

How to Typeset Your Papers in L^AT_EX (Version 4)

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This pamphlet is a guide to produce 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 Japanese 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 save the troubles on proofreading by eliminating printer's errors that was inevitable in conventional type-printing systems. You will easily produce the final version of your paper conformed to the traditional style using special style files and standard L^AT_EX commands. A style file for submission is also available and you will easily switch the style from submission to final with a quite few change. Moreover, the draft produced by this submission style are much more readable for both you and referees than that 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 the publishing happy.

2. Flow from Submission to Publishing

The process from submission of a paper to the publishing the Journal/Transactions including it is as follows.

(1) Obtaining Style Files

Access the WEB site of IPSJ <http://www.ipsj.or.jp/> to download author's kit including style files. The kit contains the following files.

- (a) `ipsjpapers.sty`
style for final version to make up
- (b) `ipsjpapers.cls`
L^AT_EX 2_ε style for final version
- (c) `ipsjdrafts.sty`
style for drafts to submit
- (d) `ipsjcommon.sty`
auxiliary style for final and draft versions
- (e) `ipsjsort.bst`
BibT_EX style (sorted)
- (f) `ipsjunsrt.bst`
BibT_EX style (unsorted)
- (g) `esample.tex`
source of this guide (for final)
- (h) `desample.tex`
source of this guide (for draft)
- (i) `sample.tex`
Japanese version source of this guide (for final)
- (j) `dsample.tex`
Japanese version source of this guide (for draft)
- (k) `ebibsample.bib`
sample of bibliographic data (English)
- (l) `bibsample.bib`
sample of bibliographic data (Japanese)

The kit can be unpacked and read by most of platforms, including UNIX workstations, Windows (DOS) and Macintosh machines.

(2) Submitting Draft

Make the L^AT_EX source of your draft follow-

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ing this guide, process it by $\text{\LaTeX}$ and print it. Then send *copies of printed result following the “Information for Authors Who Submit Papers to Transactions”* to the IPSJ. The style for submission automatically produce separate pages for author names, titles, and so on, following the rule of submission.

(3) Making Final Version

After you receive the notification of the acceptance, revise your paper following the comments from referees, and add required staffs omitted from the draft, such as biography, if any. The layout of figures and tables should be fixed. After that, *check your paper again and again to remove description errors completely.*

(4) Sending Final Version

Send *both $\text{\LaTeX}$ file package and the hard-copy* to the IPSJ. The standard contents of the file package are `.tex` and `.bbl`. If you include PostScript files and/or special style files, add them into the package. Note that *you must not split your source into multiple .tex files*, because it is hard for printers to access multiple files when they modify your source. Also make it sure carefully that the package contains all necessary files, especially special style files.

The detail of the file transfer, including its destination and packaging method, will be instructed you by the IPSJ secretariat.

(5) Proofreading

The IPSJ may change terms in your paper following its standard, and printing house may modify your source to make it fit to standard printing style. Even if they make no changes, the result printed at the printing house may be different from what you printed because of the difference of $\text{\LaTeX}$ execution environment. Therefore, the galley proof of your paper will be sent to you to check if those modification and/or difference are acceptable. If not, correct errors with red ink. Note that *this proofreading is not for the correction of your error* and you must have fixed them before sending the final version.

(6) Printing and Publishing

Your paper is printed, after the correction of the errors you pointed out if any, and is published as a part of the Journal/Transactions.

3. $\text{\LaTeX}$ Environment

Since the style files uses some symbols in Japanese character set, use Japanese $\text{\LaTeX}$

even for English papers. There are two different versions of Japanese $\text{\LaTeX}$, that based on jTeX (or NTT version) developed by Saito of NTT, and on Japanese $\text{\TeX}$ (or ASCII version) provided from ASCII corporation. Since the style files, however, cope with both versions, you may use what is available to you.

The style files are confirmed to be worked with the following $\text{\LaTeX} 2_{\epsilon}$ versions.

- NTT = $\text{jTeX} 1.6 + \text{\LaTeX} 2_{\epsilon} 1994/12/01$ patch level 3
- ASCII = $\text{pTeX} 3.1415 \text{ p2.1.4} + \text{p}\text{\LaTeX} 2_{\epsilon} 1995/09/01$

You may use the styles in either native-mode or $\text{\LaTeX} 2.09$ compatible mode. If you still love $\text{\LaTeX} 2.09$, the following or later versions should work well with the styles.

- NTT = $\text{jTeX} 1.52 + \text{\LaTeX} 2.09$
- ASCII = $\text{\TeX} 2.99\text{-j1.7} + \text{\LaTeX} 2.09$

Although we expect they will work with older versions, it is strongly recommended to use the versions shown above.

4. How to Use Style Files

4.1 General Advice

The Journal/Transactions, not as conference proceedings, has 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 $\text{\LaTeX}$. 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 do unless you have confidence” should be work well.

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

4.2 Configuration of Paper

The source file must have the following format. Underlined parts can be omitted from draft versions. Note that a few additional commands shown in A.2 of the Appendix are available for a paper included in the Transactions.

```
\documentclass[english]{ipsjpapers} or
\documentclass[english,draft]{ipsjpapers}
Specify other option styles if necessary.
Specify auxiliary styles by \usepackage.
\setcounter{volume}{\langle volume \rangle}
\setcounter{number}{\langle number \rangle}
```

Replace it with `\documentstyle` and, if necessary, add auxiliary style name(s) as its optional argument, when you use $\text{\LaTeX} 2_{\epsilon}$ in 2.09-compatible mode or $\text{\LaTeX} 2.09$.

```

\setcounter{volpageoffset}{\first-page}
\received{\year}{\month}{\day}
\accepted{\year}{\month}{\day}
Define your own macros if necessary.
\begin{document}
\title{\title}
\affilabel{\affiliation-label}{\affiliation}
.....
Declare current affiliation by \paffilabel if necessary.
\author{\1st-author}\and\2nd-author\and...}
\contact{\contact-address}
\begin{abstract}
  \abstract
\end{abstract}
\maketitle
\section{\heading-of-1st-section}
.....
  \main text
.....
Put acknowledgments here by acknowledgment environment if any.
\bibliographystyle{ipsjunsrt} or
\bibliographystyle{ipsjsort}
\bibliography{\bib-data-file}
Put appendices here following \appendix if any.
\begin{biography}
  \biography-of-1st-author
  .....
\end{biography}
\end{document}

```

4.3 Option Styles

There are following five standard option styles which may be specified as optional arguments of `\documentstyle` or `\documentclass`.

english for English papers.
draft for draft versions.
technote for technical notes.
preface for preface of an issue.
printer to use printer's fonts.

Any (meaningful) combinations of options are acceptable. Note that **printer** option may be ignored or cause trouble depending on your environment.

If you specify auxiliary style files by `\usepackage`, 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.

4.4 Volume, Number, etc.

If IPSJ notify you of the volume and number of the issue that your paper is included, the first page number of your paper, reception and acceptance dates, specify them with appropriate commands. If some (or all) of them are not notified, you may omit corresponding commands. The `\year` should be four digit number like 1995, and `\month` should be one or two digit number like 5 (not May).

4.5 Title, Author Names, etc.

Describe the title of your paper, author names and affiliations, and abstract using the commands and environment shown in 4.2. Then do `\maketitle` that automatically put them at the appropriate position.

In the draft version, your contact address must be specified using `\contact`. The draft style automatically prints the title, author names and contact address, and abstract onto separate pages.

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, give shortened title for 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 `\affilabel`, in order from the first author, to have footnotes showing the affiliations with †, †† 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 , , and so on. The argument of `\author` is the 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`. After the sequence of `\affiref`, add one of the following command to show the membership of the author.

```
\member{\member-number}
```

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

`\contact` can be in the final version but is ignored.

for regular members
`\stmember{<member-number>}`
 for student members
`\nomember{<member-number>}`
 for non members

The membership is printed in drafts, but is ignored in final versions.

Contact Address In your draft, contact person name, his/her postal address, phone and facsimile numbers, and e-mail address must be specified as the argument of `contact`. These items may be separated by `\\` for line break. The contact address is ignored in final versions.

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

4.6 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, axiom, theorems, and so on, define appropriate environments by `\newtheorem` and use them. Note that the contents of such an environment is not italicized. If you want have an italicized environment, use `\newtheorem*`.

4.7 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 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 `\checklines` command in 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 the style files, you are free from headachy work to select proper fonts. In fact, it is strongly recommended not to use font size changing commands such as `\large` and `\small` in main text, because they are quite harmful for 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 keeping spaces between baselines as same as `\normalsize`. An example of `\small*` is shown in 4.2, and that of `\footnotesize*` is in this page.

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 efforts on describing sentences. For example, avoiding long in-text formulas and `\verb` will take great effect. 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 put 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.

4.8 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 `\[` and `\]` pair or one of the environments `displaymath`, `equation` and `eqnarray`. These commands/environments indent formulas (not make centered) and keep fixed baselines as follows.

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

• `eqnarray` environment

For a sequence of two or more related formulas (equations), use `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 into two pages. If an `eqnarray` has many lines and you want to break page in it, add the option `[s]` as `\begin{eqnarray}[s]`.

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

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

• Special Fonts

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

4.9 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 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, the line breaking by adding `\\` to have more beautiful result especially in case of two line captions as shown in **Fig. 1**.

Figure 2 shows how to make double column figure.

You may use any size of fonts as shown in **Fig. 2**. Also you may include a 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 L^AT_EX 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. 2**. Unfortunately, this switching is too hard to do automatically, and you

must use `\figref{<label>}` in such cases.

4.10 Tables

A table with many rules is not very beautiful. **Table 1** shows an example of table with rules of standard style. 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`. The reference to a table should be made by `\tabref{<label>}`.

4.11 Itemizing

There are four *families* of three L^AT_EX standard itemizing environments, `enumerate`, `itemize` and `description`, as follows.

• `enumerate`, `itemize`, `description`

Similar to L^AT_EX standard environment except for wider indentation. The indentation of `enumerate` is three times as wide as `\parindent`, while those of others are twice. The labels of `enumerate` are not those of L^AT_EX 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 1 to find out examples of each environment in this guide.

4.12 Keeping Fixed Baselines

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

Table 1 Sections and sub-sections in which list-like environments are used (example of table)

	enumerate	itemize	description
type-1	2	3	4.5
type-2	—	4.11	4.7
type-3	2	—	4.5
type-4	—	4.8	4.3
type-1:	<code>enumerate</code> , etc.		
type-2:	<code>enumerate*</code> , etc.		
type-3:	<code>Enumerate</code> , etc.		
type-4:	<code>ENUMERATE</code> , etc.		

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

```

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

```

Fig. 2 Double column figure

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

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.

4.13 Footnotes

The command `\footnote` produces footnotes with marks like ¹ and ², resetting number of footnote marks to one after page breaking. This automatic adjustment of footnote marks, however, usually requires to run $\text{\LaTeX}$ twice. (See p. 156 of $\text{\LaTeX}$ Book².)

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

4.14 Citations

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

Goosens explained details of $\text{\LaTeX}$ `\cite{latex}` in `\Cite{companion}`. will produce

Goosens explained details of $\text{\LaTeX}$ ² in 1). as the result.

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

```
\multiCite{\langle 1st-label \rangle}{\langle last-label \rangle}
```

An example of footnote.
Another footnote.

```
\multicite{\langle 1st-label \rangle}{\langle last-label \rangle}
```

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

4.15 References

References should be arranged in alphabetical or cited order. It is strongly recommended to use $\text{BiB}\text{\TeX}$ and style files `ipsjsort.bst` (alphabetical order) or `ipsjunsort.bst` (cited order) to make references fit to the traditional style. You will be given hints by examining the sample bibliography file `bibsample.bib` and the references of this guide which produced by $\text{BiB}\text{\TeX}$ with `ipsjunsort` style. Remember that you must include `.bbl` file in the file package, instead of `.bib`.

If you cannot use $\text{Bib}\text{\TeX}$ and have to make references manually using `thebibliography` environment, observe the references of this guide carefully and follow its style⁴.

4.16 Acknowledgments and Appendices

If you want to acknowledge to some people, put your acknowledgments just before references and enclose them in `acknowledgment` environment. Acknowledgments in drafts will be put into the last page separately.

Appendices, if any, should be just follows 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 the title to `\appendix` as its optional argument, like `\appendix[\langle title \rangle]`.

4.17 Biography

Biographies of authors must be put just before `\end{document}` and have the following format.

```

\begin{biography}
\author{\langle 1st-author's-name \rangle}

```

This footnote appears right column while its mark is in left column. See the source file to know how to do it.

⁴ The references of this guide is produced by `thebibliography` environment to make the source single file, but the contents are produced by $\text{BiB}\text{\TeX}$.

```

\biography-of-1st-author}
\author{\biography-of-2nd-author}
\end{biography}

```

The first sentence of each biography must not have subjects and be written as if its subject is the author's name, e.g. "was born in 1956." The biographies are not printed in draft versions.

4.18 Estimation of Pages

Roughly speaking, two pages of a draft version are packed into one page of its final version. For example, the source of this guide produces 16 page draft excluding acknowledgments and 8 page final version, showing the estimation works.

Better estimation, of course, can be obtained by typesetting your draft using final version style.

5. Concluding Remarks

We don't dream that the style files are perfect, but wish to improve them with your co-operation and hope you let us know your complaintment, comments, suggestions by e-mail to texnicians@ipsj.or.jp.

T_EXnical questions also welcome to this address, but other questions on the Journal/Transactions should be received by

editt@ipsj.or.jp.

Acknowledgments We would like to express our thanks to Sanbi Printing Corp, ULS and Company, and all those authors who voluntarily cooperate with us in the experimental L^AT_EX publishing of the Journal/Transactions.

References

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Appendix

A.1 PostScript Fonts

Only the following fonts are usable in PostScript files.

Ryumin Light-KL
 Gothic Medium BBB
 Jun 101
 Futo Min A101
 Futo Go B101
 Times-*(RBI)*
 Hlevetica[-*(BO)*]

Courier[-*BO*]
 Helvetica-Narrow[-(*BO*)]
 Symbols Set
 ITC AvantGarde Gothic-(*BDO*)
 Platino[-(*BI*)]
 New Century-Schoolbok[-(*BI*)]
 ITC Bookman[-(*LD*)]
 ITC Zapf Chancery-Mediumitalic
 ITC Zapf Dingbats
(RBI) ::= Roman | Bold | Italic | BoldItalic
(BO) ::= Bold | Oblique | BoldOblique
(BDO) ::= Book | Demi | BookOblique |
 DemiOblique
(BI) ::= Bold | Italic | BoldItalic
(LD) ::= Light | Demi | LightItalic |
 DemiItalic

A.2 Commands for the Transactions

Each Transactions has its own subtitle, abbreviation code and serial number. These information are given by the following command placed before `\begin{document}` of the final version source.

```
\transaction{<abbrev>}{<number>}%
           {<ser-num>}
```

The argument *<abbrev>* must be one of the following, while *<number>* of the issue and *<ser-num>* will be notified by the IPSJ or the Editorial Board of the Transaction.

- PRO (Trans. Programming)
- TOM (Trans. Mathematical Modeling and Its Applications)
- TOD (Trans. Database)
- ACS (Trans. Advanced Computing Systems)
- CVM (Trans. Computer Vision and Image Media)

Note that the *<number>* of the issue does not mean the issue is published in the *<number>*-th month of a year. You may be notified the *<month>*, to be set to the following month counter, by IPSJ or the Editorial Board.

```
\setcounter{month}{<month>}
```

Also note that each Transactions may have a few local typesetting conversions shown in the following sections.

A.2.1 Functions for PRO

An issue of The Transactions on Programming (PRO) have not only regular papers but also the abstracts of the talks given in workshops of SIGPRO. The file for an abstract consists of the materials from `\documentclass` (or `\documentstyle`) to `\maketitle` of the format shown in Section 4.2. That is, the file does not

have main text. Note that the reception and acceptance dates are not necessary but the date of presentation has to be given by;

```
\presented{<year>}{<month>}{<day>}
```

A.2.2 Functions for TOM

The author of a paper included in The Transactions on Mathematical Modeling and Its Applications (TOM) may be instructed to give the date of reception of the revised version of the paper. In this case, the date is given by;

```
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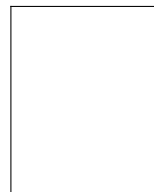
A.2.3 Functions for TOD

The name of the editor in charge for the paper included in The Transactions on Database (TOD) is given by;

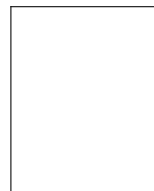
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