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[*Sorry. Ignored \begin{keywords} ... \end{keywords}*]

Abstract

*This guide is for authors who are preparing papers for
Formal Aspects of Computing using the L^AT_EX document
preparation system and the FAC style file.*

1 Introduction

In addition to the standard submission of hard-copy from authors, *Formal Aspects of Computing* accepts machine-readable forms of papers in L^AT_EX. The layout design for *Formal Aspects of Computing* has been implemented as a L^AT_EX style file. The FAC style is based on the ARTICLE style as discussed in the L^AT_EX manual [Error: Reference source not found]. Commands which differ from the standard L^AT_EX 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^AT_EX manual itself. Authors planning to submit their papers in L^AT_EX are advised to use `fac.sty` as early as possible in the creation of their files.

1.1 Introduction to L^AT_EX

L^AT_EX is constructed as a series of macros on top of the T_EX typesetting program. L^AT_EX adds to T_EX a collection of facilities which simplify typesetting for authors by allowing them to concentrate on the logical structure of the document rather than its visual layout. Careful use of the L^AT_EX mark-up philosophy results in uniform layout rather than the ad hoc results of some word-processing systems. Authors are advised to let the defaults control font selection, *etc.* rather than tinker themselves.

L^AT_EX provides a consistent and comprehensive document preparation interface. There are macros for generating a table of contents, lists of figures and/or tables; L^AT_EX can automatically number list entries, equations, figures, tables, and footnotes, as well as parts, sections and subsections. Using this numbering system, bibliographic citations, page references and cross references to any other numbered entity (*e.g.* sections, equations, figures, list entries) are straightforward.

1.2 The FAC Document Style

The use of document styles allows a simple change of style (or style option) to transform the appearance of your document. The Springer-Verlag London Limited (SVL) FAC style file preserves the standard L^AT_EX interface such that any document which can be produced using the standard L^AT_EX `ARTICLE` style, can also be produced with the FAC style. However, the measure (or width of text) is wider than the default for `ARTICLE` therefore line breaks will change and long equations may need re-setting. Authors are urged to use `fac.sty` from the beginning of their document preparation; in particular, they are advised not to use wider measures as given by `a4.sty`, *etc.* because this will involve changes after they think their submissions are technically accurate.

1.3 General Style Issues

Use of L^AT_EX defaults will result in a pleasing uniformity of layout and font selection. Authors should resist the temptation to make *ad hoc* changes to these. Whether using the default fonts or not, displayed mathematics should be set in a distinct font from running text and the same font should be used where formulae occur in running text. In addition to the standard T_EX and L^AT_EX fonts, authors can use the AMS *msxm* and *msym* fonts. The AMS *msym* fonts have been used in Table 1 to define some of the characters in the first four lines.

The final makeup will use Times Roman fonts and if these are available to authors (*e.g.* via PSLaTeX) they should be employed in order to ensure good use of space (they are in general more economical than computer modern fonts).

For general style issues, authors are referred to the ‘Instructions for authors’ in the FAC journal. Authors who are interested in the detail of style are referred to [Error: Reference source not found] and [Error: Reference source not found]. The language of the journal is British English and spelling should conform to this.

Use should be made of symbolic references (`\ref`) in order to protect against late changes of order, *etc.*

1.4 Submission of L^AT_EX Articles to the Journal

Authors who intend to submit a L^AT_EX article to FAC should obtain a copy of the journal’s style file `fac.sty`. This is available on request in the first instance from Springer-Verlag London Limited; remember to specify the type of media you require. Alternatively, you can download the file from the Aston T_EX archive at `uk.ac.tex` on JANET. The files `fac.sty` and `facguide.tex` will be found in the directory `[TEX-ARCHIVE.LATEX.CONTRIB.PUBLICATIONS]`. If you cannot obtain the journal style file, use `ARTICLE` style.

When submitting the final article, ensure that the following are included:

1. Hardcopy printout of the article;
2. The input file;

3. A copy of all user-defined macros;
4. Bibliography files, or if you have used $\text{BIB}\text{T}_\text{E}\text{X}$, the `.bib` and `.bbl` files;
5. Any other files necessary to prepare the article for typesetting.

The files for the *final* article should be text-only with no system dependent control codes. Submit this, if at all possible, by e-mail over JANET, and the hardcopy by post to D.J. Cooke (see the inside-cover of the journal for correct e-mail and postal addresses). If you do not have access to e-mail, send the files on disc – PC in. or Apple in. – along with the hard copy to D. J. Cooke.

2 Using the FAC Style

First, copy the file `fac.sty` into an appropriate subdirectory on your system. The FAC document style is implemented as a complete document style *not* a document style option. In order to use the FAC style, replace `article` by `fac` in the `\documentstyle` command at the beginning of your document:

```
\documentstyle{article}
```

is replaced by,

```
\documentstyle{fac}
```

In general, the following standard document style options should *not* be used with the FAC style:

- `10pt`, `11pt`, `12pt` – unavailable.
- `draft`, `twoside` (no associated style file) – `twoside` is the default.
- `fleqn`, `leqno`, `titlepage`, `twocolumn` – should not be used (`fleqn` is already incorporated into the FAC style).

However, `proc`, `ifthen`, `bezier` – can be used if necessary.

3 Additional Facilities

In addition to all the standard $\text{L}^{\text{A}}\text{T}_\text{E}\text{X}$ design elements, the FAC style includes the following features:

- Extended commands for specifying a short version of the title and author(s) for the running headlines.
- `\correspond` and `\makecorrespond` commands for printing the name and address for further correspondence.
- A `keywords` environment.
- A `proof` environment.

- Control of enumerated lists.

In general, once you have used the additional `fac.sty` facilities in your document, do not process it with a standard L^AT_EX style file.

3.1 Titles and Author's Name

In the FAC 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, which should not be more than 48 characters and spaces, and an alternative short author's name, the standard `\title` and `\author` commands have been extended to take an optional argument to be used as the running headline:

```
\title[Formal Aspects of Computing: \LaTeX\ submissions]
      {Formal Aspects of Computing:\
      \LaTeX\ Style Guide for Authors}
```

and,

```
\author[C. Notarmarco and R. Mulvey]
      {Christiane Notarmarco1 and Rod Mulvey2\
      1Springer-Verlag London Limited, Springer
House,
      Wimbledon, SW19 7JZ, UK;\
      2TeX-to-type,
      Cambridge University Press, Shaftesbury Road,
      Cambridge,\
      UK}
```

You may wish to add a `\thanks` note, which produces a footnote to the title or author. In the latter case, the superscripts by the authors' names will be automatically generated.

3.2 Correspondence Note

The footnote at the bottom of the first page is generated automatically, and begins with the words *Correspondence and offprint requests to:*. The appropriate name and address must be given as an argument to the macro `\correspond` in the preamble:

```
\correspond{Christiane Notarmarco, Springer-Verlag
            London Limited, Springer House, 8
Alexandra
            Road, Wimbledon, London, SW19 7JZ, UK.}
```

This information is subsequently used by the command `\makecorrespond`. This may be placed anywhere after `\begin{document}` within the text of the first

page. If you have other footnotes on the first page, `\makecorrespond` should follow them so as to make *Correspondence and ...* print at the foot of the page.

If you omit the `\correspond` and `\makecorrespond` commands, the name in the correspondence note defaults to the short author's name.

3.3 Keywords and Abstracts

At the beginning of your article, the title should be generated in the usual way using the `\maketitle` command. Immediately following the title you should include a list of keywords followed by an abstract. For example, the titles for this guide were produced by the following source:

```
\maketitle
\begin{keywords}
  \LaTeX; Style files; \verb"fac.sty"; Sample text;
  User guide
\end{keywords}

\begin{abstract}
  This guide is for authors who are preparing papers
  for {\em Formal Aspects of Computing\} using the
  \LaTeX\ document preparation system and the FAC
style
  file.
\end{abstract}

\section{Introduction}
...
```

The abstract is automatically followed by a 12 pica rule.

3.4 Proofs

The `proof` environment has been added to the standard L^AT_EX constructs to provide a consistent format for proofs. For example,

```
\newtheorem{theorem}{Theorem}[section]
...
\begin{theorem}
   $\forall S \rightarrow FP$  for program {\em Multi-States}.
\end{theorem}
\begin{proof}
  Noting that a state satisfying  $\forall S$  has no elements
 $V_{xi}$  of  $S$  satisfying  $0 < V_{xi} < 1$ , it follows
  that the proof is just as the proof was for the
  corresponding case of {\em Bi-States}.
\end{proof}
```

produces the following text:

Theorem 3.1 $VS \Rightarrow FP$ for program Multi-States.

```
[Sorry. Ignored \begin{proof} ... \end{proof}]
```

3.5 Lists

The FAC style provides the three standard list environments:

- Numbered lists, created using the `enumerate` environment.
- Bulleted lists, created using the `itemize` environment.
- Labelled lists, created using the `description` environment.

The enumerated list numbers each list item with an arabic numeral. Alternative styles can be achieved by inserting a redefinition of the number labelling command after the `\begin{enumerate}`. For example, a list numbered with roman numerals inside parentheses can be produced by the following commands:

```
\begin{enumerate}
  \renewcommand{\theenumi}{(\roman{enumi})}
  \item first item
  :
\end{enumerate}
```

This produces the following list:

1. first item
2. second item
3. *etc...*

In the last example, the labels were pushed out into the margin because the standard list indentation is designed to be sufficient for arabic numerals rather than the longer roman numerals. In order to enable different labels to be used more easily, the `enumerate` environment in the FAC style can be given an optional argument which (like a standard `bibliography` environment) specifies the *widest label*. For example,

- ```
[(iii)]
1. first item
2. second item
3. etc...
```

was produced by the following input:

```
\begin{enumerate}[(iii)]
 \renewcommand{\theenumi}{(\roman{enumi})}
 \item first item
```

```
 :
\end{enumerate}
```

## 4 Some Guidelines for Using Standard Facilities

The following notes may help you achieve the best effects with the FAC style file.

### 4.1 Sections

L<sup>A</sup>T<sub>E</sub>X provides five levels of section headings and they are all defined in the FAC style file:

- `\section`
- `\subsection`
- `\subsubsection`
- `\paragraph`
- `\subparagraph`

Section numbers are given for sections, subsection and subsubsection headings.

### 4.2 Running Headlines

As described above, the title of the article and the author's name (or authors' names) are used as running headlines at the top of every page. The `\pagestyle` and `\thispagestyle` commands should *not* be used. Similarly, the commands `\markright` and `\markboth` should not be necessary.

### 4.3 Illustrations (or Figures)

The FAC 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. See 'Instructions for authors' in FAC journal for submission of artwork. Figure captions should be below the figure itself therefore the `\caption` command should appear after the figure or space left for an illustration. For example, Figure 1 is produced using the following commands:

```
\begin{figure}
 \centering
 \vspace{5cm}
 \caption{An example figure in which space has been
 left for the artwork}
 \label{sample-figure}
\end{figure}
```

Figure 1: An example figure in which space has been left for the artwork

## 4.4 Tables

Table 1: Index of Symbols

| Symbol             | Meaning                          |
|--------------------|----------------------------------|
| $\rightsquigarrow$ | Rule closure constructor         |
| $\Delta$           | Substitution sum                 |
| $\cdot$            | Substitution composition         |
| $\sqcup$           | Substitution join                |
| $\perp$            | Coherence relation               |
|                    | Substitution operator (exponent) |
|                    | Substitution operator (Whale)    |
|                    | Substitution operator (Turtle)   |

The FAC style 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. Table captions should be at the top, therefore the `\caption` command should appear before the body of the table.

The `tabular` environment should be used to produce ruled tables; it has been modified for the FAC style in the following ways:

1. Rules may either be two-thirds or the full width of a page, depending on the width of the material in your table. `\hline` will produce a rule two-thirds the width and `\fullhline` will produce a rule the full width of a page;
2. Additional vertical space is inserted on either side of a rule;
3. Vertical lines are not produced.

Commands to redefine quantities such as `\arraystretch` should be omitted. For example, Table 1 is produced using the following commands:

```
\begin{table}
 \caption{Index of Symbols}
 \begin{tabular}{ll}
 \hline
 Symbol\hspace{1cm} & Meaning \\
 \hline
 % \whbl & \hbox{Forward closure} \\
 % \blwh & \hbox{Backward closure} \\
 \end{tabular}
\end{table}
```



```

% \blbl & \hbox{Overlap closure} \\
% \whwh & \hbox{Rule closure} \\
\leadsto & \hbox{Rule closure constructor}
\\
\bigtriangleright & \hbox{Substitution sum} \\
...
$T_n(-,-,-)$ & \hbox{Substitution operator}
(Turtle)} \\
\hline
\end{tabular}
\label{symbols}
\end{table}

```

## 4.5 Displayed Mathematics

The FAC style will set displayed mathematics with the correct indent provided you use the L<sup>A</sup>T<sub>E</sub>X standard of open and closed square brackets as delimiters. The following equation

was typeset in the FAC style using the commands:

```
\[\sum_{i=1}^p \lambda_i = {\rm trace}({\bf S}) \]
```

Note the difference between the positioning of this equation and of the following centred equation

which was (wrongly) typeset using double dollars as follows:

```
$$ \alpha_{j+1} > \bar{\alpha} + k s_{\alpha} $$
```

## 4.6 Bibliography

References to published literature should be quoted in text by an abbreviation in square brackets of name(s) (three letters) and date (two digits). See examples below for style. This is consistent with the BibT<sub>E</sub>X bibliography style ‘alpha.’ Where more than one reference is cited having the author(s) and date, the letters a,b,c, ... should follow the date (*e.g.* [Smi88a], [Smi88b], *etc.*). References should be listed in the `thebibliography` environment alphabetically by author(s)’ name(s) and then by year if the same author has several papers.

The following listing shows some references prepared in the style of the journal:

```

\begin{thebibliography}{Lam86}
\bibitem[But81]{But:Copy}

```

```

Butcher, J.:
{\em Copy-editing: The Cambridge Handbook.}
Cambridge University Press, 1981.

\bibitem[Chi69]{Chicago}
{\em The Chicago Manual of Style.}
University of Chicago Press, Chicago 60637, USA,
1982.

\bibitem[For84]{For:Program}
Forgaard, R.:
A Program for Generating and Analyzing Term Rewriting
Systems,
Master's Thesis, MIT Lab. for Computer Science, 1984.

\bibitem[JLR82]{Jou:Recursive}
Jouannaud, J. P., Lescanne, P. and Reinig, F.:
Recursive Decomposition Ordering,
{\em Proc.\ Conf. on Formal Description of
Programming
Concepts II}, \,pp.\ 331--346, 1982.

\bibitem[Lam86]{Lam:LaTeX}
Lampport, L.:
{\em LaTeX: A Document Preparation System.}
Addison-Wesley, New York, 1986.

\bibitem[Ped85]{Ped:Obtaining}
Pederson, J.:
Obtaining Complete Sets of Reproductions and
Equations
without Using Special Unification Algorithms.
Unpublished manuscript, 1985.

\bibitem[PeS81]{Pet:Complete}
Peterson, G. E. and Stickel, M. E.:
Complete Sets of Reductions for Some Equational
Theories. {\em J.\ ACM}, {\bf 28}, 223--264 (1981).
\end{thebibliography}

```

This produces the following references:

## References

- [But81]Butcher, J.: *Copy-editing: The Cambridge Handbook*. Cambridge University Press, 1981.
- [Chi69]*The Chicago Manual of Style*. University of Chicago Press, Chicago 60637, USA, 1982.
- [For84]Forgaard, R.: A Program for Generating and Analyzing Term Rewriting Systems, Master's Thesis, MIT Lab. for Computer Science, 1984.

- [JLR82]Jouannaud, J. P., Lescanne, P. and Reinig, F.: Recursive Decomposition Ordering, *Proc. Conf. on Formal Description of Programming Concepts II*, pp. 331–346, 1982.
- [Lam86]Lamport, L.: *LaTeX: A Document Preparation System*. Addison-Wesley, New York, 1986.
- [Ped85]Pederson, J.: Obtaining Complete Sets of Reproductions and Equations without Using Special Unification Algorithms. Unpublished manuscript, 1985.
- [PeS81]Peterson, G. E. and Stickel, M. E.: Complete Sets of Reductions for Some Equational Theories. *J. ACM*, **28**, 223–264 (1981).