into the file package when you send your final version to IPSJ. However, style files included in L^AT_EX 2_ε standard distribution (e.g. **graphicx**) may be omitted. Note that style files may be incompatible to the style of the Journal/Transactions.

3.3 Title, Author Names, etc.

Describe the title of your paper, author names and affiliations, and abstract using the commands and environment. Then perform `\maketitle` that automatically puts them at the appropriate position. In the draft version, the title and abstract are automatically printed onto separate pages, while author names and affiliations are not printed to make your paper anonymous.

Title The title specified by `\title` is made centered. Even if the title is too long to be fit to one line, *automatic line break is not performed*. If your title is long, insert `\\` into appropriate positions to break lines. A multiple line title is first flushed left and then is centered with respect to the widest line.

The title also appears in the header of odd pages. If your title is too long, provide

a shortened title for the header to `\title` as its optional argument as follows.

`\title[{for-header}]{{title}}`

Author Name and Affiliation Define the affiliation of each author with a label by using `\affilabel`, in order from the first author, to have footnotes showing the affiliations with `†1`, `†2` and so on. If two or more authors belong to the same organization, their affiliation should be declared once. If an author moved somewhere after the paper was written and he/she want to show his/her new affiliation, use `\paffilabel` to define and to put it with `*1`, `*2`, and so on. The `\author` argument is a list of author names separated by `\and`. Each author name is followed by one or more `\affiref{<label>}` to attach marks corresponding to labels that have been defined by `\affilabel` or `\paffilabel`.

Abstract The abstract of your paper should be given as the contents for the **abstract** environment.

3.4 Sectioning

L^AT_EX standard commands such as `\section` and `\subsection` are available for sectioning. The section heading of `\section` occupies two lines, while others are put in one line.

For definitions, axioms, theorems, and so on, define and use appropriate environments with `\newtheorem`. Note that the contents of such environments are not italicized. If you want have an italicized environment, use `\newtheorem*`.

3.5 Main Text

Fixed Baselines Each page of the Journal/Transactions is formatted with double-column style. The printing tradition of double-column requires that a line in the left column and its neighbor in the right column has the same baseline. To meet this requirement, the style files carefully control the progression of baselines when a vertical space is inserted for section titles and so on. Therefore, *you must not use* `\vspace` *nor* `\vskip`.

If you want to check whether baselines progress properly, add the `\checklines` command in the preamble to print baselines on which (ordinary) lines should be located. This command, however, should be omitted when you send your source to the IPSJ.

Font Size You will see that various size fonts are used in the printed result of your paper. Since these fonts are automatically and carefully chosen by

*1 This option to typeset in landscape format for online publishing is default.

*2 Or in the optional argument of `documentstyle` if you use L^AT_EX 2.09

the style files, you are free from headach of selecting proper fonts. In fact, it is strongly recommended not to use font-size-changing commands such as `\large` and `\small` in the main text, because they are quite harmful to the retention of keeping fixed baselines. If you really want to use smaller fonts, `\small` or `\footnotesize`, in order to pack many things in a line, use their *starred* versions, `\small*` or `\footnote*`. They will change the font size while retaining spaces between baselines the same as `\normalsize`.

Overfull and Underfull The final result must be free from any overfulls.

It is well known that almost all overfulls can be avoided by a little effort when describing sentences. For example, avoiding long in-text formulas and `\verb` is very effective. However, tricks using `flushleft` environment, `\` or `\linebreak` are not recommended, because they cause quite ugly results.

As for underfulls, you will easily get the following warning message

```
Underfull \hbox (badness 10000) detected
```

by `\` at the end of a paragraph. This message is also output when you use `\` just before a list-like environment, just before an `\item`, and at the end of the environment. Such underfulls cause ugly empty lines and flood of warnings that will hide an important error message.

3.6 Formulas

- In-text Formulas

In-text formulas may be surrounded by any proper math-open/close pair, i.e. `$` and `$`, `\(` and `\)`, or `\begin` and `\end` for `math` environment. Note that tall materials in in-text formulas, such as $\frac{a}{b}$ (`\frac{a}{b}`), are ugly and will disarrange the baseline progression.

- Displayed Formulas

Displayed formulas *must not be surrounded by the pair of `$$`*. Instead, use the `\[` and `\]` pair or one of the environments `displaymath`, `equation` and `eqnarray`. These commands/environments indent formulas (not centered) and keep fixed baselines as follows.

$$\Delta_l = \sum_{i=l+1}^L \delta_{pi}. \quad (1)$$

- `eqnarray` environment

```
\begin{figure}[tb]
  <figure-body>
\caption{<caption>}
\label{...}
\end{figure}
```

Fig. 1 Single column figure with caption explicitly broken by `\`.

For a sequence of two or more related formulas (equations), use the `eqnarray` environment to line up them at equal (or unequal) signs, instead of `\[`/`\]` or `equation` environment. Note that contents of `eqnarray` will not be broken over two pages. If an `eqnarray` has many lines and you want a page break in it, add the option `[s]` as `\begin{eqnarray}[s]`.

- Special Fonts

It is strongly recommended to use only standard \LaTeX math fonts. Otherwise, you must report that you are using some special fonts and will be deeply involved in the dark side of printing process.

3.7 Figures

A figure fit to one column is specified by the form shown in **Fig. 1**. Note that you must not specify `h` option.

The `\caption` of a figure should be given below of the figure body together

```
\begin{minipage}[t]{%
  {0.5\columnwidth}}
\CaptionType{table}
\caption{...}
\ecaption{...}
\label{...}
\makebox[\textwidth][c]{%
\begin{tabular}[t]{lcr}
\hline\hline
left&center&right\\ \hline
L1&C1&R1\\
L2&C2&R2\\ \hline
\end{tabular}}
\end{minipage}
```

Fig. 2 Contents of Table 1.

Table 1 A table built by Fig. 2.

left	center	right
L1	C1	R1
L2	C2	R2

```

\begin{figure}*[t]
  \langle figure-body \rangle
\caption{\langle caption \rangle}
\label{...}
\end{figure*}

```

Fig. 3 Double column figure

with a `\label` command. A long caption will be automatically broken into two or more lines and centered with respect to the widest line. You can assist, however, with the line breaking by adding `\\` to obtain more beautiful result especially in the case of two-line captions as shown in Fig. 1.

If you want to rank two or more figures and/or tables in a `figure` (or `table`) environment in order to save space, it is done by enclosing each figure/table and its `\caption` in a `minipage` environment as shown in **Fig. 2** and **Table 1**. Also as exemplified by them which are in a `figure` environment, the caption of Table 1 is correctly typeset because the `minipage` for it has `\CaptionType{table}` command to specify the type of caption. The command of course can be used with `figure` argument to give a figure caption.

Figure 3 shows how to make a double column figure.

You may use any size of fonts as shown in Fig. 3. Also you may include an encapsulated PostScript file (so called EPS file) as the body of a figure. For the inclusion, do;

```
\usepackage{graphicx}
```

in the preamble and put `\includegraphics` command at which you wish to embed the EPS graphics with its file name (and options if necessary). If you use \LaTeX 2.09, you have to include `epsf` in the optional argument of `\documentstyle` and use `\epsfile` for the embedment. Note that only the standard fonts shown in Appendix are usable in PostScript files.

You might have noticed that the first reference to Fig.1 is bold-faced while the second and third are typed in roman fonts. This font switching is a rule of the Journal/Transactions, and will be automatically performed if you use `\figref{\label}` instead of `Fig.\ref{\label}`. Another rule is that “Figure”

must be used instead of “Fig.” if the reference is the first word of a sentence, as the first reference to Fig.3. Unfortunately, this switching is too hard to do automatically, and you must use `\Figref{\label}` in such cases.

3.8 Tables

A table with many rules is not very beautiful. **Table 2** shows an example of a table with standard style rules. Note that the uppermost rule is doubled, and no rules are drawn on the left and right edges. The caption should be put above the table. The default font size in tables is `\footnotesize`. Any reference to a table should be made using `\tabref{\label}`^{*1}.

3.9 Itemizing

There are four *families* of three \LaTeX standard itemizing environments, `enumerate`, `itemize` and `description`, as follows.

- `enumerate`, `itemize`, `description`

Similar to \LaTeX -standard environment except for wider indentation. The indentation of `enumerate` is three times as wide as `\parindent`, while those of

Table 2 Sections and sub-sections in which list-like environments are used (example of table)

	enumerate	itemize	description
type-1	2	3.3	
type-2	—	3.9	3.5
type-3		—	3.3
type-4	—	3.6	3.2
type-1:	<code>enumerate</code> , etc.		
type-2:	<code>enumerate*</code> , etc.		
type-3:	<code>Enumerate</code> , etc.		
type-4:	<code>ENUMERATE</code> , etc.		

*1 `\Tabref` is also available but is just the same as `\tabref`.

others are twice. The `enumerate` labels are not \LaTeX standard;

1. (a) i. A.

but have parentheses with small spaces as follows.

- (1) (a) (i) (A)

- `enumerate*`, `itemize*`, `description*`

Similar to `enumerate` etc., but indentation is as wide as `\parindent`.

- `Enumerate`, `Itemize`, `Description`

No indentation is performed.

- `ENUMERATE`, `ITEMIZE`, `DESCRIPTION`

Indent only the first line by `\parindent`.

See Table 2 to see examples of each environment in this guide.

3.10 Keeping Fixed Baselines

As described before, every (ordinary) lines in the main text should be placed on fixed baselines. Therefore, if your text has extraordinary tall material and it shifts other lines from their fixed baselines, enclose the material in an `adjustvboxheight` environment. For example,

$$\sum_{i=0}^n i$$

is produced by the following sequence.

```
\begin{adjustvboxheight}
\begin{quote}
\fbbox{$\displaystyle\sum_{i=0}^n i$}
\end{quote}
\end{adjustvboxheight}
```

You will find the line just after the odd thing is on a fixed baseline.

3.11 Footnotes

The command `\footnote` produces footnotes with marks like ^{*1} and ^{*2}, re-setting number of footnote marks to one after the page-break. This automatic adjustment of footnote marks, however, usually requires \LaTeX to be run twice.

^{*1} An example of footnote.

(See p. 156 of \LaTeX Book².)

Sometimes, it is preferable to separate a footnote and its mark into different columns. You can cope with such a special case using `\footnotemark` and `\footnotetext` commands.

3.12 Citations

There are two styles of citation. When the citation appears as a word, use the `\Cite` command to produce the citation number with normal fonts. Otherwise, use `\cite` to have subscripted citations. For example,

Goosens explained details of `\LaTeX\cite{latex}` in `\Cite{companion}`.

will produce

Goosens explained details of \LaTeX ² in 1).

as the result.

When three or more texts are cited by `\Cite` or `\cite` and their reference numbers are in series, the first and last numbers are connected by ‘–’ (en-dash) automatically, as 5)–7) and “literatures^{2),8)–10)}.” If texts cited at once are too numerous to specify them by `\Cite` or `\cite`, use the following *multi* versions.

```
\multiCite{\1st-label}\{last-label\}
\multicite{\1st-label}\{last-label\}
```

They produce results such as 3)–10) and “literatures^{11)–17)}.”

3.13 References

References should be arranged in alphabetical or cited order. It is strongly recommended to use \LaTeX and style files `ipsjsort-e.bst` (alphabetical order) or `ipsjunsort-e.bst` (cited order) to make references fit to the traditional style. You will pick up hints by examining the sample bibliography file `ebibsample.bib` and the refereces of this guide produced by \LaTeX with `ipsjunsort-e` style. Remember that you must include `.bbl` file in the file package, instead of `.bib`.

If you cannot use \LaTeX and have to make references manually using `the-bibliography` environment, observe the references of this guide carefully and

^{*2} Another footnote. This footnote appears right column while its mark is in left column. See the source file to know how to do it.

follow its style*³.

3.14 Acknowledgments and Appendices

If you want to acknowledge some people, put your acknowledgments just before the references and enclose them in the `acknowledgment` environment. Acknowledgments will not be printed in drafts.

Appendices, if any, should be just after the references and `\appendix` command. Sectioning commands produce headings like **A.1**, **A.2** and so on in appendices. If you want to make the appendix itself have a title, give a title to `\appendix` as its optional argument, like `\appendix[title]`.

4. Concluding Remarks

We don't dream that the style files are perfect, ...

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Appendix

A.1 How to Make SIG Technical Reports

As SIG technical reports are now published only through IPSJ WEB sites, it has become the job for each author to produce the PDF manuscript for publication compliant to the IPSJ standard format. Typesetting a IPSJ compliant manuscript, however, is easily done by giving `techrep` option to `\documentclass` command. Only one caution for the compliance is that you have to set the counter `year` according to the date of the publication by `\setcounter` command*¹.

*3 The references of this guide are produced by `thebibliography` environment to make the source single file, but the contents are produced by `BiBTeX`.

*1 If the counter is not set in the preamble, you will have a warning message while the counter will have the value according to the date of the \LaTeX execution.