

# Preparation of Papers in Standard IEEE Two-Column Format for the conference "11th IEEE International Conference on Intelligent Engineering Systems 2007, Budapest, Hungary, June 29-July 2, 2007" (INES 2007)

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**Abstract**—In this template paper instructions providing basic guidelines for preparing camera-ready (CR) proceedings-styled papers for TEX users for the conference "INES 2007" are presented. This document itself is an example of the desired layout for CR papers (inclusive of this abstract) therefore it can be used as a template for writing the papers, too. The document contains information regarding desktop publishing format, type sizes, type faces, etc. Style rules are provided to explain how to handle equations, units, figures, tables, references, abbreviations, and acronyms. Sections are also devoted to the preparation of the references and acknowledgements.

The significance of becoming compliant with the "IEEE Xplore" standards is also explained.

Besides these information, for the sake of less experienced or completely unexperienced TEX users useful samples are given to aid them in writing their papers in TEX. In MS WINDOWS environment the freely available "MiKTeX 2.5" (<http://www.miktex.org/>) software can be installed for making documents in TEX format. The softwares "WinEdt 5.4" or "WinEdt 5.5 (pre-release)" available at "<http://www.winedt.com/>" seamlessly cooperate with "MiKTeX 2.5" and support PostScript (PS), Portable Document Format (PDF), and "Device Independent (DVI)" format outputs, too.

## I. TYPICAL UNITS IN DESKTOP PUBLISHING

The basic units generally used are: 1 point (pt) = 0.35 mm = 1/72 in, 1 pica = 12 pt, 1 in = 2,54 cm, 1 cm = 0,393 in. The present paper has to be prepared in full-size format, on A4 paper 21 x 29.7 cm (8.3 x 11.7 in or 50 x 70 picas). Please, do not use 8.5 x 11 inch (letter size) paper settings.

### A. Setting the Basic Formatting Option in TEX

The output must be a file in PDF format that is compatible with the latest standards of IEEE.

The command in the top of this TEX file `\documentclass[10pt, conference, a4paper]{IEEEtran}` sets the appropriate normal fonts and character sizes, the

conference format, and the paper size. (This command refers to the file "IEEEtran.cls" that defines the appropriate "Document Class" to be used, and has to be included in the directory containing the paper in a file of ".TEX" format, the figures in "Encapsulated Postscript (.EPS)" format, and all the other files generated by your text editor in this directory. This single command makes the TEX users get rid of almost all the burden of formatting activities. Only little details have to be cared while preparing the paper as listed below.

For dividing your paper's text to paragraphs within a section or subsection insert at least one empty line into your TEX file. (Including more than one empty line does not have any consequences regarding the format of the resulting paper.) In this case the new paragraph will appear according to its first line's indentation as is preset in the file "IEEEtran.cls". Application of double "backslash" (\\) as is given in this part of the text results in a new paragraph without any indentation.

**Try to achieve the standard double column format with equal column lengths on the last (usually partly empty) page by manually positioning a \newpage command within the document as it is done at Section VI in this particular case.**

### B. Standard Character Sizes

Various predefined font sizes with appropriate line-spacings are available for the document of 10 points normal size, too. The available examples are as follows:

tiny (5 pt),  
scriptsize (7 pt),  
footnotesize (8pt),  
normalsize (10 pt),  
sublargesize (11 pt),  
large (12 pt),

Large (14 pt),  
 LARGE (17 pt),  
 huge (20 pt),  
 Huge (24 pt).

The captions for the figures as well as the bibliographic items under the title "REFERENCES" have their predefined sizes. For table captions the `\footnotesize` command is recommended to achieve 8 pt letter size for the table captions. Possibly avoid the use of letters smaller than 8 pt in your text.

### C. Number of Pages

The maximum number of pages per paper is 6. Do not number your pages.

## II. UNITS

Metric units are preferred for use in IEEE publications in light of their international readership and the inherent convenience of these units in many fields. In particular, the use of the International System of Units (SI Units) is advocated. This system includes a subsystem the MKSA units, which are based on the meter, kilogram, second, and ampere. British units may be used as secondary units (in parentheses). An exception is when British units are used as identifiers in trade, such as, 3.5 inch disk drive.

## III. EQUATIONS

In a TEX document equations may appear in *three essentially different manners*.

If the equations are present in the document *as objects* inserted between the commands `\begin{equation}` ... `\end{equation}` the TEX program automatically numbers them consecutively with equation numbers in parentheses flushed to the right margin, as in (1).

$$\frac{\partial \ddot{y}}{\partial u} = \frac{0.5IDx_1}{x_3x_2^{1/2}} - x_4x_3^{-2} \left( 0.5Fx_1x_2^{-1/2} + G \right) D \quad (1)$$

As any object, the equation object, too, can be labeled by unique labels as e.g. in `\begin{equation}\label{the_label} ... \end{equation}` in which in the place of the string "the\_label" an appropriate string can be substituted. It may imitate numbering as e.g. "eq:10", or may be any common string.

Labeled objects in the text can be referred to by the command `\ref{the_label}` as e.g. in (2). In similar manner, the *bibliographic references* can be *cited* by using the `\cite{the_tag}` command in which the identifying tags of the appropriate items can be given, as e.g. in [3].

If you do not wish to individually number the equations within a group, insert an *array* object into a single equation as recommended below.

$$\begin{aligned} \frac{\partial \ddot{x}_4}{\partial u} &= 0.5Ix_1x_2^{-1/2}D \\ \frac{\partial \ddot{x}_3}{\partial u} &= 0.5Fx_1x_2^{-1/2}D + GD \end{aligned} \quad (2)$$

In this case the whole group will be numbered by a single number. The above example contains only a single column in the array. For multiple columns array use the example given below in which the code `\begin{array}{c}` defines unique arrangement for each column. For instance, in this case letter "c" codes "centering" for the first, letter "l" codes arranging at the left side for the second, and letter "r" prescribes arranging at the right side for the third column. The special symbol "&" within the array codes the separation between the columns. (The `\` symbols code the end of the appropriate line.)

$$\begin{array}{c} Peter & -123.5 & right \\ summerholiday & -5 & 1 \end{array} \quad (3)$$

Of course more than three columns can be present in an array.

Alternative possibility for inserting more than one equation into a group is the application of the object "equation array". The appropriate variant of (2) seems as follows:

$$\frac{\partial \ddot{x}_4}{\partial u} = 0.5Ix_1x_2^{-1/2}D \quad (4)$$

$$\frac{\partial \ddot{x}_3}{\partial u} = 0.5Fx_1x_2^{-1/2}D + GD \quad (5)$$

In this case each equation is ordered according to the common horizontal position of the = symbols, and the elements in each new line are numbered individually. (However, the label now belongs to the whole group. Observe the effect of the reference 4!) Numbering of each individual line of the equation array can be forbidden by applying the `\nonumber` command placed at the beginning of the appropriate line as e.g. in

$$\begin{aligned} \frac{\partial \ddot{x}_4}{\partial u} &= 0.5Ix_1x_2^{-1/2}D \\ \frac{\partial \ddot{x}_3}{\partial u} &= 0.5Fx_1x_2^{-1/2}D + GD. \end{aligned} \quad (6)$$

The object "eqnarray\*" is exempt of any automatic numbering. It normally applies to objects that will not be referred to in the text, consequently they do not need labeling:

$$\begin{aligned} \frac{\partial \ddot{x}_4}{\partial u} &= 0.5Ix_1x_2^{-1/2}D \\ \frac{\partial \ddot{x}_3}{\partial u} &= 0.5Fx_1x_2^{-1/2}D + GD \end{aligned}$$

An alternative way of using equations is their insertion directly within the text's line without numbering and labeling. For this purpose insert the equation between two \$ characters as in the next example:  $\frac{e}{f} = \sin x$ .

To make your equations more compact, you may use the solidus (/), the "exp" function, or appropriate exponents. Italicize Roman symbols for quantities and variables, but not Greek symbols. Use a long dash rather than a hyphen for a minus sign. Use parentheses to avoid ambiguities in the denominator. Punctuate equations with commas or periods when they are part of a sentence.

For matrices use the "array" entity as e.g. in the example below:

$$\begin{bmatrix} y^{(n)}(t - \delta t) \\ \vdots \\ y^{(n)}(t - M\delta t) \end{bmatrix} = \begin{bmatrix} Y_f^T(t - \delta t) \\ \vdots \\ Y_f^T(t - M\delta t) \end{bmatrix}. \quad (7)$$

TABLE I  
TABLE CAPTION

Qty <sub>1</sub>	Qty <sub>2</sub>	Qty <sub>3</sub>
-10.11	$1.3 \times 10^{-2}$	-5.5
-10	$-1.3 \times 10^{-2}$	5.5
-10	$-1.3 \times 10^{-2}$	-5.5

TABLE II  
USING DOUBLE LINES FOR COLUMN SEPARATION

Qty <sub>1</sub>	Qty <sub>2</sub>	Qty <sub>3</sub>
-10	$-1.3 \times 10^{-2}$	5.5

In the equations the "cap" and the "underline" characters are used for the "upper" and the "lower" indices as in  $a_d^c$  or in  $a_d^c$ . If more than one character is to be put into an index use the parentheses { } around the appropriate argument as in the expression  $a^{characters}$ . Big parentheses the size of which is scaled according to the contents between them can be made by the `\left\{`, `\right\}` e.t.c. commands as in the example  $\left[ \begin{array}{cc} a & b \\ c & d \end{array} \right]$ .

#### IV. TABLES

To include tables e.g. the `table` environment and the `tabular` option can be used as in the simple example below. The `\centering` command centers the table within the column. The `\footnotesize` command helps you to use a reduced font size more appropriate to the tables. The table caption has to be located before the table. In the command `\begin{tabular}{|c|l|l|}` the `|` characters stand for the vertical lines, letters "c", "l", or "r" code centering, left and right justification within the appropriate columns, respectively. The `\hline` command yields a complete horizontal line, the `\cline{col1-col2}` commands result in horizontal lines only between the specified columns / in the specified column range (see Table I).

Refer to tables by the command `\ref{TableLabel}` as: "In Table I the use of the tables is defined". The tables are automatically numbered by Roman numbers. You can label the tables as e.g. `table1`, `table2`, etc. Various footnotes can be added to the document as e.g.  $A^1$ ,  $B^2$ .

#### V. FIGURES

Use the abbreviation "Fig. 1," even at the beginning of a sentence. For instance:

"Fig. 1 describing the desired and the achieved  $\ddot{y}$  values vs. time also substantiates this explanation: the smallest "desired acceleration" values occur in the  $\delta t = 0.067$  s case when no drastic correction is needed to the nominal motion."

Figure axis labels are often a source of confusion. Try to use words rather than symbols. As an example, write the quantity "Magnetization," or "Magnetization, M," not just "M." Put units in parentheses. Do not label axes only with units. In

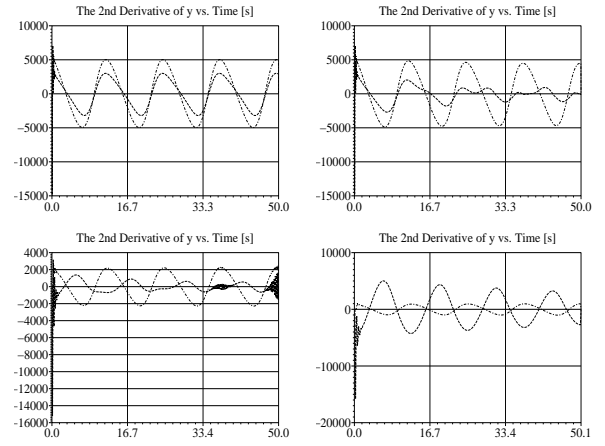


Fig. 1. The Desired (dashed line) and the Actual (dash-dot line)  $2^{nd}$  derivatives for  $\delta t = 0.067/2$  s: non-adaptive (left side), adaptive (right side) ( $1^{st}$  row); For the adaptive control of  $\delta t = 0.067$  s (left side),  $\delta t = 2 \times 0.067$  s (right side) ( $2^{nd}$  row).

the example, write "Magnetization (kA/m)" or "Magnetization ( $\text{kA} \times \text{m}^{-1}$ )", not just "kA/m." Do not label axes with a ratio of quantities and units. For example, write "Temperature (K)," not "Temperature/K." In the TEX files the figures are positioned automatically. Use `labels` and the `"\ref"` command for referring to the figures. Try to use good quality "Encapsulated Postscript (.EPS)" files for inclusion in a figure as is given in the example.

In the IEEE Transactions figure captions are left justified. In the conferences long (longer than one line) captions are left justified, short (single line) captions are centered. The **command in the preamble** `\centerfigcaptionstrue` selects this mode. The command `\centering` cannot be used correctly in the figure captions. Please, refer to the captions at Fig. 1 and Fig. 2!

The `\includegraphics` command makes it possible to include more than one graph in a figure. The `[height=3.00cm, width=4.00cm]` part of the command helps you to find a proper size to the graphics manually. It is expedient to utilize the full available column width.

##### A. How to Obtain Appropriate EPS Pictures?

Several programs as e.g. INRIA's SCILAB support the direct generation of good quality EPS files for presenting the results of computations as diagrams. If one wishes to use various programs for making drawings as figures as e.g. the MS PowerPoint, **making EPS files is only a printing task.**

In a Windows environment one can install any PostScript (PS) printer that can set its output to the following PostScript options: optimized for "EPS" format and can be set to use "Native TrueType Fonts".

The program "AFPL Ghostscript 8.53" and its graphical interface called "GSview 4.8" available at "http://www.cs.wisc.edu/~ghost/" can solve such printing tasks.

<sup>1</sup>This is the footnote for item A.

<sup>2</sup>This is the footnote for item B.

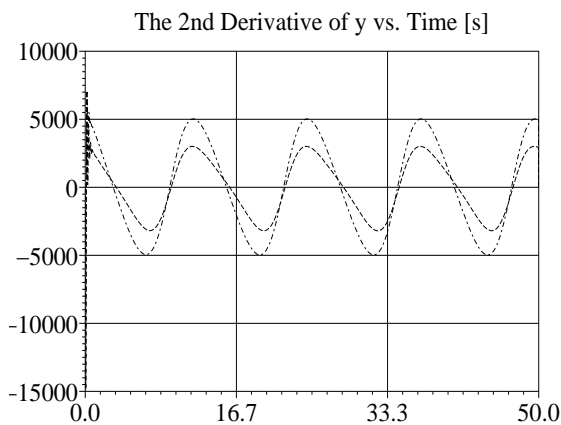


Fig. 2. Short caption.

The free program "FreePDF XP 3.07" e.g. installs a printer that produces files in PDF format and can be set according to the above given PostScript options. (It is available at "http://freepdfxp.de/fpx732.htm"). This program also uses "AFPL Ghostscript 8.53", its output can be converted to EPS by using the services of "GSview 4.8".

#### B. How to Obtain Appropriate PDF Files from the TEX Document?

For general purposes the icon in the upper right region of the menu indicating "*dvi*  $\rightarrow$  *pdf*" conversion can be used within *WinEdt*. The "GSview 4.8" program can also make PDF files from any printout into a file having PostScript format and ".PS" extension.

However, the so obtained files do not necessarily comply with IEEE's strict requirements prescribed for papers to be issued in PDF format in CD proceedings or to be sold / disseminated electronically via the Internet using the IEEE Xplore system. (One of the main points is the high variety of possible parameter settings within a PDF document that is quite independent of the above considered formal issues.)

Before submitting the final version, for MiKTeX users it is highly recommended to compress the final ".DVI" file and the appropriate ".EPS" files into a single ".ZIP" file.<sup>3</sup>

This zipped file can be submitted to the "IEEE PDF eXpress" system that can generate the required PDF file according to the instructions available in the "IEEE Xplore Compliant Guide" at "http://www.trivent.hu/INES2007/". The so obtained contributions can be sold electronically by IEEE via the "IEEE Xplore" systems that increases the possibility of obtaining proper citations for the contribution.

#### C. Abbreviations and Acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, ac, dc, and rms do not have to be defined. Do not use abbreviations in the title unless they are unavoidable (for example, the title of this article).

## VI. CONCLUSION

To achieve approximately equal column lengths on the last page that usually is incompletely filled in, use the `\newpage` command that manually can be positioned within the document.

This is the conclusion of the paper. This is the conclusion of the paper. This is the conclusion of the paper. This is the conclusion of the paper. This is the conclusion of the paper. This is the conclusion of the paper. This is the conclusion of the paper. This is the conclusion of the paper. This is the conclusion of the paper. This is the conclusion of the paper.

#### Acknowledgments

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## REFERENCES

- [1] A. N. Expert, *A Book He Wrote*, His Publisher, City, State, 1989.
- [2] I. M. Author, "Some related article I wrote," *Some Fine Journal*, vol. 10, pp. 90–100, 1994.
- [3] A. Participant, "Some related work she presented," *Some Fine Conference*, City, State, pp. 1010–1020, 1999.

<sup>3</sup>Here is the position of the `\newpage` command the significance of which is explained in Section IV.