How to Prepare Articles for Fundamenta Informaticae

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Abstract. This guide is for authors who are preparing papers for *Fundamenta Informaticae* using the LaTeX 2_ε document preparation system and the `fundam.cls` class file.

Keywords: LaTeX 2_ε, document class file, BibTeX

1. Introduction

The *Fundamenta Informaticae* class file is based on the standard LaTeX 2_ε `article` class as described in the LaTeX manual. It means that the paper prepared to be process with the standard `article` class can be processed with the `fundam` class without significant modifications. Commands which differ from the standard LaTeX interface, or which are provided in addition to the standard interface, are explained in this guide. This guide is not a substitute for the LaTeX manual itself.

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[*]Thanks for something to somebody

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The `fundam` class can be used only with LATEX 2$_\varepsilon$. It is not supposed to work with the obsolete 2.09 (or earlier) version of LATEX. The preferred format to be used is pdfLATEX (compilation directly to PDF).

The newest version of *Fundamenta Informaticae* class (`fundam.cls` v. 2.0) as well as the newest version of bibliography style (`fundam.bst`) have been published in December 2016. If you have an earlier version of these files, you should update immediately. Version 2.0 of the class sets by default the page size to 262 by 192 mm, which is the actual page size of printed *Fundamenta Informaticae*.

1.1. The `fundam` **document class**

The use of document styles allows a simple change of style (or style option) to transform the appearance of the document. The `fundam` class file preserves the standard LATEX interface such that any document which can be produced using the standard LATEX `article` class, can also be produced with the `fundam` style. However, the measure (length and width of text) is different to that used in `article` therefore line breaks will change and long equations may need re-setting.

The authors are encouraged to minimize the manual line and page breaks in the manuscripts.

It is essential that you do not modify `fundam.cls`. When additional macros are required, place them in a separate file with the filename extension `.sty` (e.g. `mymacros.sty`) and load it as additional package file:

```
\usepackage{mymacros}
```

In this way you will distinguish clearly between the main style file and your own macros, which can then be found easily by the journal editor. Do not forget to submit your optional style file for publication along with your input file.

2. Using the `fundam` **class**

First, copy the file `fundam.cls` (and `fundam.bst` if you are using BibTEX) into the correct subdirectory on your system. In order to use the **fundam** class, place it as the argument of the `\documentclass` command at the beginning of your document. That is,

```
\documentclass{article}
```

is replaced by

```
\documentclass{fundam}
```

Do not use any document style options.

The class uses macros from standard LATEX 2$_\varepsilon$ packages: `theorem` and `amsmath`. The page layout is set using two more standard LATEX 2$_\varepsilon$ packages: `geometry` and `fancyhdr`. These packages are included in every recent LATEX 2$_\varepsilon$ distribution.

2.1.   Title, authors and other meta information

The title of the paper should be specified with the standard `\title` command. The names and affiliation and address information of the authors should be specified using `\author` command. The consecutive authors should be separated by `\and` command. The information for every author can contain more than one line. The lines should be separated by `\\` command. The first line is regarded as the name of the author, next lines should contain address/affiliation information.

It is possible to place the authors in two columns – it can be useful when the paper has three, four of more authors. Two column placement of author information is activated after using the `manyauthors` option in the invocation of class:

```
\documentclass[manyauthors]{fundam}
```

The acknowledgement information can be assigned to authors using standard `\thanks` command placed after the name of the author (inside `\author` command). If two authors have the same acknowledgement information, than the first author should be marked with `\thanks` command, the others should be marked with the `\thanksas{<number>}`. The examples of using these commands are shown below.

The corresponding author can be marked with the `\corresponding` command placed after his name. This command produce the footnote marked with the capital "C" as the superscript and the text: "Corresponding author" – it means that the paper should be sent to the marked author for corrections.

Optionally the correspondence address can be specified separately with `\address` command placed after `\maketitle` command. The example of the beginning of the paper written by the four authors is shown below.

```
\documentclass[manyauthors]{fundam}
\begin{document}
\title{The example paper}
\author{First Author\thanks{Thanks for something}\\
  Institute of Informatics \\
  University of Somewere
\and Second Author\thanks{For something else}\\
  Department of Informatics \\
  University of Some other Place
\and Third Author\thanksas{2}\\
  Department of Teleinformatics \\
  Nowhere University
\and Fourth Author\thanksas{1}\\
  Department of Applied Mathematics \\
  Somewere University of Technology}
\maketitle
\address{F. Author, Institute of Informatics, University of Somewhere}
```

Running head must be defined with the two argument command `\runninghead` – the first argument should contain the names of the authors, second one should contain shortened version of title. The issue number and year must be specified with help of the `\issue` command, and the starting page can be changed by setting the value of the counter page to the proper value as in the following example:

```
\setcounter{page}{1001}
\issue{XXI~(2001)}
\runninghead{F. Author, S. Author}{How to Prepare Articles for FI}
```

The issue and page number must be specified before the `\maketitle` command. The running head must be defined on the first page of the paper.

2.2.   Sections

LaTeX provides five levels of section headings and although they are all defined in the `fundam` style file, only the first four should be used.

- Heading A – `\section`;

- Heading B – `\subsection`;

- Heading C – `\subsubsection`;

- Heading D – `\paragraph`;

- Heading E – `\subparagraph` should not be used.

2.3.   Lists

The `fundam` class provides the three standard list environments:

- Numbered lists, created using the `enumerate` environment.

- Unnumbered 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 labeling 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\labelenumi{\theenumi}
 \renewcommand{\theenumi}{(\roman{enumi})}
 \item first item
```

```
    \item second item
    \item etc\dots
  \end{enumerate}
```

This produces the following list:

(i) first item

(ii) second item

(iii) etc...

2.4. Formulæ and equations

Standard LaTeX environments (`equation` and `eqnarray`) for typesetting equations can be used in the articles. The numbering of equation is performed by LaTeX. These environments were used to typeset formulae (1), (2) and (3)

$$a + b = c \tag{1}$$
*

$$\begin{aligned} a + b &= c \\ c - b &= a \end{aligned} \tag{2,3}$$
(!)

Because the `amsmath` package is included by the `fundam` class, the author can use the $\mathcal{AMS}$-TeX macros for better handling of multi line formulae as shown in the examples (4)–(7). For details refer to the standard $\mathcal{AMS}$-LaTeX documentation.

$$\begin{aligned} a + b = c \\ c - b = a \end{aligned} \tag{4,5}$$
(*a*)

$$\begin{aligned} a + b = c \\ c - b = a \end{aligned} \tag{6,7}$$
(∗)
(∗∗)

In addition to the standard numbering the equations can be marked with extra tags placed on the left margin. The `\ltag{}` command is provided for such a purpose. The mandatory argument of this command typeset in math mode is used as the tag. The equation (7) was for instance marked with command `\ltag{(**)}`.

2.5. Theorem like environments and proofs

The `fundam` class defines ready to use environments for typesetting typical theorem like environments: `definition`, `theorem`, `fact`, `lemma`, `example`, `assumption`, `proposition`, `remark`, `corollary`, `claim`. There is also defined the `proof` environment. An example of using this environment is given below (theorem 2.1):

```
\begin{theorem}[trivial]
There exist numbers $a$, $b$, and $c$, such that $2a+2b=2c$.
\end{theorem}
\begin{proof} We leave the proof for the reader.
\end{proof}
```

Theorem 2.1. (trivial)
There exists numbers a, b, and c, such that $2a + 2b = 2c$.

Proof:
We leave the proof for the reader.   □

You can define more theorem like environments if you need them using the \newtheorem com-mand.

2.6.   Figures, tables, and algorithms

The figure and table environments are inherited from the standard article class as described in the LATEX Manual to provide consecutively numbered floating inserts for illustrations and tables respec-tively.

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}
  ...
  \caption{An example figure with space for artwork.}
  \label{sample-figure}
\end{figure}
```
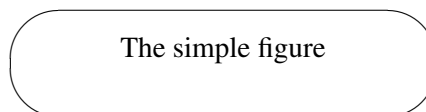
The simple figure

Figure 1.   An example figure with space for artwork.

The preferred method of preparing figures is to save or convert them to the Portable Document Format (PDF) or a popular graphic format such as PNG (alternatively JPG, GIF). Such pictures can be included in consistent way and easily scaled. The graphicx package can be used to include graphics into the paper. It provides the command \includegraphics as well as an easy way of resizing the picture using the optional, key-value parameters.

```
\includegraphics[width=0.5\textwidth]{file.pdf}
```

The above example presets the use of \includegraphics command as provided by the graphicx package. The included picture will be resized to the half width of the typesetting area. If you not specify the height of the picture it will be scaled proportionally.

Table captions should be at the top therefore the \caption command should appear before the body of the table. For example, Table 1 is produced using the following commands:

```
\begin{table}[htbp]\small
  \caption{An example table}
  \label{sample-table}
  \begin{center}
  \begin{tabular}{|c|c|c|}
\hline
$m$ & $z_\kappa$ & $s_\kappa$\\\hline
10& 1.13641 & 1.27700  \\\hline
20& 1.06601 & 1.27801  \\\hline
  \end{tabular}
\end{center}
\end{table}
```

Table 1.   An example table

m	z_κ	s_κ
10	1.13641	1.27700
20	1.06601	1.27801

The tabular environment should be used to produce ruled tables. Commands to redefine quantities such as \arraystretch should be avoided.

Algorithm 1: Example – MAX finds the maximum number

Input: A finite set $A = \{a_1, a_2, \ldots, a_n\}$ of integers
Output: The largest element in the set
$max \leftarrow a_1$;
for $i \leftarrow 2$ **to** n **do**
$\quad$ **if** $a_i > max$ **then**
$\quad\quad$ $max \leftarrow a_i$;
$\quad$ **end**
end
return max;

The (pseudo)code of algorithms should be placed in the algorithm environment. We recommend the use of standard algorithm2e package included in most LaTeX 2_ε distributions. By calling in the

preamble `\usepackage[ruled,lined]{algorithm2e}` one can introduce an algorithm as shown in Algorithm 1.

2.7. Bibliography

Place citations as numbers in square brackets in the text. All publications cited in the text should be presented in a list of references at the end of the manuscript. List the references in the order in which they appear in the text. Only articles published or accepted for publication should be listed in the reference list. Submitted articles can be listed as (author(s), unpublished data). If an article has a DOI (Digital Object Identifier), this should be provided after the page number details. The number is added after the letters 'doi'. Manuscripts will not be considered if they do not conform to the Vancouver citation guidelines outlined above.

The best way to prepare bibliography for your paper is to use the BibTEX program. This will assure uniform citation format and provide means for better recognition of cited work. We assume that you know how to use the BibTEX program. If not, consult the LATEX manual. The special BibTEX style `fundam.bst` is provided with the LATEX class. The use of `fundam.bst` style assures compliance with Vancouver citation style. Assuming that your BibTEX database file is named `citations.bib` you should add the following two lines to your manuscript file. The citations should be defined with `\cite` command. Here we cite the first two bibliographical entries [1, 2].

Authors are encouraged to include as much information in BibTEX records as possible. In particular the unique identifiers like DOI, arXiv number, URL or ISBN are useful.

```
\bibliographystyle{fundam}
\bibliography{citations}
```

The manual formatting of your reference list is **highly discouraged**. We strongly recommend that you ask your system personnel to install BibTEX.

If you cannot use BibTEXfor some reason, you must prepare your bibliography manually, as the `thebibiliography` environment. For example, the bibliography of this guide can be produced manually as follows:

```
\begin{thebibliography}{1}
\providecommand{\url}[1]{\texttt{#1}}
\providecommand{\urlprefix}{URL }
\expandafter\ifx\csname urlstyle\endcsname\relax
  \providecommand{\doi}[1]{doi:\discretionary{}{}{}#1}\else
  \providecommand{\doi}{doi:\discretionary{}{}{}\begingroup
  \urlstyle{rm}\Url}\fi
\providecommand{\eprint}[2][]{\url{#2}}

\bibitem{RSFDGrC}
{RSFDGrC}.
\newblock {International Conference on Rough Sets, Fuzzy Sets, Data Mining, and
  Granular-Soft Computing}.
\newblock \url{http://dblp.uni-trier.de/db/conf/rsfdgrc/index.html}.
```

```
\newblock Accessed: 2015-08-29.

\bibitem{KrasuskiJSS13}
Krasuski A, Jankowski A, Skowron A, \'{S}l\c{e}zak D.
\newblock {From Sensory Data to Decision Making: {A} Perspective on Supporting
  a Fire Commander}.
\newblock In: 2013 {IEEE/WIC/ACM} International Conferences on Web Intelligence
  and Intelligent Agent Technology, Atlanta, Georgia, USA, 17-20 November 2013,
  Workshop Proceedings \cite{DBLP:conf/iat/2013w}, 2013 pp. 229--236.
\newblock \doi{10.1109/WI-IAT.2013.188}.
\newblock
  \urlprefix\url{http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=6690661}.

\bibitem{Wittgenstein}
Baker G, Hacker P.
\newblock Wittgenstein: Understanding and Meaning, Volume 1 of an Analytical
  Commentary on the Philosophical Investigations, Part II: Exegesis 1-184.
\newblock Wiley-Blackwell Publishing, 2004.
\newblock ISBN 9780470753101.
\newblock \doi{10.1002/9780470753101}.
\newblock 2nd Edition.

\bibitem{SzczukaSKK14}
Szczuka MS, Sosnowski L, Krasuski A, Krenski K.
\newblock Using Domain Knowledge in Initial Stages of {KDD:} Optimization of
  Compound Object Processing.
\newblock \emph{Fundamenta Informaticae}, 2014.
\newblock \textbf{129}(4):341--364.
\newblock \doi{10.3233/FI-2014-975}.

\bibitem{DBLP:conf/iat/2013w}
2013 {IEEE/WIC/ACM} International Conferences on Web Intelligence and
  Intelligent Agent Technology, Atlanta, Georgia, USA, 17-20 November 2013,
  Workshop Proceedings. {IEEE} Computer Society, 2013.
\newblock ISBN 978-1-4799-2902-3.
\newblock
  \urlprefix\url{http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=6690661}.

\end{thebibliography}
```

References

[1] RSFDGrC. International Conference on Rough Sets, Fuzzy Sets, Data Mining, and Granular-Soft Computing. http://dblp.uni-trier.de/db/conf/rsfdgrc/index.html. Accessed: 2015-08-29.

[2] Krasuski A, Jankowski A, Skowron A, Ślęzak D. From Sensory Data to Decision Making: A Perspective on Supporting a Fire Commander. In: 2013 IEEE/WIC/ACM International Conferences on Web Intelligence

and Intelligent Agent Technology, Atlanta, Georgia, USA, 17-20 November 2013, Workshop Proceedings [5], 2013 pp. 229–236. doi:10.1109/WI-IAT.2013.188. URL `http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=6690661`.

[3] Baker G, Hacker P. Wittgenstein: Understanding and Meaning, Volume 1 of an Analytical Commentary on the Philosophical Investigations, Part II: Exegesis 1-184. Wiley-Blackwell Publishing, 2004. ISBN 9780470753101. doi:10.1002/9780470753101. 2nd Edition.

[4] Szczuka MS, Sosnowski L, Krasuski A, Krenski K. Using Domain Knowledge in Initial Stages of KDD: Optimization of Compound Object Processing. *Fundamenta Informaticae*, 2014. **129**(4):341–364. doi:10.3233/FI-2014-975.

[5] 2013 IEEE/WIC/ACM International Conferences on Web Intelligence and Intelligent Agent Technology, Atlanta, Georgia, USA, 17-20 November 2013, Workshop Proceedings. IEEE Computer Society, 2013. ISBN 978-1-4799-2902-3. URL `http://ieeexplore.ieee.org/xpl/tocresult.jsp?isnumber=6690661`.