Maple Transactions

Maple Transactions LaTeX Template Version 1.0

ANONYMOUS AUTHOR(S)*

Abstract. This template is to show how to use MapleTrans.cls, which is a LaTeX class file derived from acmart.cls. Differences from the acmart.cls will be marked; here we use the color red to do so. One difference is that Maple Transactions would like you to include the word "Abstract" in bold at the beginning of your abstract. A clear and well-documented LaTeX document is presented as an article formatted for publication by ACM in a conference proceedings or journal publication. Based on the "acmart" document class, this article presents and explains many of the common variations, as well as many of the formatting elements an author may use in the preparation of the documentation of their work.

CCS Concepts: • **Computer systems organization** → **Embedded systems**; *Redundancy*; Robotics; • **Networks** → Network reliability.

Additional Key Words and Phrases: datasets, neural networks, gaze detection, text tagging

Recommended Reference Format:
Anonymous Author(s). 2021. Maple Transactions LaTeX Template Version 1.0. *Maple Trans.* X, Y, Article Z (2021), 11 pages. https://doi.org/10.5206/mt.vViI.XXXXX

1 Introduction

The editors of Maple Transactions chose to base the style file for the journal on acmart.cls, for several reasons, including the following:

(1) Many authors for Maple Transactions will already be familiar with acmart.cls, so learning to use this one should be straightforward.
(2) The acmart.cls is well-designed and has several desirable features, including an easy switch "anonymous" for anonymous author/anonymous reviewer refereeing (also called "double-blind" refereeing) which Maple Transactions has adopted.
(3) Permission to modify the acmart.cls is granted as part of the LaTex Public Project license https://www.latex-project.org/lppl/
(4) An important point about those permissions: please do not send bug reports about this template to ACM! Please send them instead to `rcorless@uwo.ca`.

ACM's consolidated article template, introduced in 2017, provides a consistent LaTeX style for use across ACM publications, and incorporates accessibility and metadata-extraction functionality necessary for future Digital Library endeavors. Numerous ACM and SIG-specific LaTeX templates have been examined, and their unique features incorporated into this single new template.
If you are new to publishing with ACM, this document is a valuable guide to the process of preparing your work for publication. If you have published with ACM before, this document provides insight and instruction into more recent changes to the article template.
The "`acmart`" document class can be used to prepare articles for any ACM publication — conference or journal, and for any stage of publication, from review to final "camera-ready" copy, to the author's own version, with *very* few changes to the source.

https://doi.org/10.5206/mt.vViI.XXXXX

2 Template Overview

As noted in the introduction, the "acmart" document class can be used to prepare many different kinds of documentation — a double-blind initial submission of a full-length technical paper, a two-page SIGGRAPH Emerging Technologies abstract, a "camera-ready" journal article, a SIGCHI Extended Abstract, and more — all by selecting the appropriate *template style* and *template parameters*.

This document will explain the major features of the document class. For further information, the *LaTeX User's Guide* is available from https://www.acm.org/publications/proceedings-template.

2.1 Template Styles

The primary parameter given to the "acmart" document class is the *template style* which corresponds to the kind of publication or SIG publishing the work. This parameter is enclosed in square brackets and is a part of the documentclass command:

```
\documentclass[STYLE]{acmart}
```

To use MapleTrans, use either of the following:

```
\documentclass[acmsmall,screen]{MapleTrans}
```

or

```
\documentclass[anonymous,review,acmsmall,screen]{MapleTrans}
```

The anonymous option is helpful for anonymous author/anonymous referee reviewing, which Maple Transactions has adopted. The "review" option puts line numbers everywhere. These may not *quite* line up with every line, but they are quite useful for communicating feedback to authors.

Journals use one of three template styles. All but three ACM journals use the acmsmall template style:

- acmsmall: The default journal template style.
- acmlarge: Used by JOCCH and TAP.
- acmtog: Used by TOG.

The majority of conference proceedings documentation will use the acmconf template style.

- acmconf: The default proceedings template style.
- sigchi: Used for SIGCHI conference articles.
- sigchi-a: Used for SIGCHI "Extended Abstract" articles.
- sigplan: Used for SIGPLAN conference articles.

2.2 Template Parameters

In addition to specifying the *template style* to be used in formatting your work, there are a number of *template parameters* which modify some part of the applied template style. A complete list of these parameters can be found in the *LaTeX User's Guide*.

Frequently-used parameters, or combinations of parameters, include:

- anonymous,review: Suitable for a "double-blind" conference submission. Anonymizes the work and includes line numbers. Use with the \acmSubmissionID command to print the submission's unique ID on each page of the work.
- authorversion: Produces a version of the work suitable for posting by the author.
- screen: Produces colored hyperlinks.

This document uses the following string as the first command in the source file:

```
\documentclass[acmsmall]{acmart}
```

3 An important incompatibility issue

The acmart.cls file on which the Maple Transactions style MapleTrans.cls is based is incompatible with the breqn.sty file, which is a delicate style file with a powerful tool that is desirable for use with computer algebra, namely automatic line breaking for multiline equations. Currently, exporting a Maple document to LaTeX requires breqn.sty and maple.sty which depends on breqn.sty. At this time, this incompatibility has not been fully resolved. Instead of using the `maple.sty` supplied with Maple 2021.1 *or earlier*, one needs to use the `maple.sty` file attached to this template. This will become the `maple.sty` file distributed with Maple 2021.2.
In order that breqn's dmath work with acmart.cls or with MapleTrans.cls, one must be careful and load the packages in the order specified below, and use the specified command from the "lineno" package to adjust the dmath environment so that it won't cause the pdf generator of Overleaf to hang. We hope this situation is temporary. Indeed, the issue (in Overleaf) seems to have been fixed now, and in this template those lines have now been commented out. [Remark: the separation of the `\begin` and the `\end` as shown below (commented out) caused some LaTeX front-ends to complain; for instance, Overleaf's syntax-checker does not like that separation. It is, however, legal LaTeX and does what is intended, namely prevent the pdf generator from hanging, so you may ignore the warning that happens if you uncomment the lines.]

```
\usepackage{etoolbox}
\usepackage{breqn}
\usepackage{lineno}
%\BeforeBeginEnvironment{dmath}{\begin{nolinenumbers}}%
%\AfterEndEnvironment{dmath}{\end{nolinenumbers}}
\usepackage{maple}
```

4 Modifications

The acmart.cls is quite restrictive with respect to modifications: Modifying the template — including but not limited to: adjusting margins, typeface sizes, line spacing, paragraph and list definitions, and the use of the `\vspace` command to manually adjust the vertical spacing between elements of your work — ~~is not allowed~~.
~~**Your** document will be returned to you for revision if modifications are discovered.~~ Maple Transactions, however, is much less restrictive; many modifications are permitted. The editors would like to keep a more-or-less uniform look to the online journal, but if the author feels strongly about something, the editors are likely to be sympathetic.

5 Typefaces

The "`acmart`" document class requires the use of the "Libertine" typeface family. Your TEX installation should include this set of packages. Please do not substitute other typefaces. The "`lmodern`" and "`ltimes`" packages should not be used, as they will override the built-in typeface families. Again, Maple Transactions is less restrictive, and alternative typefaces (within reason) will be permitted.

6 Title Information

The title of your work should use capital letters appropriately - https://capitalizemytitle.com/ has useful rules for capitalization. Use the `title` command to define the title of your work. If your work has a subtitle, define it with the `subtitle` command. Do not insert line breaks in your title. If your title is lengthy, you must define a short version to be used in the page headers, to prevent overlapping text. The `title` command has a "short title" parameter:

```
\title[short title]{full title}
```

7 Authors and Affiliations

Each author must be defined separately for accurate metadata identification. Multiple authors may share one affiliation. Authors' names should not be abbreviated; use full first names wherever possible. Include authors' e-mail addresses whenever possible.
Grouping authors' names or e-mail addresses, or providing an "e-mail alias," as shown below, is not acceptable:

```
\author{Brooke Aster, David Mehldau}
\email{dave,judy,steve@university.edu}
\email{firstname.lastname@phillips.org}
```

The `authornote` and `authornotemark` commands allow a note to apply to multiple authors — for example, if the first two authors of an article contributed equally to the work.
If your author list is lengthy, you must define a shortened version of the list of authors to be used in the page headers, to prevent overlapping text. The following command should be placed just after the last `\author{}` definition:

```
\renewcommand{\shortauthors}{McCartney, et al.}
```

Omitting this command will force the use of a concatenated list of all of the authors' names, which may result in overlapping text in the page headers.
The article template's documentation, available at https://www.acm.org/publications/proceedings-template, has a complete explanation of these commands and tips for their effective use.
Note that authors' addresses are mandatory for journal articles.

8 Rights Information

Authors of any work published by ~~ACM~~Maple Transactions will need to complete a rights form. Depending on the kind of work, and the rights management choice made by the author, this may be copyright transfer, permission, license, or an OA (open access) agreement.
Regardless of the rights management choice, the author will receive a copy of the completed rights form once it has been submitted. This form contains LaTeX commands that must be copied into the source document. When the document source is compiled, these commands and their parameters add formatted text to several areas of the final document:

- the "ACM Reference Format" text on the first page.
- the "rights management" text on the first page.
- ~~the conference information in the page header(s).~~

Rights information is unique to the work; if you are preparing several works for an event, make sure to use the correct set of commands with each of the works.
~~The ACM Reference Format text is required for all articles over one page in length, and is optional for one-page articles (abstracts).~~

9 CCS Concepts and User-Defined Keywords

Two elements of the ~~"acmart"~~MapleTrans document class provide powerful taxonomic tools for you to help readers find your work in an online search.
The ACM Computing Classification System — https://www.acm.org/publications/class-2012 — is a set of classifiers and concepts that describe the computing discipline. Authors can select entries from this classification system, via https://dl.acm.org/ccs/ccs.cfm, and generate the commands to be included in the LaTeX source.

Table 1. Frequency of Special Characters

Non-English or Math	Frequency	Comments
Ø	1 in 1,000	For Swedish names
π	1 in 5	Common in math
\$	4 in 5	Used in business
Ψ_1^2	1 in 40,000	Unexplained usage

User-defined keywords are a comma-separated list of words and phrases of the authors' choosing, providing a more flexible way of describing the research being presented.
CCS concepts and user-defined keywords are required for for all articles over two pages in length, and are optional for one- and two-page articles (or abstracts).

10 Sectioning Commands

Your work should use standard LaTeX sectioning commands: `section`, `subsection`, `subsubsection`, and `paragraph`. They should be numbered; do not remove the numbering from the commands.
Simulating a sectioning command by setting the first word or words of a paragraph in boldface or italicized text is **not allowed.**

Because the hyperref package is included, several very useful commands are immediately available.

(1) href and url for including links to external websites
(2) hypertarget—a utility for linking within the document.

11 Tables

The "`acmart`" document class and the MapleTrans class includes the "`booktabs`" package — https://ctan.org/pkg/booktabs — for preparing high-quality tables.
Table captions are placed *above* the table.
Because tables cannot be split across pages, the best placement for them is typically the top of the page nearest their initial cite. To ensure this proper "floating" placement of tables, use the environment **table** to enclose the table's contents and the table caption. The contents of the table itself must go in the **tabular** environment, to be aligned properly in rows and columns, with the desired horizontal and vertical rules. Again, detailed instructions on **tabular** material are found in the *LaTeX User's Guide*.
Immediately following this sentence is the point at which Table 1 is included in the input file; compare the placement of the table here with the table in the printed output of this document.
To set a wider table, which takes up the whole width of the page's live area, use the environment **table*** to enclose the table's contents and the table caption. As with a single-column table, this wide table will "float" to a location deemed more desirable. Immediately following this sentence is the point at which Table 2 is included in the input file; again, it is instructive to compare the placement of the table here with the table in the printed output of this document.
Always use midrule to separate table header rows from data rows, and use it only for this purpose. This enables assistive technologies to recognise table headers and support their users in navigating tables more easily.

12 Math Equations

You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of the three are discussed in the next sections.

Table 2. Some Typical Commands

Command	A Number	Comments
\author	100	Author
\table	300	For tables
\table*	400	For wider tables

12.1 Inline (In-text) Equations

A formula that appears in the running text is called an inline or in-text formula. It is produced by the **math** environment, which can be invoked with the usual \begin . . . \end construction or with the short form $ . . . $. You can use any of the symbols and structures, from α to ω, available in LaTeX [1]; this section will simply show a few examples of in-text equations in context. Notice how this equation: $\lim_{n\to\infty} x = 0$, set here in in-line math style, looks slightly different when set in display style. (See next section).

12.2 Display Equations

A numbered display equation—one set off by vertical space from the text and centered horizontally—is produced by the **equation** environment. An unnumbered display equation is produced by the **displaymath** environment.

Again, in either environment, you can use any of the symbols and structures available in LaTeX; this section will just give a couple of examples of display equations in context. First, consider the equation, shown as an inline equation above:

$$\lim_{n\to\infty} x = 0 \tag{1}$$

Notice how it is formatted somewhat differently in the **displaymath** environment. Now, we'll enter an unnumbered equation:

$$\sum_{i=0}^{\infty} x + 1$$

and follow it with another numbered equation:

$$\sum_{i=0}^{\infty} x_i = \int_{0}^{\pi+2} f \tag{2}$$

just to demonstrate LaTeX's able handling of numbering.

13 Including Maple or other Code

Long Maple programs should not be included in the text; provide them instead in the supplementary material (ideally, a link to a working Maple workbook with all code and commands). Short bits of code, intended to be read as part of the text, are very welcome.

This can be done in two ways: first by use of the `lstlisting` environment. The following listing (of a meaningless code fragment) is formatted and displayed in Listing 1. In the preamble, put

```
\usepackage{xcolor}
\definecolor{mygreen}{rgb}{0,0.6,0}
\definecolor{mygray}{rgb}{0.5,0.5,0.5}
\definecolor{mymauve}{rgb}{0.58,0,0.82}
\definecolor{altblue}{rgb}{0.0,0.6,1.0}
\definecolor{lstbg}{cmyk}{0.05, 0.01, 0, 0}
```

```
\definecolor{morebluish}{cmyk}{0.06,0.04,0,0}
% Enclose Maple code (short
% passages only) in the lstlisting
% environment with language set
% to "maple", as follows.
% (uses colours defined above)
\usepackage{listings}
\input{listings-maple-definition.sty}
\lstset{
backgroundcolor=\color{lstbg},
 % choose the background color; you must add \usepackage{color} or \usepackage{xcolor}
basicstyle=\small\ttfamily,language=maple
}
```

and then in the text you may include your code by using commands like the following.

```
\begin{lstlisting}[caption={A reasonably efficient implementation
                            of a recurrence relation}
                \label{list:ajrec}]
  a := proc(n, c);
         if not n::posint then
           return 'procname'(args)
         end if;
         return rememberedA(n,c);
       end proc:
\end{lstlisting}
```

Listing 1. A reasonably efficient implementation of a recurrence relation

```
a := proc(n, c);
  if not n::posint then
    return 'procname'(args)
  end if;
  return rememberedA(n,c);
end proc:
```

The `lstlisting` environment can be used similarly for other languages, such as Python or Matlab. See the documentation of the listings package for examples of use for other languages.

The second method to include (short) pieces of Maple in the paper is to use output of Maple's "Export to LaTeX" command in the file. This uses the `maple.sty` file discussed earlier. With that style file, the following input produces the output below it.

```
\mapleinput
{$ \displaystyle \texttt{>\,} \mathit{MGF} \coloneqq (y ,c)\,\rightarrow
\,\mathit{evalf} (y -\mathit{Sum} (\frac{a (j ,c)}{y^{2\cdot j -1}},
j =1..\mathrm{infinity})\,)\, $}

% \mapleresult
\begin{dmath}\label{(1.1.3)}
\mathit{MGF} \coloneqq \left(y ,c \right)\hiderel{\mapsto }\mathit{evalf} \!
\left(y -\left(\moverset{\infty}{\munderset{j =1}{\textcolor{gray}{\sum}}}\!
```

```
\frac{a \! \left(j ,c \right)}{y^{2\cdot j -1}}\right)\right)
\end{dmath}
```

$$> MGF := (y, c) \rightarrow evalf(y - Sum(\frac{a(j,c)}{y^{2\cdot j-1}}, j = 1..\text{infinity}))$$

$$MGF := (y, c) \mapsto evalf\left(y - \left(\sum_{j=1}^{\infty} \frac{a(j,c)}{y^{2\cdot j-1}}\right)\right) \tag{3}$$

14 Figures

The "`figure`" environment should be used for figures. One or more images can be placed within a figure. If your figure contains third-party material, you must clearly identify it as such, as shown in the example below.

Fig. 1. 1907 Franklin Model D roadster. Photograph by Harris & Ewing, Inc. [Public domain], via Wikimedia Commons. (https://goo.gl/VLCRBB).

Your figures should contain a caption which describes the figure to the reader.
Figure captions are placed *below* the figure.

Every figure should also have a figure description unless it is purely decorative. These descriptions convey what's in the image to someone who cannot see it. They are also used by search engine crawlers for indexing images, and when images cannot be loaded.
A figure description must be unformatted plain text less than 2000 characters long (including spaces). **Figure descriptions should not repeat the figure caption – their purpose is to capture important information that is not already provided in the caption or the main text of the paper.** For figures that convey important and complex new information, a short text description may not be adequate. More complex alternative descriptions can be placed in an appendix and referenced in a short figure description. For example, provide a data table capturing the information in a bar chart, or a structured list representing a graph. For additional information regarding how best to write figure descriptions and why doing this is so important, please see https://www.acm.org/publications/taps/describing-figures/.

14.1 The "Teaser Figure"

A "teaser figure" is an image, or set of images in one figure, that are placed after all author and affiliation information, and before the body of the article, spanning the page. If you wish to have such a figure in your article, place the command immediately before the `\maketitle` command:

```
\begin{teaserfigure}
  \includegraphics[width=\textwidth]{sampleteaser}
  \caption{figure caption}
  \Description{figure description}
\end{teaserfigure}
```

15 Citations and Bibliographies

The use of BibTeX for the preparation and formatting of one's references is ~~strongly recommended~~ allowed. Use of biblatex instead (an apparently more modern program) has some advantages, including the "backref" option. We recommend the style=numeric as being sufficiently similar to the ACM Recommended style for our purposes.
To use biblatex with back references (showing which page the work was cited on), which we recommend if you use the standard cite-as-you-go writing style, include the commands

```
\usepackage[backref=true,style=numeric]{biblatex}
\addbibresource{sample-base.bib}
```

in the preamble, and instead of the bibliographystyle and bibliography commands at the end, use

```
\printbibliography[title={Cited works with backrefs}]
```

(with a title that you want—the default is just "References") where you want the bibliography to be. Several styles are available; consult the documentation for biblatex.
Citing online sources, such as the OEIS [2] or Wikipedia [3], is encouraged. The access date should be included in the .bib entry.
Authors' names should be complete — use full first names ("Donald E. Knuth") not initials ("D. E. Knuth") — and the salient identifying features of a reference should be included: title, year, volume, number, pages, article DOI, etc.
The bibliography is included in your source document with these two commands, placed just before the `\end{document}` command:

```
\bibliographystyle{ACM-Reference-Format}
\bibliography{bibfile}
```

where "bibfile" is the name, without the ".bib" suffix, of the BibTeX file. Please use "plain" instead of ACM-Reference-Format for Maple Transactions. There is some incompatibility with some LaTeX installations otherwise. We hope this is temporary.

```
\bibliographystyle{plain}
\bibliography{bibfile}
```

Citations and references are numbered by default. ~~A small number of ACM publications have citations and references formatted in the "author year" style;~~ ... We prefer that you not use "author year" style, but you may if you prefer.
Note: Please consider the practice of confining your citations to a single, final section, perhaps entitled "Notes and References." This section should precede the acknowledgements which should immediately precede the references section generated by the bibliography command. This practice (admittedly unusual in academia) can significantly enhance readability of the main text, while not compromising academic integrity. If you choose to use this method, there will be little need to use backrefs.

16 Supplementary Material

Maple Transactions will publish "live" documents such as Maple Workbooks directly; if any code accompanies the paper, a link on the journal website next to the link to the paper will be provided. In the text of the paper, it is still useful to provide a link to a repository where versions of the code can be found. For instance, you could say something like the following: Code supporting the paper can be found in https://github.com/rcorless/FractalEigenvector.

17 Acknowledgments

Identification of funding sources and other support, and thanks to individuals and groups that assisted in the research and the preparation of the work should be included in an acknowledgment section, which is placed just before the reference section in your document.
This section has a special environment:

```
\begin{acks}
...
\end{acks}
```

so that the information contained therein can be more easily collected during the article metadata extraction phase, and to ensure consistency in the spelling of the section heading.
Authors should not prepare this section as a numbered or unnumbered \section; please use the "acks" environment.

18 Appendices

If your work needs an appendix, add it before the "\end{document}" command at the conclusion of your source document.
Start the appendix with the "appendix" command:

```
\appendix
```

and note that in the appendix, sections are lettered, not numbered. This document has two appendices, demonstrating the section and subsection identification method.

19 SIGCHI Extended Abstracts

The "sigchi-a" template style (available only in LaTeX and not in Word) produces a landscape-orientation formatted article, with a wide left margin. Three environments are available for use with the "sigchi-a" template style, and produce formatted output in the margin:

- `sidebar`: Place formatted text in the margin.
- `marginfigure`: Place a figure in the margin.
- `margintable`: Place a table in the margin.

References

[1] Leslie Lamport. *LaTeX: A Document Preparation System.* Addison-Wesley, Reading, MA., 1986.
[2] OEIS Foundation Inc. The On-Line Encyclopedia of Integer Sequences, 2021. [Online; accessed April-14-2021].
[3] Wikipedia contributors. The butcher group — Wikipedia, the free encyclopedia, 2021. [Online; accessed May-14-2021].

A Research Methods

A.1 Part One

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi malesuada, quam in pulvinar varius, metus nunc fermentum urna, id sollicitudin purus odio sit amet enim. Aliquam ullamcorper eu ipsum vel mollis. Curabitur quis dictum nisl. Phasellus vel semper risus, et lacinia dolor. Integer ultricies commodo sem nec semper.

A.2 Part Two

Etiam commodo feugiat nisl pulvinar pellentesque. Etiam auctor sodales ligula, non varius nibh pulvinar semper. Suspendisse nec lectus non ipsum convallis congue hendrerit vitae sapien. Donec at laoreet eros. Vivamus non purus placerat, scelerisque diam eu, cursus ante. Etiam aliquam tortor auctor efficitur mattis.

B Online Resources

Nam id fermentum dui. Suspendisse sagittis tortor a nulla mollis, in pulvinar ex pretium. Sed interdum orci quis metus euismod, et sagittis enim maximus. Vestibulum gravida massa ut felis suscipit congue. Quisque mattis elit a risus ultrices commodo venenatis eget dui. Etiam sagittis eleifend elementum.