Typesetting Guidelines for the
Theory of Computing

Alexander Russell[*]   John C. Milestone[†]   Kálmán Szőlőssy[‡]

László Szőlőssy[§]   Mária Szőlőssy   Nándor Szőlőssy
Orbán Szőlőssy

Abstract: This document describes LaTeX typesetting guidelines for the *Theory of Computing*, including the use of the `toc.cls` class file.

ACM Classification: None

AMS Classification: None

Key words and phrases: Theory of Computing, Guidelines

1   Introduction

This document describes typesetting guidelines for the *Theory of Computing*. Articles for *Theory of Computing* are to be typeset in LaTeX, using the `toc.cls` class file. The most recent version of the class file (and this explanatory document) may be found at

http://theoryofcomputing.org .

The `toc.cls` class file requires LaTeX2e and the AMS-LaTeX packages `amsmath`, `amssymb` and `amsthm` (all of which are included in the AMS-LaTeX distribution). The AMS-LaTeX distribution is a part of many LaTeX distributions (e.g., TeTeX, MikTeX, &c.) and is freely available from the American Mathematical Society at

<div align="center">

http://www.ams.org/tex/amslatex.html .

</div>

In addition, the `toc.cls` file requires the following packages, all of which are available from the comprehensive TeX archive network (http://www.ctan.org/): `color`, `eucal`, `refcount`, `lastpage` and `hyperref`. Most LaTeX installations will have these package installed by default.

As a general rule, please minimize use fancy LaTeX code or inclusion of esoteric packages.

2   Preamble, title, and author data

Your file should begin with

```
\documentclass{toc}
```

Following this, invoke the commands `\runningauthor` and `\runningtitle` to set the running author and title information for the headers, as below:

```
\runningauthor{First Author, Second Author, Third Author}
\runningtitle{Typesetting Guidelines for ToC}
```

Then use the `\copyrightauthor` command to set the copyright string in the footer of the title page. For example

```
\copyrightuthor{First Author, Second Author, Third Author}
```

Next, invoke the `\begin{document}` command followed by the `frontmatter` declaration, which defines author and title metadata for the article. For example,

```
\begin{document}
\begin{frontmatter}
\title{Typesetting Guidelines for the\\ \textsl{Theory of Computing}}
\tocpdftitle{Typesetting Guidelines for the Theory of Computing}
\tocpdfauthor{First Author, Second Author, et. al.}

\author[first]{First Author\thanks{Supported by GGA Grant \# 142847.}}
\author{Second Author\thanks{Supported by XYZ Grant \# 271828.}}}
\author[third]{Third Author}

\begin{abstract}
  This article provides typesetting guidelines for the
```

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M. Szőlőssy, N. Szőlőssy, O. Szőlőssy

```
    \textsl{Theory of Computing} Journal.
\end{abstract}

\tockeywords{Guidelines, toc.cls, typesetting}
\tocams{Does not fall under AMS Classification}
\tocacm{Does not fall under ACM Classification}

\end{frontmatter}
...
```

Inside the `frontmatter` environment, use the `\tocpdftitle` and `\tocpdfauthor` commands to setup the title and author metadata information for the PDF file. *Note that arguments to these should not use LaTeX constructs*. The title, author(s), abstract, keywords and other metadata associated with your article are assigned as above. One `\author` command should appear for each author. Footnotes on author names may be obtained by the `\thanks` command, as above.

Refrain from using long footnotes inside `\thanks`. Use the `tocauthors` and `tocaboutauthors` environments instead. The optional argument below is used to associate the author's name with the author's institution, email addresses and other information. This additional information is provided using the `tocauthors` and `tocaboutauthors` environments as shown below. These environments should be placed after the bibliography.

```
...
\begin{document}
\begin{frontmatter}
  ...
\end{frontmatter}
% The article comes here
...
\bibliography{example}
\bibliographystyle{tocplain}

\begin{tocauthors}
\begin{tocinfo}[first]
   First Author \tocabout{}\\
   First Institution \\
   myemail\tocat{}mydept\tocdot{}myuniv\tocdot{}edu
\end{tocinfo}
\begin{tocinfo}[third]
   Third Author \\
   Third Institution \\
   anotheremail\tocat{}anotherdept\tocdot{}anotheruniv\tocdot{}edu
\end{tocinfo}
\end{tocauthors}
```

```
\begin{tocaboutauthors}
   \begin{tocabout}[first]
First Author, did his Ph.D. from University of \Pi.
His advisor was \href{http://someplace.somewhere.net}{nobody}.
He is interested in Communication Complexity and Game Theory.
His hobbies include Skiing and Fishing.
   \end{tocabout}
\end{tocaboutauthors}
\end{document}
```

The `\tocabout` macro in the `tocinfo` environment creates a link to the "About the Author" information specified in the `\tocaboutauthors` environment.

3   General typesetting requests

Use the `\section` command to break your exposition into natural sections. For example

```
\section{General typesetting requests}
```

was the command used to typeset the beginning of this section.

Please use \emph rather than \em to *emphasize* text, as \emph is smart about space following the emphasized text. Similarly, use the LaTeX2e commands \texttt, \textsl, \textit, \textsf, and \textbf, to produce `teletype`, *slanted*, *italic*, sans-serif, and **bold** text. In math mode, please use the math mode commands \mathrm and \mathbf commands to produce Roman and **boldface** characters. $\mathcal{CALLIGRAPHIC}$ characters are produced by the \mathcal command (in math mode only). Use \N, \Z, \Q, \R, and \C to produce the symbols for the five common number systems; they will be typeset in blackboard-bold as $\mathbb{N}$, $\mathbb{Z}$, $\mathbb{Q}$, $\mathbb{R}$, $\mathbb{C}$. Use the \mathbb command to create other blackboard-bold characters in math mode; for instance \mathbb{H} will produce $\mathbb{H}$, the standard symbol for the quaternions.

4   Figures and included images

If you wish to include images in your article, please use the \includegraphics command in the graphicx package. Add

```
\usepackage{graphicx}
```

in the preamble, after the \documentclass{toc} command. Usage of `epic` and `eepic` are also encouraged, in general, for generating figures. Included images should always appear within a figure environment:

```
\begin{figure}
  \begin{center}
```

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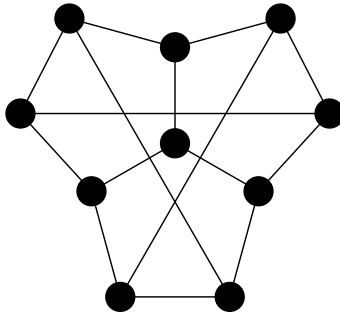M. Szőlőssy, N. Szőlőssy, O. Szőlőssy

Figure 1: Petersen's graph: an included image.

```
    \includegraphics[scale=0.6]{petersen}
  \end{center}
  \caption{Petersen's graph: an included image.}
\end{figure}
```

As *Theory of Computing* publishes articles using Adobe's acrobat format, we ask that you provide versions of your included figures in this format. Figures in encapsulated postscript format can be used to generate acrobat figures by the epstopdf program, also available in the comprehensive TeX archive network at

http://www.ctan.org/tex-archive/support/epstopdf/ .

If you are having BoundingBox issues you may find the epstool program useful. This program can be found at

http://www.cs.wisc.edu/~ghost/gsview/epstool.htm

Remark. The \includegraphics command adapts its behavior depending on whether your LaTeX file is compiled with latex or pdflatex; so long as you do not have an extension on the filename in the \incudegraphics command (as above), it will attempt to load the file with a .pdf extension when called from pdflatex and a .eps extension when called from latex.

5   Mathematical formulæ and proofs

The AMS theorem class is loaded by default, which means that theorems, definitions, etc. are coded as follows:

Theorem 5.1 (Markov's inequality). *Let X be a positive real-valued random variable. Then, for every positive α,*

$$\Pr[X \geq \alpha] \leq \frac{E[X]}{\alpha} \ . \tag{5.1}$$

Constructs for propositions, corollaries, claims, and lemmas are predefined, invoked as above, and share numbering with theorems. For example:

Proposition 5.2 (Chebyshev's inequality). *Let X be a real-valued random variable. Then, for every positive λ,*

$$\Pr\left[|X - E[X]| \geq \lambda\right] \leq \frac{\sigma^2[X]}{\lambda^2} \ .$$

Similar environments for definitions, conjectures, examples, remarks, and facts are also defined. They are typeset slightly differently but do share numbering with the constructs above. For example

Definition 5.3. Let X be a real-valued random variable for which $E[X^2] < \infty$. The *standard deviation* of X, denoted $\sigma[X]$, is given by

$$\sigma[X] = \sqrt{E\left[\left(X - E[X]\right)^2\right]} \ .$$

If you wish to define a new theorem-like environment (`idea`, for example), you must inform LATEX about the environment in the preamble of your document (that is, between the `\documentclass{toc}` command and the `\begin{document}` command). If you wish to define the environment so that it is typeset like a Theorem (text in Italics), use the sequence of commands:

```
\theoremstyle{plain}
\newtheorem{idea}[theorem]{Idea}
```

If you wish to define an environment so that it is typeset like a Definition (text in Roman), use the sequence of commands:

```
\theoremstyle{definition}
\newtheorem{thought}[theorem]{Thought}
```

Proceed to use the construct in the body of your article as follows:

```
\begin{idea}
  Use binary-coded-decimal instead of the long code.
\end{idea}
```

This will produce the output:

Idea 5.4. *Use binary-coded-decimal instead of the long code.*

With the `thought` environment, the code will be this:

```
\begin{thought}
  Use binary-coded-decimal instead of the long code.
\end{thought}
```

This will produce the output:

Thought 5.5. Use binary-coded-decimal instead of the long code.

Proofs simply use the `proof` environment:

Proof of Markov's inequality. To prove inequality (5.1), expand the definition of $E[X]$. □

A. RUSSELL, J. MILESTONE, K. SZŐLŐSSY, L. SZŐLŐSSY,
M. SZŐLŐSSY, N. SZŐLŐSSY, O. SZŐLŐSSY

Equations. Unnumbered equations, like the one appearing in Proposition 5.2 above, are produced by the $$ (or \[and \]) delimiters: for example,

```
$$
\sigma^2[X] = E\Bigl[\bigl(X - E[X]\bigr)\Bigr]\enspace.
$$
```

produces the equation

$$\sigma^2[X] = E\left[\left(X - E[X]\right)^2\right] \ .$$

Please use \enspace, as above, to provide enough space between equations and any following punctuation. Note how the size of delimiters such as | and [can be changed in an equation by use of the modifiers \bigl and \Bigl. To have LaTeX automatically adjust the size of such delimiters, use \left and \right, as in Equation (5.2) below.

Numbered equation are produced using the standard equation environment. For example, the LaTeX code

```
\begin{equation}
  \label{eq:covariance}
  \cov[X,Y] = E\left[\bigl(X - E[X]\bigr)
    \bigl(Y - E[Y]\bigr)\right]\enspace.
\end{equation}
```

produces the equation

$$\mathrm{Cov}[X,Y] = E\left[\left(X - E[X]\right)\left(Y - E[Y]\right)\right] \ . \tag{5.2}$$

Observe that equations numbers have the form $(s.n)$, where s is a section number and n is a subordinate equation number. To refer to an equation from the main text body, use the \eqref command with the label attached to the equation by the \label command. For example, the reference Equation (5.2) is produced by the LaTeX code Equation~\eqref{eq:example}.

6 Labels and References

Labels are attached to theorems and such using the command \label{labelname} and usually referred to by using \ref{labelname}. Though not required by LaTeX it is advisable that the label names, follow a prefix convention that can used to identify the type of label. For example, labels attaches to Theorems should be prefixed by thm:. This makes copy editing the LaTeX file easier.

In order to simplify phrases like Lemma~\ref{lem:labelname}, toc.cls provides a number of \ref-like environments. For example, to refer to the lemma labelled lem:labelname, you can use \lemref{lem:labelname}. This will generate the word Lemma as well as make it easier for the reader to navigate through your document (clicking on Lemma will take the reader to the referred lemma). The predefined list of \ref-variants include[1]:

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[1]See source file for other variants

`lemref`	(Lemma)	`thmref`	(Theorem)
`propref`	(Proposition)	`corref`	(Corrolary)
`secref`	(Section)	`subsecref`	(Subsection)
`exerref`	(Exercise)	`factref`	(Fact)
`defnref`	(Definition)	`egref`	(Example)
`remref`	(Remark)		

7 Bibliography

All the Bibliography entries should be formatted according to toc guidelines. These guidelines are implemented via the BibTeX style file `tocplain.bst`, which can be downloaded from the journal website. Hence authors are encouraged to use BibTeX databases for the bibliographies as opposed to using the `thebibliography` environment directly in the LaTeX source. Authors are also encouraged to use the "url,ps,pdf" fields in the BibTeX entry to indicate an internet URL where the full text of the cited material is available. Preference should be given to URLs without access restrictions. When specifying a URL ensure that it starts with `http://`.

References

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A. Russell, J. Milestone, K. Szőlőssy, L. Szőlőssy,
M. Szőlőssy, N. Szőlőssy, O. Szőlőssy

AUTHORS

Alexander Russell [About the author]
associate professor
University of Connecticut, Storrs, CT
acr@cse.uconn.edu
http://www.engr.uconn.edu/~acr

John C. Milestone [About the author]
lecturer
University of Chicago, Chicago, IL
milestone@cs.uchicago.edu
http://people.cs.uchicago.edu/~milestone

Kálmán Szőlőssy
senior research associate
TOC Hungary Inc., Kecskemét, Hungary
kszolos@ailab.toc.hu
http://www.toc.hu/~kalman

László Szőlőssy
junior research associate[2]
TOC Hungary Inc., Kecskemét, Hungary
lszolos@ailab.toc.hu
http://www.toc.hu/~laci

Mária Szőlőssy
graduate student
University of Connecticut, Storrs, CT
mszolos@cse.uconn.edu
http://www.engr.uconn.edu/~mariads

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[2]At the time of submission, this author was a graduate student at the University of Connecticut, Storrs, CT.

Nándor Szőlőssy
toddler[3]
Storrs South Day Care, Storrs, CT
mszolos@cse.uconn.edu
http://www.toc.hu/~laci

Orbán Szőlőssy
consultant
Orban Consulting
Palo Alto, CA
orban@orban.com
http://orban.com

ABOUT THE AUTHORS

ALEX RUSSELL graduated from M.I.T. in 1996. His advisor was Mike Sipser. His CS interests include distributed computing, quantum computation, interactive proofs, cryptography, information theory, and group theory. He also enjoys cycling, raising his two kids, and editing the Theory of Computing.

JOHN C. MILESTONE has Masters Degree in accounting from Wabash College, Granville, IL and is currently considering graduate study in computer science. He also enjoys watching the Chicago skyline.[4]

No information is available about the SZŐLŐSSYs except that Orbán was born in Buenos Aires and is no relation to his namesakes.

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[3]Infant at the time of submission.
[4]This footnote to test width problems which might happen