

Model Based System Engineering and Internet of Things Applications

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ABSTRACT

Please use this template to test how your figures will look on the printed journal page of the Journal of Mechanical Design. A

Nomenclature

IoT Internet of Things.

α There are two arguments for each entry of the nomemclature environment, the symbol and the definition.

1 Introduction

This article illustrates preparation of ASME paper using \LaTeX 2 ϵ . The \LaTeX macro `asme2ej.cls`, the \BIBTeX style file `asmems4.bst`, and the template `asme2ej.tex` that create this article are available on the WWW at the URL address <http://iel.ucdavis.edu/code/>. To ensure compliance with the 2003 ASME MS4 style guidelines [1], you should modify neither the \LaTeX macro `asme2ej.cls` nor the \BIBTeX style file `asmems4.bst`. By comparing the output generated by typesetting this file and the \LaTeX 2 ϵ source file, you should find everything you need to help you through the preparation of ASME paper using \LaTeX 2 ϵ . Details on using \LaTeX can be found in [2].

In order to get started in generating a two-column version of your paper, please format the document with 0.75in top margin, 1.5in bottom margin and 0.825in left and right margins. Break the text into two sections one for the title heading, and another for the body of the paper.

The format of the heading is not critical, on the other hand formatting of the body of the text is the primary goal of this exercise. This will allow you to see that the figures are matched to the column width and font size of the paper. The double column of the heading section is set to 1.85in for the first column, a 0.5in spacing, and 4.5in for the second column. For the body of the paper, set it to 3.34in for both columns with 0.17in spacing, both are right justified.

The information that is the focus of this exercise is found in section 6. Please use this template to format your paper in a way that is similar to the printed form of the Journal of Mechanical Design. This will allow you to verify that the size and resolution of your figures match the page layout of the journal. The ASME Journal of Mechanical Design will no longer publish papers that have the errors demonstrated here.

ASME simply requires that the font should be the appropriate size and not be blurred or pixilated, and that lines should be the appropriate weight and have minimal, preferably no, pixilation or rasterization.

The journal uses 10pt Times Roman Bold for headings, but Times Bold is good enough for this effort. The text is set at 9pt Times Roman, and again Times will be fine. Insert a new line after the heading, and two lines after each section. This is not exactly right but it is close enough.

Beautiful Figure

Fig. 1. The caption of a single sentence does not have period at the end

2 Very Very Very Very Very Very Very Very Very Very Long Heading

The heading is boldface with upper and lower case letters. If the heading should run into more than one line, the run-over is not left-flushed.

2.1 Second-Level Heading

The next level of heading is also boldface with upper and lower case letters. The heading is flushed left with the left margin. The spacing to the next heading is two line spaces.

2.1.1 Third-Level Heading.

The third-level of heading follows the style of the second-level heading.

3 Use of SI Units

An ASME paper should use SI units. When preference is given to SI units, the U.S. customary units may be given in parentheses or omitted. When U.S. customary units are given preference, the SI equivalent *shall* be provided in parentheses or in a supplementary table.

4 Footnotes¹

Footnotes are referenced with superscript numerals and are numbered consecutively from 1 to the end of the paper². Footnotes should appear at the bottom of the column in which they are referenced.

5 Mathematics

Equations should be numbered consecutively beginning with (1) to the end of the paper, including any appendices. The number should be enclosed in parentheses and set flush right in the column on the same line as the equation. An extra line of space should be left above and below a displayed equation or formula. \LaTeX can automatically keep track of equation numbers in the paper and format almost any equation imaginable. An example is shown in Eqn. (1). The number of a referenced equation in the text should be preceded by Eqn. unless the reference starts a sentence in which case Eqn. should be expanded to Equation.

$$f(t) = \int_{0+}^t F(t)dt + \frac{dg(t)}{dt} \quad (1)$$

6 Figures

All figures should be positioned at the top of the page where possible. All figures should be numbered consecutively and centered under the figure as shown in Fig. 1. All text within the figure should be no smaller than 7 pt. There should be a minimum two line spaces between figures and text. The number of a referenced figure or table in the text should be preceded by Fig. or Tab. respectively unless the reference starts a sentence in which case Fig. or Tab. should be expanded to Figure or Table.

Table 1. Figure and table captions do not end with a period

Example	Time	Cost
1	12.5	\$1,000
2	24	\$2,000

7 Tables

All tables should be numbered consecutively and centered above the table as shown in Table 1. The body of the table should be no smaller than 7 pt. There should be a minimum two line spaces between tables and text.

8 Citing References

The ASME reference format is defined in the authors kit provided by the ASME. The format is:

Text Citation. Within the text, references should be cited in numerical order according to their order of appearance. The numbered reference citation should be enclosed in brackets.

The references must appear in the paper in the order that they were cited. In addition, multiple citations (3 or more in the same brackets) must appear as a “[1-3]”. A complete definition of the ASME reference format can be found in the ASME manual [1].

The bibliography style required by the ASME is unsorted with entries appearing in the order in which the citations appear. If that were the only specification, the standard `BIBTEX` `unsrt` bibliography style could be used. Unfortunately, the bibliography style required by the ASME has additional requirements (last name followed by first name, periodical volume in boldface, periodical number inside parentheses, etc.) that are not part of the `unsrt` style. Therefore, to get ASME bibliography formatting, you must use the `asmems4.bst` bibliography style file with `BIBTEX`. This file is not part of the standard `BibTeX` distribution so you’ll need to place the file someplace where LaTeX can find it (one possibility is in the same location as the file being typeset).

With `LaTeX/BIBTEX`, `LaTeX` uses the citation format set by the class file and writes the citation information into the `.aux` file associated with the `LaTeX` source. `BIBTEX` reads the `.aux` file and matches the citations to the entries in the bibliographic data base file specified in the `LaTeX` source file by the `\bibliography` command. `BIBTEX` then writes the bibliography in accordance with the rules in the `bibliography.bst` style file to a `.bbl` file which `LaTeX` merges with the source text. A good description of the use of `BIBTEX` can be found in [2, 3] (see how two references are handled?). The following is an example of how three or more references [1–3] show up using the `asmems4.bst` bibliography style file in conjunction with the `asme2ej.cls` class file. Here are some more [4–14] which can be used to describe almost any sort of reference.

9 Conclusions

The only way to ensure that your figures are presented in the ASME Journal of Mechanical Design in the way you feel is appropriate and meets the requirement for quality presentation is for you to prepare a double column version of the paper in a form similar to that used by the Journal.

This gives you the opportunity to ensure that the figures are sized appropriately, in particular that the labels are readable and match the size of the text in the journal, and that the line weights and resolutions have no pixilation or rasterization. Poor quality figures are immediately obvious on the printed page, and this detracts from the perceived quality of the journal.

I am pleased to provide advice on how to improve any figure, but this effort must start with a two-column version of the manuscript. Thank you in advance for your patience with this effort, it will ensure quality presentation of your research contributions.

¹Examine the input file, `asme2ej.tex`, to see how a footnote is given in a head.

²Avoid footnotes if at all possible.

References

- [1] ASME, 2003. *ASME Manual MS-4, An ASME Paper*, latest ed. The American Society of Mechanical Engineers, New York. See also URL <http://www.asme.org/pubs/MS4.html>.
- [2] Lamport, L., 1986. *TEX: a Document Preparation System*. Addison-Wesley, Reading, MA.
- [3] Goosens, M., Mittelbach, F., and Samarin, A., 1994. *The TEX Companion*. Addison-Wesley, Reading, MA.
- [4] Author, A., Author, B., and Author, C., 1994. "Article title". *Journal Name*, **1**(5), May, pp. 1–3.
- [5] Booklet, A., 1994. Booklet title. On the WWW, at <http://www.abc.edu>, May. PDF file.
- [6] Inbook, A., ed., 1991. *Book title*, 1st ed., Vol. 2 of *Series Title*. Publisher Name, Publisher address, Chap. 1, pp. 1–3. See also URL <http://www.abc.edu>.
- [7] Incollection, A., 1991. "Article title". In *Collection Title*, A. Editor, ed., 3rd ed., Vol. 2 of *Series title*. Publisher Name, Publisher address, May, Chapter 1, pp. 1–3. See also URL <http://www.abc.edu>.
- [8] Inproceedings, A., 1991. "Article title". In *Proceedings Title*, A. Editor and B. Editor, eds., Vol. **1** of *Series name*, Organization Name, Publisher Name, pp. 1–3. Paper number 1234.
- [9] Mastersthesis, A., 2003. "Thesis Title". MS Thesis, University of Higher Education, Cambridge, MA, May. See also URL <http://www.abc.edu>.
- [10] Misc, A., 2003. Miscellaneous Title. On the WWW, May. URL <http://www.abc.edu>.
- [11] Proceedings, A., ed., 1991. Volume Title, Vol. 1 of *Proceedings Series*, Organization Name, Publisher Name. See also URL <http://www.abc.edu>.
- [12] Phdthesis, A., 2003. "Thesis Title". PhD Thesis, University of Higher Education, Cambridge, MA, May. See also URL <http://www.abc.edu>.
- [13] Techreport, A., 2003. Techreport title. Progress report 1, University of Higher Education, Cambridge, MA, May. See also URL <http://www.abc.edu>.
- [14] Unpublished, A., 2003. Unpublished document title. See also URL <http://www.abc.edu>, May.

Appendix A: Head of First Appendix

Avoid Appendices if possible.

Appendix B: Head of Second Appendix

Subsection head in appendix

The equation counter is not reset in an appendix and the numbers will follow one continual sequence from the beginning of the article to the very end as shown in the following example.

$$a = b + c. \tag{2}$$