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#### Abstract

This package provides a class for type setting publications of the Association for Computing Machinery.

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# 1 Introduction

The Association for Computing Machinery<sup>1</sup> is the world's largest educational and scientific computing society, which delivers resources that advance computing as a science and a profession. It was one of the early adopters of TeX for its typesetting.

It provided several different classes for a number of journals and conference proceedings. Unfortunately during the years since these classes were written, the code was patched many times, and supporting different versions of the classes became difficult.

This package provides the uniform interface for all ACM publications. It is intended to replace all the different classes and packages and provide an up-to-date LATEX package.

This package uses only free TEX packages and fonts included in TEXLive, MikTEX and other popular TEX distributions. It is intended to be published in these distributions itself, which minimizes users' efforts in the installation and support of this package.

I am grateful to Michael D. Adams, Leif Andersen, Lawrence Christopher Angrave, Dirk Beyer, Joachim Breitner, Benjamin Byholm, Nils Anders Danielsson, Michael Ekstrand, Matthew Fluet, Paolo G. Giarrusso, Ben Greenman, Enrico Gregorio, Jamie Davis, Peter Kemp, Luis Leiva, Ben Liblit, Rholais Lii, LianTze Lim, Kai Mindermann, Frank Mittelbach, Serguei Mokhov, Ross Moore, John Owens, Joel Nider, Tobias Pape, Philip Quinn, Mathias Rav, Andreas Reichinger, Matteo Riondato, Craig Rodkin, Bernard Rous, Feras Saad, Kerry A. Seitz, Jr., David Shamma, Gabriel Scherer, Kartik Singhal, Stephen Spencer, Shin Hwei Tan, Daniel Thomas, Zack Weinberg, John Wickerson and many others for their invaluable help.

The development version of the package is available at https://github.com/borisveytsman/acmart.

# 2 User's guide

This class uses many commands and customizaton options, so it might appear intimidating for a casual user. Do not panic! Many of these commands and options can be safely left with their default values or the values recommended by your conference or journal editors. If you have problems or questions, do not hesitate to ask me directly or the community at <a href="https://github.com/borisveytsman/acmart">https://github.com/borisveytsman/acmart</a>, <a href="https://tex.stackexchange.com">https://tex.stackexchange.com</a> or the closest TEX Users Group. The world-wide TEX Users Group is at <a href="https://tug.org/">https://tug.org/</a>; please consider joining us if you use TEX regularly.

#### 2.1 Installation

Most probably, you already have this package installed in your favorite TEX distribution; if not, you may want to upgrade. You may need to upgrade it anyway since this package uses a number of relatively recent packages, especially the ones related to fonts.

The latest released version of this package can be found on CTAN: https://www.ctan.org/pkg/acmart. The development version can be found on GitHub: https://github.com/borisveytsman/acmart. At this address you can file a bug report—or even contribute your own enhancement by making a pull request.

<sup>1</sup>http://www.acm.org/

Please note that the version on Github is a development (or experimental) version: please download it for testing new features. The production version is the one on CTAN and ACM sites.

Most users should not attempt to install this package themselves but should rather rely on their TEX distributions to provide it. If you decide to install the package yourself, follow the standard rules:

- 1. Run latex acmart.ins. This will produce the file acmart.cls
- 2. Put the files acmart.cls and ACM-Reference-Format.bst in places where LATEX can find them (see [1] or the documentation for your TEX system).
- 3. Update the database of file names. Again, see [1] or the documentation for your TeX system for the system-specific details.
- 4. The file acmart.pdf provides the documentation for the package. (This is probably the file you are reading now.)

As an alternative to items 2 and 3 you can just put the files in the working directory where your . tex file is.

This class uses a number of other packages. They are included in all major TEX distributions (TEXLive, MacTEX, MikTEX) of 2015 and later, so you probably have them installed. Just in case here is the list of these packages:

```
    amscls, http://www.ctan.org/pkg/amscls
```

- amsfonts, http://www.ctan.org/pkg/amsfonts
- amsmath, http://www.ctan.org/pkg/amsmath
- binhex, http://www.ctan.org/pkg/binhex
- balance, http://www.ctan.org/pkg/balance
- booktabs, http://www.ctan.org/pkg/booktabs
- caption, http://www.ctan.org/pkg/caption
- comment, http://www.ctan.org/pkg/comment
- cm-super, http://www.ctan.org/pkg/cm-super
- cmap, http://www.ctan.org/pkg/cmap
- draftwatermark, http://www.ctan.org/pkg/draftwatermark
- environ, http://www.ctan.org/pkg/environ
- etoolbox, http://www.ctan.org/pkg/etoolbox
- fancyhdr, http://www.ctan.org/pkg/fancyhdr
- float, http://www.ctan.org/pkg/float

- fontaxes, http://www.ctan.org/pkg/fontaxes
- geometry, http://www.ctan.org/pkg/geometry
- graphics, http://www.ctan.org/pkg/graphics
- hyperref, http://www.ctan.org/pkg/hyperref
- *ifluatex*, http://www.ctan.org/pkg/ifluatex
- ifxetex, http://www.ctan.org/pkg/ifxetex
- inconsolata, http://www.ctan.org/pkg/inconsolata
- *libertine*, http://www.ctan.org/pkg/libertine
- manyfoot, http://www.ctan.org/pkg/manyfoot
- *microtype*, http://www.ctan.org/pkg/microtype
- mmap, http://www.ctan.org/pkg/mmap
- ms, http://www.ctan.org/pkg/ms
- mweights, http://www.ctan.org/pkg/mweights
- *natbib*, http://www.ctan.org/pkg/natbib
- *nccfoots*, http://www.ctan.org/pkg/nccfoots
- newtx, http://www.ctan.org/pkg/newtx
- oberdiek, http://www.ctan.org/pkg/oberdiek
- pdftex-def, http://www.ctan.org/pkg/pdftex-def
- refcount, http://www.ctan.org/pkg/refcount
- setspace, http://www.ctan.org/pkg/setspace
- textcase, http://www.ctan.org/pkg/textcase
- totpages, http://www.ctan.org/pkg/totpages
- trimspaces, http://www.ctan.org/pkg/trimspaces
- upquote, http://www.ctan.org/pkg/upquote
- *url*, http://www.ctan.org/pkg/url
- xcolor, http://www.ctan.org/pkg/xcolor
- xkeyval, http://www.ctan.org/pkg/xkeyval
- xstring, http://www.ctan.org/pkg/xstring

#### 2.2 Invocation and options

To use this class, put in the preamble of your document

```
\documentclass[\langle options \rangle] \{ acmart \}
```

There are several options corresponding to the type of the document and its general appearance. They are described below. Generally speaking, the options have key=value forms, for example,

```
\documentclass[format=acmsmall, screen=true, review=false]{acmart}
```

The option format describes the format of the output. There are several possible values for this option, for example,

```
\documentclass[format=acmtog]{acmart}
```

Actually the words format = can be omitted, e.g.,

```
\documentclass[acmtog, review=false]{acmart}
```

The possible formats are listed in Table 1. Note that formats starting with acm are intended for journals and transactions, while formats starting with sig are intended for proceedings published as books.

Note that sometimes conference proceedings are published as a special issue (or issues) of an ACM journal. In this case, you should use the journal format for a conference paper. Please contact your conference committee if in doubt.

There are several Boolean options that can take true or false values. They are listed in Table 2. The words =true can be omitted when setting a Boolean option, so instead of screen=true one can write just screen, for example,

```
\documentclass[acmsmall, screen, review]{acmart}
```

The option review is useful when combined with the manuscript format option. It provides a version suitable for reviewers and copy editors.

The default for the option screen depends on the publication. At present it is false for all publications *but* PACM, since PACM is now electronic-only. Thus PACM titles (see Table 5) set this option to true. In the future this option may involve additional features suitable for on-screen versions of articles.

The option natbib is used when the corresponding  $BibT_{E}X$  style is based on natbib. In most cases you do not need to set it. See Section 2.11.

The option anonymous is used for anonymous review processes and causes all author information to be obscured.

The option timestamp is used to include a time stamp in the footer of each page. When preparing a document, this can help avoid confusing different revisions. The footer also includes the page range of the document. This helps detect missing pages in hard copies.

Table 1: The possible values for the format option

Value	Meaning
manuscript	A manuscript. This is the default.
acmsmall	Small single-column format. Used for CIE, CSUR, JACM, JDIQ, JEA,
	JERIC, JETC, PACMCGIT, PACMHCI, PACMPL, TAAS, TACCESS,
	TACO, TALG, TALLIP (formerly TALIP), TCPS, TDS, TEAC, TECS,
	TELO, THRI, TIIS, TIOT, TISSEC, TIST, TKDD, TMIS, TOCE, TOCHI,
	TOCL, TOCS, TOCT, TODAES, TODS, TOIS, TOIT, TOMACS, TOMM
	(formerly TOMCCAP), TOMPECS, TOMS, TOPC, TOPLAS, TOPS,
	TOS, TOSEM, TOSN, TQC, TRETS, TSAS, TSC, TSLP and TWEB, in-
_	cluding special issues.
acmlarge	Large single-column format. Used for DTRAP, HEALTH, IMWUT,
	JOCCH, POMACS and TAP, including special issues.
acmtog	Large double-column format. Used for TOG, including annual confer-
	ence Technical Papers.
sigconf	Proceedings format for most ACM conferences (with the exceptions
	listed below) and all ICPS volumes.
sigplan	Proceedings format for SIGPLAN conferences.
sigchi	Proceedings format for SIGCHI conferences.
sigchi-a	Format for SIGCHI extended abstracts.

The option authordraft is intended for author's drafts that are not intended for distribution. It typesets a copyright block to give the author an idea of its size and the overall size of the paper but overprints it with the phrase "Unpublished working draft. Not for distribution.", which is also used as a watermark. This option sets timestamp and review to true, but these can be overriden by setting these options to false *after* setting authordraft to true.

The option balance determines whether the last page in the two column mode has balanced columns. By default it is true; however, it may lead to problems for some documents. Set it to false if you encounter compilation errors. Note that for one page documents \balance command might cause problems.

The option urlbreakonhyphens determines whether URLs can be split between lines after hyphens. By default it is true. Set it to false to disallow these breaks.

#### 2.3 Top matter

A number of commands set up *top matter* or (in computer science jargon) *metadata* for an article. They establish the publication name, article title, authors, DOI and other data. Some of these commands, like \title and \author, should be put by the authors. Others, like \acmVolume and \acmDOI—by the editors. Below we describe these commands and mention who should issue them. These macros should be used *before* the \maketitle command. Note that in previous versions of ACM classes some of these commands should be used before \maketitle, and some after it. Now they all must be

Table 2: Boolean options

Option	Default	Meaning
review	false	A review version: lines are numbered and hyperlinks are colored
screen	see text	A screen version: hyperlinks are colored
natbib	true	Whether to use the natbib package (see Section 2.11)
anonymous	false	Whether to make author(s) anonymous
authorversion	false	Whether to generate a special version for the authors' personal use or posting (see Section 2.3)
nonacm	false	Use the class typesetting options for a non-ACM document, which will not include the conference/journal header and footers or permission statements
timestamp	false	Whether to put a time stamp in the footer of each page
authordraft	false	Whether author's-draft mode is enabled
acmthm	true	Whether to define theorem-like environments, see Section 2.7
balance	true	Whether to balance the last page in two column mode
urlbreakonhyphens	true	Whether to break urls on hyphens

used before \maketitle.

This class internally loads the amsart class, so many top-matter commands are inherited from amsart [2].

\acmJournal

The macro  $\armontomal{\langle shortName \rangle}$  sets the name of the journal or transaction for journals and transactions. The argument is the short name of the publication *in uppercase*, for example,

```
\acmJournal{TOMS}
```

The currently recognized journals are listed in Table 5. Note that conference proceedings published in *book* form do not set this macro.

\acmConference

The macro \acmConference[ $\langle short\ name \rangle$ ]{ $\langle name \rangle$ }{ $\langle date \rangle$ }{ $\langle venue \rangle$ } is used for conference proceedings published in the book form. The arguments are the following:

**short name:** the abbreviated name of the conference (optional).

name: the name of the conference.date: the date(s) of the conference.

**venue:** the place of the conference.

Examples:

```
\acmConference[TD'15]{Technical Data Conference}{November
12--16}{Dallas, TX, USA}
\acmConference{SA'15 Art Papers}{November 02--06, 2015}{Kobe, Japan}
```

\acmBooktitle

By default we assume that conference proceedings are published in the book named *Proceedings of CONFERENCE*, where CONFERENCE is the name of the conference inferred from the command \acmConference above. However, sometimes the book title is different. The command \acmBooktitle can be used to set this title, for example,

```
\acmBooktitle{Companion to the first International Conference on the Art, Science and Engineering of Programming (Programming '17)}
```

An ACM paper should have either \acmJournal or \acmConference command. If it has both (or more) commands, the last one takes precedence. Note that if you have the command \acmConference in a journal format like acmsmall, the class will use conference format for bibstrip and reference citation formatting. In the samples directory there is a file sample-acmsmall-conf. tex with the example of this usage.

\editor

In most cases, conference proceedings are edited. You can use the command  $\ensuremath{\mbox{\mbox{\sc heitor}}}\$  to set the editor of the volume. This command can be repeated, for example,

```
\editor{Jennifer B. Sartor}
\editor{Theo D'Hondt}
\editor{Wolfgang De Meuter}
```

\title The command \title, as in the amsart class, has two arguments: one optional, and one mandatory:

```
\title[\langle ShortTitle \rangle] \{\langle FullTitle \rangle \}
```

The mandatory argument is the full title of the article. The optional argument, if present, defines the shorter version of the title for running heads. If the optional argument is absent, the full title is used instead.

It is expected that this command is inserted by the author of the manuscript.

\subtitle

Besides title, ACM classes allow a subtitle, set with the  $\boldsymbol{\langle subtitle \rangle}$  macro.

The commands for specifying authors are highly structured. The reason is they serve double duty: the authors' information is typeset in the manuscript *and* is used by the metadata extraction tools for indexing and cataloguing. Therefore it is very important to follow the guidelines exactly.

\author \orcid \affiliation \email The basic commands are \author, \orcid (for the researchers registered with OR-CID, http://www.orcid.org/), \affiliation and \email. In the simplest case, you enter them in this order:

```
\author{...}
\orcid{...}
\affiliation{...}
```

Do *not* use the LTEX \and macro or commas, or \\ between the authors! Each author deserves his or her own \author command. An attempt to list several authors or their emails in one command leads to a warning or an error. This is not a bug, but the expected behavior.

Note that some formats do not typeset e-mails or ORCID identifiers. Do not worry: the metadata tools will get them.

Sometimes an author has several affiliations. In this case, the \affiliation command should be repeated:

```
\author{...}
\orcid{...}
\affiliation{...}
\affiliation{...}
```

Similarly you can repeat the \email command.

You may have several authors with the same affiliation, different affiliations, or overlapping affiliations (author  $A_1$  is affiliated with institutions  $I_1$  and  $I_2$ , while author  $A_2$  is affiliated with  $I_2$  only, author  $A_3$  is affiliated with  $I_1$  and  $I_3$ , etc.). The recommended solution is to put the \affiliation commands after each author, possibly repeating them:

```
\author{...}
\orcid{...}
```

```
\affiliation{...}
\affiliation{...}
\email{...}
\orcid{...}
\affiliation{...}
\email{...}
\author{...}
\athorid{...}
\athorid{...}
\athorid{...}
\affiliation{...}
\affiliation{...}
\affiliation{...}
\email{...}
```

In some cases, when several authors share the same affiliation, you can try to save space using the format

```
\author{...}
\email{...}
\author{...}
\email{...}
\affiliation{...}
```

However, this format is not generally recommended.

\additionalaffiliation

In some cases, too many affiliations can take too much space. The command  $\additionalaffiliation{\langle affiliation\rangle}$  creates a footnote after an author's name with the words "Also with  $\{\langle affiliation\rangle\}$ ". You should use this command only as a last resort. An example of usage is:

```
\author{G. Tobin}
\author{Ben Trovato}
\additionalaffiliation{%
  \institution{The Th{\o}rv{\"a}ld Group}
  \streetaddress{1 Th{\o}rv{\"a}ld Circle}
  \city{Hekla}
  \country{Iceland}}
\affiliation{%
  \institution{Institute for Clarity in Documentation}
  \streetaddress{P.O. Box 1212}
  \city{Dublin}
  \state{Ohio}
  \postcode{43017-6221}}
```

Here Trovato and Tobin share their affiliation with the Institute for Clarity in Documentation, but only Ben Trovato is affiliated with The Thørväld Group.

\position
\institution
\department
\streetaddress
\city
\state

\postcode \country

The \affiliation and \additionalaffiliation commands are further structured to interact with the metadata extraction tools. Inside these commands you should use the \position, \institution, \department, \city, \streetaddress, \state, \postcode

and \country macros to indicate the corresponding parts of the affiliation. Note that in some cases (for example, journals) these parts are not printed in the resulting copy, but they *are* necessary since they are used by the XML metadata extraction programs. Do *not* put commas or \\ between the elements of \affiliation. They will be provided automatically.

An example of the author block:

```
\author{A. U. Thor}
\orcid{1234-4564-1234-4565}
\affiliation{%
  \institution{University of New South Wales}
  \department{School of Biomedical Engineering}
  \streetaddress{Samuels Building (F25), Kensington Campus}
  \city{Sidney}
  \state{NSW}
  \postcode{2052}
  \country{Australia}}
\email{author@nsw.au.edu}
\author{A. N. Other}
\affiliation{%
  \institution{University of New South Wales}
  \city{Sidney}
  \state{NSW}
  \country{Australia}}
\author{C. O. Respondent}
\orcid{1234-4565-4564-1234}
\affiliation{%
  \institution{University of Pennsylvania}
  \city{Philadelphia}
  \state{PA}
  \country{USA}}
\affiliation{%
  \institution{University of New South Wales}
  \city{Sidney}
  \state{NSW}
  \country{Australia}}
```

Note that the old ACM conference formats did not allow more than six authors and required some effort from authors to achieve alignment. The new format is much better in this.

Sometimes an author works in several departments within the same insitution. There could be two situations: the departments are independent, or one department is within another. In the first case, just repeat the command \department several times. To handle the second case the command has an optional numerical parameter. The departments with higher numbers are higher in the organizational chart. Compare

```
\affiliation{%
  \department[0]{Department of Lunar Studies} % 0 is the default
  \department[1]{John Doe Institute} % higher than 0
```

```
\institution{University of San Serriffe}
\country{San Serriffe}}
and
\affiliation{%
  \department{Department of Lunar Studies} % Not in the John Doe Institute!
  \department{John Doe Institute}
  \institution{University of San Serriffe}
  \country{San Serriffe}}
```

The command \affiliation formats its output according to American conventions. This might be wrong for some cases. Consider, for example, a German address. In Germany, the postcode is put before the city and is not separated by a comma. We can handle this order using

```
\affiliation{%
  \institution{Fluginstitut}
  \streetaddress{Sonnenallee 17}
  \postcode{123456}
  \city{Helm}
  \country{Germany}}
```

However, the comma after the postcode is unfortunate: the address will be typeset (in some formats) as

```
Fluginstitut
Sonenallee 17
123456, Helm, Germany
```

To overcome this problem, the command \affiliation has an optional parameter obeypunctuation, which can be false (the default) or true. If this parameter is true, \afffiliation obeys the author's command. Thus

```
\affiliation[obeypunctuation=true]{%
  \institution{Fluginstitut}\\
  \streetaddress{Sonnenallee 17}\\
  \postcode{123456}
  \city{Helm},
  \country{Germany}}

will be typeset as
Fluginstitut
Sonenallee 17
123456 Helm, Germany
```

Note that you should *not* use this option for journals.

It is expected that these commands are inserted by the author of the manuscript.

\thanks

Like amsart (and unlike standard LateX), we allow \thanks only *outside* of the commands \title and \author. This command is obsolete and should *not* be used in most cases. Do not list your acknowledgments or grant sponsors here. Put this information in the acks environment (see Section 2.10).

\authorsaddresses

In some formats, addresses are printed as a footnote on the first page. By default MTEX typesets them itself using the information you give it. However, you can override its choice using the command \authorsaddresses{\chicknowledge}, for example,

```
\authorsaddresses{%
Authors' addresses: G.~Zhou, Computer Science Department, College of
William and Mary, 104 Jameson Rd, Williamsburg, PA 23185, US;
V.~B\'eranger, Inria Paris-Rocquencourt, Rocquencourt, France;
A.~Patel, Rajiv Gandhi University, Rono-Hills, Doimukh, Arunachal
Pradesh, India; H.~Chan, Tsinghua University, 30 Shuangqing Rd,
Haidian Qu, Beijing Shi, China; T.~Yan, Eaton Innovation Center,
Prague, Czech Republic; T.~He, C.~Huang, J.~A.~Stankovic University
of Virginia, School of Engineering Charlottesville, VA 22903, USA;
T. F. Abdelzaher, (Current address) NASA Ames Research Center,
Moffett Field, California 94035.}
```

You can *suppress* printing authors' addresses by setting them to an empty string: \authorsaddresses{}. Please note that authors' addresses are mandatory for journal articles.

\titlenote \subtitlenote \authornote While the command \thanks generates a note without a footnote mark, sometimes the authors might need notes more tightly connected to the title, subtitle or author. The commands \titlenote, \subtitlenote and \authornote that follow the corresponding commands (\title, \subtitle and \author) generate such notes. For example,

```
\title{This is a title}
\titlenote{This is a titlenote}
\author{A. U. Thor}
\authornote{This is an authornote}
```

\authornotemark

Please never use a \footnote inside an \author or \title command since this confuses the metadata extraction software. (Actually these commands now produce errors.) Sometimes one may need to have the same footnote connected to several authors.

Sometimes one may need to have the same roothote connected to several authors. The command  $\arrowvert authornotemark[\langle number \rangle]$  adds just the footnote mark, for example,

```
\author{A. U. Thor}
\authornote{Both authors contributed equally to the paper}
...
\author{A. N. Other}
\authornotemark[1]
```

The correct numbering of these marks is the responsibility of the user.

\acmVolume \acmNumber \acmArticle \acmYear \acmMonth The macros \acmVolume, \acmNumber, \acmArticle, \acmYear and \acmMonth are inserted by the editor and set the journal volume, issue, article number, year and month corrspondingly. The arguments of all these commands, including \acmMonth, is numerical. For example,

\acmVolume{9}
\acmNumber{4}
\acmArticle{39}
\acmYear{2010}
\acmMonth{3}

Note that \acmArticle is used not only for journals but also for some conference proceedings.

\acmArticleSeq

The articles in the same issue of a journal have a *sequence number*. It is used to vertically position the black blob on the first page of some formats. By default it is the same as the article number, but the command  $\acmArticleSeq\{\langle n\rangle\}$  can be used to change it:

Setting this number to zero suppresses the blob.

\acmSubmissionID

If your paper got a Submission ID from the Conference Management System, put it here:

```
\acmSubmissionID{123-A56-BU3}
```

\acmPrice

The macro  $\acmPrice{\langle price \rangle}$  sets the price for the article, for example,

```
\acmPrice{25.00}
```

Note that you do not need to put the dollar sign here, just the amount. By default the price is \$15.00, unless the copyright is set to usgov, rightsretained, iw3c2w3, or iw3c2w3g, when it is suppressed. Note that to override the defaults you need to set the price *after* the \setcopyright command. Also, the command \acmPrice{} suppresses the printing of the price.

\acmISBN

Book-like volumes have ISBN numbers attached to them. The macro  $\acmISBN(\langle ISBN \rangle)$  sets it. Normally it is set by the typesetter, for example,

```
\acmISBN{978-1-4503-3916-2}
```

\acmD0I

Setting it to the empty string, as  $\acmISBN{}$ , suppresses printing the ISBN. The macro  $\acmDOI{\langle DOI \rangle}$  sets the DOI of the article, for example,

```
\acmDOI{10.1145/9999997.9999999}
```

It is normally set by the typesetter. Setting it to the empty string, as \acmDOI{}, suppresses the DOI.

\acmBadgeR \acmBadgeL Some conference articles get special distinctions, for example, the artifact evaluation for PPoPP 2016 (see http://ctuning.org/ae/ppopp2016.html). These articles display special badges supplied by the conference organizers. This class provides commands to add these badges: \acmBadgeR[ $\langle url \rangle$ ]{ $\langle graphics \rangle$ } and \acmBadgeL[ $\langle url \rangle$ ]{ $\langle graphics \rangle$ }. The first command puts the badge to the right of the title, and the second one—to the left. The exception is the sigchi-a mode for SIGCHI extended abstracts, which puts the badges on the left margin. The arguments have the following meaning: [ $\langle url \rangle$ ], if provided, sets the link to the badge authority in the screen version, while { $\langle graphics \rangle$ } sets the graphics file with the badge image. The file must be a cropped square, which is scaled to a standard size in the output. For example, if the badge image is ae-logo.pdf, the command is

\acmBadgeR[http://ctuning.org/ae/ppopp2016.html]{ae-logo}

\startPage

The macro  $\startPage{\langle page \rangle}$  sets the first page of the article in a journal or book. It is used by the typesetter.

\terms \keywords The command  $\ensuremath{\mbox{keyword}, \ensuremath{\mbox{keyword}, ...}}\$  sets keywords for the article. They must be separated by commas, for example,

```
\keywords{wireless sensor networks, media access control,
multi-channel, radio interference, time synchronization}
```

CCSXML \ccsdesc

ACM publications are classified according to the ACM Computing Classification Scheme (CCS). CCS codes are used both in the typeset version of the publications *and* in the metadata in various databases. Therefore you need to provide both TEX commands and XML metadata with the paper.

The tool at http://dl.acm.org/ccs.cfm can be used to generate CCS codes. After you select the topics, click on "Generate CCS codes" to get results like the following:

```
\begin{CCSXML}
<ccs2012>
 <concept>
  <concept_id>10010520.10010553.10010562</concept_id>
  <concept_desc>Computer systems organization~Embedded systems</concept_desc>
  <concept_significance>500</concept_significance>
 </concept>
 <concept>
  <concept_id>10010520.10010575.10010755</concept_id>
  <concept_desc>Computer systems organization~Redundancy</concept_desc>
  <concept_significance>300</concept_significance>
 </concept>
 <concept>
  <concept_id>10010520.10010553.10010554</concept_id>
  <concept_desc>Computer systems organization~Robotics</concept_desc>
  <concept_significance>100</concept_significance>
```

```
</concept>
<concept>
<concept>
  <concept_id>10003033.10003083.10003095</concept_id>
  <concept_id>10003033.10003083.10003095</concept_id>
  <concept_desc>Networks Network reliability</concept_desc>
  <concept_significance>100</concept_significance>
  </concept>
</cos2012>
  \end{CCSXML}

\ccsdesc[500]{Computer systems organization Embedded systems}
\ccsdesc[300]{Computer systems organization Redundancy}
\ccsdesc{Computer systems organization Robotics}
\ccsdesc[100]{Networks Network reliability}
```

You just need to copy this code and paste it in your paper anywhere before \maketitle.

CCS Concepts and user-defined keywords are required for all articles over two pages in length, and are optional for one- and two-page articles (or abstracts).

\setcopyright

There are several possibilities for the copyright of the papers published by the ACM: the authors may transfer the rights to the ACM, license them to the ACM, some or all authors might be employees of the US or Canadian governments, etc. Accordingly the command \setcopyright{...} is introduced. Its argument is the copyright status of the paper, for example, \setcopyright{acmcopyright}. The possible values for this command are listed in Table 3. This command must be placed in the preamble, before \begin{document}.

The ACM submission software should generate the right command for you to paste into your file.

\copyrightyear

Each copyright statement must have the year of copyright. By default it is the same as \acmYear, but you can override this using the macro \copyrightyear, e.g.,

```
\acmYear{2016}
\copyrightyear{2015}
```

There is a special case for a personal copy that the authors may be allowed to generate for their use or a posting on a personal site (check the instructions for the specific journal or conference for the details). The document option authorversion=true produces a special form of the copyright statement for this case. Note that you still need the \setcopyright command and (optionally) \copyrightyear command to tell TeX about the copyright owner and year. Also, you should be aware that due to the different sizes of the permssion blocks for the printed version and authors' version, the page breaks might be different between them.

abstract

The environment abstract must *precede* the \maketitle command. Again, this is different from the standard Lagran. Putting abstract after \maketitle will trigger an error

teaserfigure

A special kind of figure is used for many two-column conference proceedings.

Table 3: Parameters for the  $\backslash$ setcopyright command

Parameter	Meaning
none	The copyright and permission information is not typeset.
	(This is the option for some ACM conferences.)
acmcopyright	The authors transfer the copyright to the ACM (the "tradi-
	tional" choice).
acmlicensed	The authors retain the copyright but license the publication
	rights to ACM.
rightsretained	The authors retain the copyright and publication rights to
	themselves or somebody else.
usgov	All the authors are employees of the US government.
usgovmixed	Some authors are employees of the US government.
cagov	All the authors are employees of the Canadian government.
cagovmixed	Some authors are employees of the Canadian government.
licensedusgovmixed	Some authors are employees of the US government, and the
	publication rights are licensed to ACM.
licensedcagov	All the authors are employees of the Canadian government,
	and the publication rights are licensed to ACM.
licensedcagovmixed	Some authors are employees of the Canadian government,
	and the publication rights are licensed to ACM.
othergov	Authors are employees of a government other than the US
	or Canada.
licensedothergov	Authors are employees of a government other than the US
	or Canada, and the publication rights are licensed to ACM.
iw3c2w3	Special statement for conferences organized by IW3C2.
iw3c2w3g	Special statement for conferences organized by IW3C2,
	when some authors are approved Google employees.

Table 4: Settings for the \settopmatter command

Parameter	Values	Meaning
printccs printacmref printfolios authorsperrow	true/false true/false true/false numeric	Whether to print CCS categories Whether to print the ACM bibliographic entry Whether to print page numbers (folios) Number of authors per row for the title page in conference proceedings formats

This figure is placed just after the authors but before the main text. The environment teaserfigure is used for these figures. This environment must be used *before* \maketitle, for example,

```
\begin{teaserfigure}
  \includegraphics[width=\textwidth]{sampleteaser}
  \caption{This is a teaser}
  \label{fig:teaser}
\end{teaserfigure}
```

#### \settopmatter

Some information in the top matter is printed for certain journals or proceedings and suppressed for others. You can override these defaults using the command  $\operatorname{settopmatter}{\langle settings \rangle}$ . The settings and their meanings are listed in Table 4. For example,

\settopmatter{printacmref=false, printccs=true, printfolios=true}

The parameter authorsperrow requires some explanation. In conference proceedings authors' information is typeset in boxes, several boxes per row (see sample-sigconf.pdf, sample-sigplan.pdf, etc.). The number of boxes per row is determined automatically. If you want to override this, you can do it using this parameter, for example,

\settopmatter{authorsperrow=4}

However, in most cases you should *not* do this and should use the default settings. Setting authorsperrow to 0 will revert it to the default settings.

The parameter printacmref specifies whether to print the ACM bibliographic entry (default), or not. Note that this entry is required for all articles over one page in length, and is optional for one-page articles (abstracts).

\received

The command  $\ensuremath{\mbox{\sc command}} \ensuremath{\mbox{\sc command}} \ensuremath{\mbo$ 

```
\received{February 2007}
\received[revised]{March 2009}
\received[accepted]{June 2009}
```

\maketitle

The macro \maketitle must be the last command in the top-matter group. That is it must follow the commands defined in this section.

\shortauthors

After the command \maketitle, the macro \shortauthors stores the names of the authors for the running head. You can redefine it if the list of author's name is too long, e.g.,

```
\maketitle
\renewcommand{\shortauthors}{Zhou et al.}
```

#### 2.4 Algorithms

There are now several good packages for typesetting algorithms [3, 4, 5], and the authors are free to choose their favorite one.

# 2.5 Figures and tables

The new ACM styles use the standard LaTeX interface for figures and tables. There are some important items to be aware of, however.

- 1. The captions for figures must be entered *after* the figure bodies and for tables *before* the table bodies.
- 2. The ACM uses the standard types for figures and tables and adds several new ones. In total there are the following types:
  - **figure, table:** a standard figure or table taking a full text width in one-column formats and one column width in two-column formats.
  - figure\*, table\* in two-column formats, a special figure or table taking a full text width.

**teaserfigure:** a special figure before \maketitle.

- **sidebar, marginfigure, margintable:** in the sigchi-a format, special sidebars, tables and figures in the margin.
- 3. Accordingly, when scaling images, one should use the following sizes:
  - (a) For teaserfigure, figure in one-column mode or figure\* in two-column mode, use \textwidth. In one-column mode, you can also use \columnwidth, which coincides with \textwidth in this case.
  - (b) For figure in two-column mode, use \columnwidth.
  - (c) For marginfigure, use \marginparwidth.
  - (d) For figure\* in SIGCHI extended abstracts, use \fulltextwidth.

It is strongly recommended to use the package booktabs [6] and follow its main principles of typography with respect to tables:

1. Never, ever use vertical rules.

#### 2. Never use double rules.

It is also a good idea not to overuse horizontal rules.

For table *footnotes* you have several options described in the TeX FAQ [1]. The simplest one is to use a \minipage environment:

```
\begin{table}
\caption{Simulation Configuration}
\label{tab:conf}
\begin{minipage}{\columnwidth}
\begin{center}
\begin{tabular}{ll}
 \toprule
 TERRAIN\footnote{This is a table footnote. This is a
   table footnote. This is a table footnote.} &
   (200\,m\times\$200\,m) Square\\
 Node Number & 289\\
 Node Placement & Uniform\\
 Application
                & Many-to-Many/Gossip CBR Streams\\
 Payload Size & 32 bytes\\
 Routing Layer & GF\\
 MAC Layer
                 & CSMA/MMSN\\
 Radio Layer
                 & RADIO-ACCNOISE\\
 Radio Bandwidth & 250Kbps\\
               & 20m--45m\\
 Radio Range
 \bottomrule
\end{tabular}
\end{center}
\bigskip
\footnotesize\emph{Source:} This is a table
sourcenote. This is a table sourcenote. This is a table
sourcenote.
\emph{Note:} This is a table footnote.
\end{minipage}
\end{table}
```

sidebar marginfigure margintable SIGCHI extended abstracts use margin space extensively. This package provides three environments for this with optional captions:

sidebar: textual information in the margin

marginfigure: a figure in the margin margintable: a table in the margin

Tables and figures (including margin tables and margin figures) are by default centered. However, in some cases (for example, when you use several subimages per figure) you may need to override this. A good way to do so is to put the contents into a \minipage of the width \columnwidth.

# 2.6 Descriptions of images

\Description

Some readers of ACM publications might be visually challenged. These readers might use a voice-over software to read aloud the papers. It is important to provide them a description of each image used in the paper.

The command \Description[\(\sigma\) should be placed inside every figure, teaserfigure or marginfigure environment to provide a description of the image(s) used in the figure. Unlike \caption, which is used alongside the image, \Description is intended to be used instead of the image, for example,

```
\begin{figure}
  \centering
  \includegraphics{voltage}
  \Description{A bell-like histogram centered at $0.5$~V with most measurements between $0.2$~V and $0.8$~V}
  \caption{Histogram of the measurements of voltage}
  \label{fig:voltage}
\end{figure}
```

At present the lack of descriptions generates a warning at compilation.

#### 2.7 Theorems

The ACM classes define two theorem styles and several pre-defined theorem environments:

**acmdefinition:** this is the style used for example and definition.

These environments are defined by default. In the unusual circumstance that a user does not wish to have these environments defined, the option acmthm=false in the preamble will suppress them.

#### 2.8 Online-only and offline-only material

printonly
screenonly

Some supplementary material in ACM publications is put online but not in the printed version. The text inside the environment screenonly will be typeset only when the option screen (see Section 2.2) is set to true. Conversely, the text inside the environment printonly is typeset only when this option is set to false. For example,

```
\section{Supplementary materials}
\begin{printonly}
Supplementary materials are available in the online version of this paper.
\end{printonly}
\begin{screenonly}
```

```
(The actual supplementary materials.)
\end{screenonly}
```

We use the comment package for typesetting this code, so \begin and \end should start on a line of their own with no leading or trailing spaces.

#### 2.9 Note about anonymous mode

anonsuppress

When the option anonymous is selected, TEX suppresses author information (including the number of authors) for a blind review. However, sometimes the information identifying the authors may be present in the body of the paper. For example,

```
\begin{anonsuppress}
  This is the continuation of the previous work by the author
  \cite{prev1, prev2}.
\end{anonsuppress}
```

As for the printonly and screenonly environments, \begin{anonsuppress} and \end{anonsuppress} should start on a line of their own with no leading or trailing spaces.

# 2.10 Acknowledgments

The traditional "Acknowledgments" section is conventionally used to thank persons and granting agencies for their help and support. However, there are several important considerations about this section.

First, in anonymous mode this section must be omitted: it gives too much information to reviewers. Second, data about grants is extracted and stored separately by the postprocessing software. ACM classes provide facilities for both these tasks.

acks

The environment acks starts an unnumbered section "Acknowledgments" unless the anonymous mode is chosen. Put all thanks inside this environment.

As for the printonly and screenonly environments, \begin{acks} and \end{acks} should start on a line of their own with no leading or trailing spaces.

\grantsponsor \grantnum All financial support *must* be listed using the commands \grantsponsor and \grantnum. These commands tell the postprocessing software about the granting organization and grant. The format of these commands is the following:

Here  $\{\langle sponsorID\rangle\}$  is the unique ID used to match grants to sponsors,  $\{\langle name\rangle\}$  is the name of the sponsor,  $\{\langle url\rangle\}$  is its URL, and  $\{\langle number\rangle\}$  is the grant number. The  $\{\langle sponsorID\rangle\}$  of the \grantnum command must correspond to the  $\{\langle sponsorID\rangle\}$  of a \grantsponsor command. Some awards have their own web pages, which you can include using the optional argument of the \grantnum command.

At present  $\{\langle sponsorID \rangle\}$  is chosen by the authors and can be an arbitrary key in the same way the label of a \cite is arbitrarily chosen. There might be a change to this policy if the ACM decides to create a global database of sponsoring organizations.

Example:

```
\begin{acks}
The authors would like to thank Dr. Yuhua Li for providing the
matlab code of the \textit{BEPS} method.

The authors would also like to thank the anonymous referees for
their valuable comments and helpful suggestions. This work is
supported by the \grantsponsor{GS501100001809}{National Natural
Science Foundation of
China}{https://doi.org/10.13039/501100001809} under Grant
No.: \grantnum{GS501100001809}{61273304}
and \grantnum[http://www.nnsf.cn/youngscientists]{GS501100001809}{Young
Scientists' Support Program}.
\end{acks}
```

# 2.11 Bibliography

The ACM uses the natbib package for formatting references and the BibTeX style file ACM-Reference-Format.bst for BibTeX processing. You can disable loading of natbib using the option natbib=false in \documentclass. However, it is not recommended, as well as the use of BibTeX styles other than ACM-Reference-Format.bst, and may delay the processing of the manuscript.

\citestyle

If you use natbib, you can select one of two predefined citation styles using the command \citestyle: the author-year format acmauthoryear or the numeric format acmnumeric. For example,

```
\citestyle{acmauthoryear}
```

Note that numeric citations are the default mode for most formats.

\setcitestyle

You can further customize natbib using the \setcitestyle command, for example,

```
\verb|\setcitestyle{numbers,sort&compress}| \\
```

One of the more common versions is

```
\setcitestyle{nosort}
```

It is useful if you do not like the way natbib sorts citation lists.

If you use natbib, then commands like \citep and \citeauthor are automatically supported. The command \shortcite is the same as \cite in numerical mode and cites the year in author-date mode.

Note that before version 1.48 the command \citeyear put the year in parentheses. In version 1.48 and later it produces just the year; the command \citeyearpar can be used to emulate its old behavior.

There are several customized  $BibT_EX$  entry types and fields in the ACM style file ACM-Reference-Format. bst that you may want to be aware of.

The style supports the fields doi and url, for example,

```
doi = "10.1145/1188913.1188915",
url = "http://ccrma.stanford.edu/~jos/bayes/bayes.pdf",
```

The style supports the arXiv-recommended fields eprint and (optionally) primaryclass, for example,

```
eprint = "960935712",
primaryclass = "cs",
```

See the examples at http://arxiv.org/hypertex/bibstyles/.

There are several special entry types. Types online and game are used for Web pages and games, for example,

```
@online{Thornburg01,
  author = "Harry Thornburg",
  year = "2001",
  title = "Introduction to Bayesian Statistics",
  url = "http://ccrma.stanford.edu/~jos/bayes/bayes.html",
  month = mar,
  lastaccessed = "March 2, 2005",
}
```

Entry types artifactsoftware, artifactdataset (with synonyms software and dataset) can be used to cite software artifacts and datasets, for example,

```
@ArtifactSoftware{R,
   title = {R: A Language and Environment for Statistical Computing},
   author = {{R Core Team}},
   organization = {R Foundation for Statistical Computing},
   address = {Vienna, Austria},
   year = {2019},
   url = {https://www.R-project.org/},
@ArtifactDataset{UMassCitations,
 author = {Sam Anzaroot and Andrew McCallum},
 title
          = {{UMass} Citation Field Extraction Dataset},
          = 2013,
 year
 url
    {http://www.iesl.cs.umass.edu/data/data-umasscitationfield},
 lastaccessed = {May 27, 2019}
}
```

For these entry types you can use the lastaccessed field to add the access date for the URL.

There are two ways to enter video or audio sources in the bibliograpy corresponding to two different possibilies. For standalone sources available online, you can use an online entry and set its howpublished field. For example,

```
@online{Obama08,
                "Barack Obama",
 author =
 year =
                "2008",
 title =
                "A more perfect union",
 howpublished = "Video",
                "5".
 day
       =
 url
                "http://video.google.com/videoplay?docid=6528042696351994555",
 month =
                mar,
 lastaccessed = "March 21, 2008",
```

For sources available as attachments to conference proceedings and similar documents, you can use the usual inproceedings entry type and set its howpublished field:

```
@Inproceedings{Novak03,
 author =
                "Dave Novak"
                "Solder man",
 title =
 booktitle =
                "ACM SIGGRAPH 2003 Video Review on Animation theater Program",
 year =
                "2003",
 publisher =
                "ACM Press"
                "New York, NY",
 address =
                "4",
 pages =
                "March 21, 2008",
 month =
                "10.9999/woot07-S422",
 doi =
 howpublished = "Video",
```

Sometimes you need to cite a complete issue of a journal. The periodical entry type is intended for this:

```
@periodical{JCohen96,
 kev =
 editor =
                "Jacques Cohen",
                "Special issue: Digital Libraries",
 title =
                "Communications of the \{ACM\}",
 journal =
                "39",
 volume =
                "11",
 number =
 month =
                nov,
 year =
                "1996".
}
```

If you do not know the year of publication, the style will add "[n. d.]" (for "no date") to the entry.

If you do not know the author (this is often the case for online entries), use the key field to add a key for sorting and citations, for example,

A note about sorting. The current ACM bibliography styles always sort the entries according to authors names and publication year. There is a controversy about sorting names with "von" or "van" part: should Ludwig van Beethoven be sorted under "V" or under "B"? The American practice is to use "van" in sorting, i.e. to file van Beethoven under "V". However, some authorities recommend to sort Dutch persons according to their last names (see e.g. https://www.ifla.org/files/assets/cataloguing/pubs/names-of-persons\_1996.pdf). While I do not want to take a part in this dispute, I would like to point to the old "noopsort" trick by Oren Patashnik. Add to the .bib file the line

```
@PREAMBLE{"\providecommand{\noopsort}[1]{}"}
and then encode the author as
author = {Ludwig {\noopsort{Beethoven}}van Beethoven},
```

This will make the author to be sorted as "Beethoven" rather than "van Beethoven".

#### 2.12 Colors

While printed ACM publications are usually black and white, screen mode allows the use of colors. The ACM classes pre-define several colors according to [7]: ACMBlue, ACMYellow, ACMOrange, ACMRed, ACMLightBlue, ACMGreen, ACMPurple and ACMDarkBlue. You can use them in color assignments.

The ACM provides the following recommendation on color use.

The most accessible approach would be to ensure that your article is still readable when printed in greyscale. The most notable reasons for this are:

- 1. The most common type of inherited Color Vision Deficiency (CVD) is red-green (in which similar-brightness colors that differ only in their amounts of red or green are often confused), and it affects up to 8% of males and 0.5% of females of Northern European descent.
- 2. The most common type of acquired Color Vision Deficiency (CVD) is blue-yellow (including mild cases for many older adults).

- 3. Most printing is in black and white.
- 4. Situational impairments (e.g., bright sunlight shining on a mobile screen) tend to reduce the entire color gamut, reducing color discriminability.

**Note:** It is *not* safe to encode information using only variations in color (i.e., only differences in hue and/or saturation) as there is bound to be someone affected!

To ensure that you are using the most accessible colors, the ACM recommends that you choose sets of colors to help ensure suitable variations in when printed in greyscale by using either of the following tools:

- 1. ColourBrewer: http://colorbrewer2.org/
- 2. ACE: The Accessible Colour Evaluator: http://daprlab.com/ace/ for designing WCAG 2.0 compliant palettes.

# 2.13 Other notable packages and typographic remarks

Several other packages are recommended for specialized tasks.

The package subcaption [8] is recommended for complex figures with several subplots or subfigures that require separate subcaptioning. The packages nomencl [9] and glossaries [10] can be used for the automatic creation of the lists of symbols and concepts used.

By default acmart prevents all widows and orphans (i.e., lonely lines at the beginning or end of the page) and hyphenation at the end of the page. This is done by the rather strict settings

```
\widowpenalty=10000
\clubpenalty=10000
\brokenpenalty=10000
```

However, this may lead to frustrating results when the authors must obey a page limit. Setting these penalties to smaller values may help if you absolutely need to.

Another problem might be the too strict line breaking rules. Again, a strategically placed \sloppy command or putting the problematic paragraph inside sloppypar environment might help—but beware, the results might be, well, sloppy.

Note that the uppercasing in section titles is done using the textcase package [11], so the command \NoCaseChange inside the title may help to prevent extraneous uppercasing.

#### 2.14 Disabled or forbidden commands

The goal of acmart package is to provide a uniform look and feel for ACM publications. Accordingly, a number of commands is forbidden or disabled in acmart.

You may *not* put several authors or several e-mails into a \author or \email command. This may lead to errors or warning.

You cannot change \baselinestretch in your document: this produces an error. You should not abuse the command \vspace: this command may disturb the type-setting of ACM papers.

#### 2.15 A note for wizards: acmart-preload-hook.tex

Sometimes you need to change the behavior of acmart. The usual way to do this is to redefine commands in the preamble. However, these definitions are executed *after* acmart is loaded and certain decisions are made. This presents a number of problems.

For example, one may want to use the titletoc package with acmart. This package should be loaded before hyperref. However, since acmart loads hyperref itself, the line \usepackage{titletoc} in the preamble will lead to grief (see http://tex.stackexchange.com/questions/357265/using-titletoc-with-acm-acmart-style).

Another example is passing options to a package. Suppose you want to use the dvipsnames option of the xcolor package. Normally you cannot do this because acmart loads this package itself without options.

The file acmart-preload-hook.tex can be used to solve these problems. If this file exists, it will be processed before any other package. You can use this file to load packages or pass options to them. For example, if you put in this file

```
\let\LoadClassOrig\LoadClass
\renewcommand\LoadClass[2][]{\LoadClassOrig[#1]{#2}%
\usepackage{titletoc}}
```

then titletoc will be loaded before hyperref. If you put in this file

\PassOptionsToPackage{dvipsnames}{xcolor}

you will pass dvipsnames to xcolor.

**Important note.** This hook makes it too easy to create a manuscript that is not acceptable by the ACM. It is even easier to create a file that cannot be compiled. So please do not use it *unless you know what you are doing*. And if you use it, *do not ask for support*. If you decide to use this hook, you are on your own.

# 2.16 Currently supported publications

Table 5: ACM publications and arguments of the \acmJournal command

Abbreviation	Publication
CIE	ACM Computers in Entertainment
CSUR	ACM Computing Surveys
DGOV	Digital Government: Research and Practice
DTRAP	Digital Threats: Research and Practice
HEALTH	ACM Transactions on Computing for Healthcare
IMWUT	PACM on Interactive, Mobile, Wearable and Ubiquitous Technologies
JACM	Journal of the ACM
JDIQ	ACM Journal of Data and Information Quality
JEA	ACM Journal of Experimental Algorithmics
JERIC	ACM Journal of Educational Resources in Computing

Table 5: ACM publications and arguments of the \acmJournal command (continued)

Abbreviation	Publication
JETC	ACM Journal on Emerging Technologies in Computing Systems
JOCCH	ACM Journal on Computing and Cultural Heritage
PACMCGIT	Proceedings of the ACM on Computer Graphics and Interactive Tech-
	niques
PACMHCI	PACM on Human-Computer Interaction
PACMPL	PACM on Programming Languages
POMACS	PACM on Measurement and Analysis of Computing Systems
TAAS	ACM Transactions on Autonomous and Adaptive Systems
TACCESS	ACM Transactions on Accessible Computing
TACO	ACM Transactions on Architecture and Code Optimization
TALG	ACM Transactions on Algorithms
TALLIP	ACM Transactions on Asian and Low-Resource Language Information
	Processing
TAP	ACM Transactions on Applied Perception
TCPS	ACM Transactions on Cyber-Physical Systems
TDS	ACM Transactions on Data Science
TEAC	ACM Transactions on Economics and Computation
TECS	ACM Transactions on Embedded Computing Systems
TELO	ACM Transactions on Evolutionary Learning
THRI	ACM Transactions on Human-Robot Interaction
TIIS	ACM Transactions on Interactive Intelligent Systems
TIOT	ACM Transactions on Internet of Things
TISSEC	ACM Transactions on Information and System Security
TIST	ACM Transactions on Intelligent Systems and Technology
TKDD	ACM Transactions on Knowledge Discovery from Data
TMIS	ACM Transactions on Management Information Systems
TOCE	ACM Transactions on Computing Education
TOCHI	ACM Transactions on Computer-Human Interaction
TOCL	ACM Transactions on Computational Logic
TOCS	ACM Transactions on Computer Systems
TOCT	ACM Transactions on Computation Theory
TODAES	ACM Transactions on Design Automation of Electronic Systems
TODS	ACM Transactions on Database Systems
TOG	ACM Transactions on Graphics
TOIS	ACM Transactions on Information Systems
TOIT	ACM Transactions on Internet Technology
TOMACS	ACM Transactions on Modeling and Computer Simulation
TOMM	ACM Transactions on Multimedia Computing, Communications and
	Applications
TOMPECS	ACM Transactions on Modeling and Performance Evaluation of Com-
	puting Systems
TOMS	ACM Transactions on Mathematical Software

Table 5: ACM publications and arguments of the \acmJournal command (continued)

Abbreviation	Publication
TOPC	ACM Transactions on Parallel Computing
TOPLAS	ACM Transactions on Programming Languages and Systems
TOPS	ACM Transactions on Privacy and Security
TOS	ACM Transactions on Storage
TOSEM	ACM Transactions on Software Engineering and Methodology
TOSN	ACM Transactions on Sensor Networks
TQC	ACM Transactions on Quantum Computing
TRETS	ACM Transactions on Reconfigurable Technology and Systems
TSAS	ACM Transactions on Spatial Algorithms and Systems
TSC	ACM Transactions on Social Computing
TSLP	ACM Transactions on Speech and Language Processing
TWEB	ACM Transactions on the Web

Besides the publications listed in Table 5, there is a special "publication" type FACMP, a forthcoming ACM publication, reserved for new journals which are not assigned an ISSN yet.

# 3 Implementation

#### 3.1 Identification

We start with a declaration of who we are. Most .dtx files put driver code in a separate .drv driver file. We roll this code into the main file and use the pseudo-guard <gobble> for it.

```
1 (class)\NeedsTeXFormat{LaTeX2e}
2 (*gobble)
3 \ProvidesFile{acmart.dtx}
4 (/gobble)
5 (class)\ProvidesClass{acmart}
6 [2019/12/18 v1.66 Typesetting articles for the Association for Computing Machinery]
  And the driver code:
7 (*gobble)
8 \documentclass{ltxdoc}
9 \usepackage{array,booktabs,amsmath,graphicx,fancyvrb,tabularx, longtable}
10 \usepackage[tt=false, type1=true]{libertine}
11 \usepackage[varqu]{zi4}
12 \usepackage[libertine]{newtxmath}
13 \usepackage[tableposition=top]{caption}
14 \usepackage{hypdoc}
15 \PageIndex
16 \CodelineIndex
17 \RecordChanges
18 \EnableCrossrefs
19 \begin{document}
20 \DocInput{acmart.dtx}
21 \end{document}
22 (/gobble)
23 (*class)
24 \ensuremath{\mbox{def}\ensuremath{\mbox{@classname}\{acmart\}}}
```

#### 3.2 Preload hook

We preload acmart-preload-hook:

#### 3.3 Options

We need xkeyval since some of our options may have values:

```
29 \RequirePackage{xkeyval}
We use xstring to check whether user input is valid
30 \RequirePackage{xstring}
```

```
format The possible formats
                           31 \define@choicekey*+{acmart.cls}{format}[\ACM@format@nr]{%
                           manuscript, acmsmall, acmlarge, acmtog, sigconf, siggraph,
                               sigplan, sigchi, sigchi-a}[manuscript]{}{%
                               \ClassError{\@classname}{The option format must be manuscript,
                                 acmsmall, acmlarge, acmtog, sigconf, siggraph,
                                 sigplan, sigchi or sigchi-a}}
                           37\def\@DeclareACMFormat#1{\DeclareOptionX{#1}{\setkeys{acmart.cls}{format=#1}}}
                           38 \@DeclareACMFormat{manuscript}
                           39 \@DeclareACMFormat{acmsmall}
                           40 \@DeclareACMFormat{acmlarge}
                           41 \@DeclareACMFormat{acmtog}
                           42 \@DeclareACMFormat{sigconf}
                           43 \@DeclareACMFormat{siggraph}
                           44 \@DeclareACMFormat{sigplan}
                           45 \@DeclareACMFormat{sigchi}
                           46 \@DeclareACMFormat{sigchi-a}
                           47 \ExecuteOptionsX{format}
          \if@ACM@screen Whether we use screen mode
                           48 \define@boolkey+{acmart.cls}[@ACM@]{screen}[true]{%
                           49 \if@ACM@screen
                           50
                                 \PackageInfo{\@classname}{Using screen mode}%
                           51 \else
                                 \PackageInfo{\@classname}{Not using screen mode}%
                           53 \fi}{\PackageError{\@classname}{The option screen can be either true or
                                 false}}
                           55 \ExecuteOptionsX{screen=false}
\if@ACM@urlbreakonhyphens
                           \if@ACM@urlbreakonhyphens
                                 \PackageInfo{\@classname}{Using breaking urls on hyphens}%
                           58
                           59
                                 \PackageInfo{\@classname}{Not breaking urls on hyphens}%
                              \fi}{\PackageError{\@classname}{The option urlbreakonhyphens can be either true or
                                 false}}
                           63 \ExecuteOptionsX{urlbreakonhyphens=true}
          \if@ACM@acmthm Whether we define theorem-like environments.
                           64 \define@boolkey+{acmart.cls}[@ACM@]{acmthm}[true]{%
                           65 \if@ACM@acmthm
                                 \PackageInfo{\@classname}{Requiring acmthm}%
                                 \PackageInfo{\@classname}{Suppressing acmthm}%
                           68
                           69 \fi}{\PackageError{\@classname}{The option acmthm can be either true or
                                 false}}
                           71 \ExecuteOptionsX{acmthm=true}
```

```
\if@ACM@review Whether we use review mode
                          72 \define@boolkey+{acmart.cls}[@ACM@]{review}[true]{%
                          73 \if@ACM@review
                                \PackageInfo{\@classname}{Using review mode}%
                          75
                                \AtBeginDocument{\@ACM@printfoliostrue}%
                                \PackageInfo{\@classname}{Not using review mode}%
                          78 \fi}{\PackageError{\@classname}{The option review can be either true or
                                false}}
                          80 \ExecuteOptionsX{review=false}
  \if@ACM@authorversion Whether we use author's-version mode
                          81 \define@boolkey+{acmart.cls}[@ACM@]{authorversion}[true]{%
                          82 \if@ACM@authorversion
                                \PackageInfo{\@classname}{Using authorversion mode}%
                              \else
                          84
                                \PackageInfo{\@classname}{Not using authorversion mode}%
                          %6 \fi}{\PackageError{\@classname}{The option authorversion can be either true or
                          88 \ExecuteOptionsX{authorversion=false}
         \if@ACM@nonacm Special option for non-ACM publications using the ACM typesetting options.
                          89 \define@boolkey+{acmart.cls}[@ACM@]{nonacm}[true]{%
                          90 \if@ACM@nonacm
                                \PackageInfo{\@classname}{Using nonacm mode}%
                                \AtBeginDocument{\@ACM@printacmreffalse}%
                                % in 'nonacm' mode we disable the "ACM Reference Format"
                                % printing by default, but this can be re-enabled by the
                                % user using \settopmatter{printacmref=true}
                                \PackageInfo{\@classname}{Not using nonacm mode}%
                              \fi}{\PackageError{\@classname}{The option nonacm can be either true or
                                false}}
                          100 \ExecuteOptionsX{nonacm=false}
        \if@ACM@balance
                         Whether to balance the last page
                          101 \define@boolkey+{acmart.cls}[@ACM@]{balance}[true]{}{%
                          102 \PackageError{\@classname}{The option balance can be either true or
                                false}}
                          104 \ExecuteOptionsX{balance}
\if@ACM@natbib@override This macro is no longer used.
                         Whether we use natbib mode
         \if@ACM@natbib
                          105 \define@boolkey+{acmart.cls}[@ACM@]{natbib}[true]{%
                          106 \if@ACM@natbib
                                \PackageInfo{\@classname}{Explicitly selecting natbib mode}%
                          107
                          108 \else
                                \PackageInfo{\@classname}{Explicitly deselecting natbib mode}%
```

```
\fi}{\PackageError{\@classname}{The option natbib can be either true or
                      111
                      112 \ExecuteOptionsX{natbib=true}
 \if@ACM@anonymous
                     Whether we use anonymous mode
                     113 \define@boolkey+{acmart.cls}[@ACM@]{anonymous}[true]{%
                      114 \if@ACM@anonymous
                            \PackageInfo{\@classname}{Using anonymous mode}%
                      116
                            \PackageInfo{\@classname}{Not using anonymous mode}%
                      117
                      118 \fi}{\PackageError{\@classname}{The option anonymous can be either true or
                            false}}
                      120 \ExecuteOptionsX{anonymous=false}
 \if@ACM@timestamp
                     Whether we use timestamp mode
                      121 \define@boolkey+{acmart.cls}[@ACM@]{timestamp}[true]{%
                      122 \if@ACM@timestamp
                      123
                            \PackageInfo{\@classname}{Using timestamp mode}%
                      124
                            \PackageInfo{\@classname}{Not using timestamp mode}%
                      125
                      126
                          \fi}{\PackageError{\@classname}{The option timestamp can be either true or
                            false}}
                      128 \ExecuteOptionsX{timestamp=false}
                     Whether we use author-draft mode
\if@ACM@authordraft
                      129 \define@boolkey+{acmart.cls}[@ACM@]{authordraft}[true]{%
                          \if@ACM@authordraft
                            \PackageInfo{\@classname}{Using authordraft mode}%
                      131
                      132
                            \@ACM@timestamptrue
                      133
                            \@ACM@reviewtrue
                             \PackageInfo{\@classname}{Not using authordraft mode}%
                      fi}{\PackageError{\Qclassname}} The option authordraft can be either true or
                      138 \ExecuteOptionsX{authordraft=false}
      \ACM@fontsize The font size to pass to the base class
                      139 \def\ACM@fontsize{}
                      140 \DeclareOptionX{9pt}{\edef\ACM@fontsize{\CurrentOption}}
                      141 \DeclareOptionX{10pt}{\edef\ACM@fontsize{\CurrentOption}}
                      142 \DeclareOptionX{11pt}{\edef\ACM@fontsize{\CurrentOption}}
                      143 \DeclareOptionX{12pt}{\edef\ACM@fontsize{\CurrentOption}}
                      144 \DeclareOptionX{draft}{\PassOptionsToClass{\CurrentOption}{amsart}}
                      145 \DeclareOptionX{*}{\PassOptionsToClass{\CurrentOption}{amsart}}
                      146 \ProcessOptionsX
                      147 \ClassInfo{\@classname}{Using format \ACM@format, number \ACM@format@nr}
```

# 3.4 Setting switches

```
\if@ACM@manuscript Whether we use manuscript mode
                            148 \newif\if@ACM@manuscript
         \if@ACM@journal
                           There are two kinds of publications: journals and books
                            149 \newif\if@ACM@journal
                           Sometimes ACM wants a journal-like publication to have conference information in the
\if@ACM@journal@bibstrip
                           bibstrip and vice versa, so we have an additional switch.
                           150 \newif\if@ACM@journal@bibstrip
                           The formatting of SIGCHI extended abstracts is quite unusual. We have a special switch
     \if@ACM@sigchiamode
                           for them.
                            151 \newif\if@ACM@sigchiamode
                              Setting up switches
                            152 \ifnum\ACM@format@nr=5\relax % siggraph
                            153 \ClassWarning{\@classname}{The format siggraph is now obsolete.
                                  I am switching to sigconf.}
                            \setkeys{acmart.cls}{format=sigconf}
                            156 \fi
                            157 \ifnum\ACM@format@nr=0\relax
                            158 \@ACM@manuscripttrue
                           159 \else
                           160 \@ACM@manuscriptfalse
                           161 \fi
                            162 \@ACM@sigchiamodefalse
                            163 \ifcase\ACM@format@nr
                            164 \relax % manuscript
                           165 \@ACM@journaltrue
                            166 \or % acmsmall
                            167 \@ACM@journaltrue
                            168 \or % acmlarge
                            169 \@ACM@journaltrue
                            170 \or % acmtog
                           171 \@ACM@journaltrue
                           172 \or % sigconf
                           173 \@ACM@journalfalse
                           174 \or % siggraph
                            175 \@ACM@journalfalse
                           176 \or % sigplan
                           177 \@ACM@journalfalse
                           178 \or % sigchi
                           179 \@ACM@journalfalse
                           180∖or % sigchi-a
                            181 \@ACM@journalfalse
```

182 \@ACM@sigchiamodetrue

183 \fi

```
184\if@ACM@journal
185\@ACM@journal@bibstriptrue
186\else
187\@ACM@journal@bibstripfalse
188\fi
```

# 3.5 Loading the base class and package

At this point we either have \ACM@fontsize or use defaults

```
189 \ifx\ACM@fontsize\@empty
190 \ifcase\ACM@format@nr
191
     \relax % manuscript
       \def\ACM@fontsize{9pt}%
     \or % acmsmall
193
       \def\ACM@fontsize{10pt}%
194
     \or % acmlarge
195
       \def\ACM@fontsize{10pt}%
196
197 \or % acmtog
       \def\ACM@fontsize{9pt}%
198
    \or % sigconf
199
       \def\ACM@fontsize{9pt}%
200
201 \or % siggraph
       \def\ACM@fontsize{9pt}%
202
203
      \or % sigplan
       \def\ACM@fontsize{10pt}%
      \or % sigchi
       \def\ACM@fontsize{10pt}%
206
     \or % sigchi-a
207
       \def\ACM@fontsize{10pt}%
208
209 \fi
210 \fi
211 \ClassInfo{\@classname}{Using fontsize \ACM@fontsize}
212 \LoadClass[\ACM@fontsize, reqno]{amsart}
213 \RequirePackage{microtype}
   We need etoolbox for delayed code
214 \RequirePackage{etoolbox}
   Booktabs is now the default
215 \RequirePackage{booktabs}
   We need totpages to calculate the number of pages and refcount to use that num-
216 \RequirePackage{refcount}
217 \RequirePackage{totpages}
   The \collect@body macro in amsmath is defined using \def. We load environ to
access the \long version of this command
218 \RequirePackage{environ}
```

```
We use setspace for double spacing
219 \if@ACM@manuscript
220 \RequirePackage{setspace}
221 \onehalfspacing
222 \fi
We need textcase for better upcasing
223 \RequirePackage{textcase}
```

#### 3.6 Citations

We patch \setcitestyle to allow, for example, \setcitestyle{sort} and \setcitestyle{nosort}. We patch \citestyle to warn about undefined citation styles.

```
224 \if@ACM@natbib
    \RequirePackage{natbib}
225
    \renewcommand{\bibsection}{%
226
       \section*{\refname}%
227
       \phantomsection\addcontentsline{toc}{section}{\refname}%
228
229
    \renewcommand{\bibfont}{\bibliofont}
230
    \renewcommand\setcitestyle[1]{
231
    \@for\@tempa:=#1\do
232
    233
       \renewcommand\NAT@open{(}\renewcommand\NAT@close{)}\fi
234
235
     \def\@tempb{square}\ifx\@tempa\@tempb
       \renewcommand\NAT@open{[}\renewcommand\NAT@close{]}\fi
     \def\@tempb{angle}\ifx\@tempa\@tempb
237
       \renewcommand\NAT@open{$<$}\renewcommand\NAT@close{$>$}\fi
238
     \def\@tempb{curly}\ifx\@tempa\@tempb
239
       240
     \def\@tempb{semicolon}\ifx\@tempa\@tempb
241
       \renewcommand\NAT@sep{;}\fi
242
     \def\@tempb{colon}\ifx\@tempb\
243
       \renewcommand\NAT@sep{;}\fi
244
     \def\@tempb{comma}\ifx\@tempb\
245
       \renewcommand\NAT@sep{,}\fi
246
     \def\@tempb{authoryear}\ifx\@tempa\@tempb
247
       \NAT@numbersfalse\fi
248
249
     \def\@tempb{numbers}\ifx\@tempa\@tempb
250
       \NAT@numberstrue\NAT@superfalse\fi
     \def\@tempb{super}\ifx\@tempa\@tempb
251
       \NAT@numberstrue\NAT@supertrue\fi
252
     \def\@tempb{nobibstyle}\ifx\@tempa\@tempb
253
       \let\bibstyle=\@gobble\fi
254
255
     \def\@tempb{bibstyle}\ifx\@tempb
256
       \let\bibstyle=\@citestyle\fi
257
     \def\@tempb{sort}\ifx\@tempa\@tempb
258
       \def\NAT@sort{\@ne}\fi
     \def\@tempb{nosort}\ifx\@tempa\@tempb
259
```

```
\def\@tempb{compress}\ifx\@tempa\@tempb
                                                                                             261
                                                                                                                        \def\NAT@cmprs{\@ne}\fi
                                                                                             262
                                                                                                                263
                                                                                                                        \def\NAT@cmprs{\z@}\fi
                                                                                             264
                                                                                                                265
                                                                                                                        \def\NAT@sort{\ene}\def\NAT@cmprs{\ene}\fi
                                                                                             266
                                                                                                                \def\@tempb{mcite}\ifx\@tempa\@tempb
                                                                                             267
                                                                                                                        \let\NAT@merge\@ne\fi
                                                                                             268
                                                                                                                \def\@tempb{merge}\ifx\@tempa\@tempb
                                                                                             269
                                                                                                                       \ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ens
                                                                                             270
                                                                                             271
                                                                                                                \def\@tempb{elide}\ifx\@tempa\@tempb
                                                                                             272
                                                                                                                       \ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ens
                                                                                                                \def\@tempb{longnamesfirst}\ifx\@tempa\@tempb
                                                                                             273
                                                                                                                        \NAT@longnamestrue\fi
                                                                                             274
                                                                                                                \def\@tempb{nonamebreak}\ifx\@tempa\@tempb
                                                                                             275
                                                                                                                       276
                                                                                                                \expandafter\NAT@find@eq\@tempa=\relax\@nil
                                                                                             277
                                                                                                                \if\@tempc\relax\else
                                                                                             278
                                                                                             279
                                                                                                                       \expandafter\NAT@rem@eq\@tempc
                                                                                                                       \def\@tempb{open}\ifx\@tempa\@tempb
                                                                                             280
                                                                                                                           \xdef\NAT@open{\@tempc}\fi
                                                                                             281
                                                                                                                       \def\@tempb{close}\ifx\@tempb
                                                                                             282
                                                                                                                           \xdef\NAT@close{\@tempc}\fi
                                                                                             283
                                                                                                                        \def\@tempb{aysep}\ifx\@tempa\@tempb
                                                                                                                           \xdef\NAT@aysep{\@tempc}\fi
                                                                                                                        \def\@tempb{yysep}\ifx\@tempa\@tempb
                                                                                             286
                                                                                                                           \xdef\NAT@yrsep{\@tempc}\fi
                                                                                             287
                                                                                                                        \def\@tempb{notesep}\ifx\@tempa\@tempb
                                                                                             288
                                                                                                                           \xdef\NAT@cmt{\empc}\fi
                                                                                             289
                                                                                                                       \def\@tempb{citesep}\ifx\@tempa\@tempb
                                                                                             290
                                                                                             291
                                                                                                                           \xdef\NAT@sep{\@tempc}\fi
                                                                                             292
                                                                                                                \fi
                                                                                             293
                                                                                                             }%
                                                                                                             \NAT@@setcites
                                                                                             294
                                                                                             295
                                                                                                             \renewcommand\citestyle[1]{%
                                                                                             296
                                                                                                                   \ifcsname bibstyle@#1\endcsname%
                                                                                             297
                                                                                                                    \csname bibstyle@#1\endcsname\let\bibstyle\@gobble%
                                                                                             299
                                                                                             300
                                                                                                                   \@latex@error{Undefined '#1' citestyle}%
                                                                                             301
                                                                                                                   \fi
                                                                                             302
                                                                                                         }%
                                                                                            303 \fi
                                                                                          The default author-year format:
\bibstyle@acmauthoryear
                                                                                            304 \newcommand{\bibstyle@acmauthoryear}{%
                                                                                                          \setcitestyle{%
                                                                                             305
                                                                                             306
                                                                                                                   authoryear,%
                                                                                             307
                                                                                                                   open={[},close={]},citesep={;},%
```

\def\NAT@sort{\z@}\fi

260

```
aysep={},yysep={,},%
                        308
                               notesep={, }}}
                        309
\bibstyle@acmnumeric The default numeric format:
                       310 \newcommand{\bibstyle@acmnumeric}{%
                            \setcitestyle{%
                        311
                               numbers, sort&compress, %
                       312
                               open={[},close={]},citesep={,},%
                               notesep={, }}}
                          The default is numeric:
                        315 \if@ACM@natbib
                        316 \citestyle{acmnumeric}
                       317 \fi
```

\@startsection Before we call hyperref, we redefine \startsection commands to their LATEX defaults since the amsart ones are too AMS-specific. We need to do this early since we want hyperref to have a chance to redefine them again:

```
318 \def\@startsection#1#2#3#4#5#6{%
               \if@noskipsec \leavevmode \fi
320
                 \par
                 \@tempskipa #4\relax
321
                \@afterindenttrue
322
                \ifdim \@tempskipa <\z@
                         \@tempskipa -\@tempskipa \@afterindentfalse
324
 325 \fi
                \if@nobreak
326
                         \everypar{}%
327
328
                         \addpenalty\@secpenalty\addvspace\@tempskipa
329
                \fi
 330
 331
                  \@ifstar
                         {\@ssect{#3}{#4}{#5}{#6}}%
                         {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}}
 333
 334 \def\@sect#1#2#3#4#5#6[#7]#8{%
                 \edge{\colevel{\colevel{\colevel{\colevel}}} % $$ \edge{\colevel{\colevel{\colevel}} } $$ \edge{\colevel{\colevel}} $$ \edge{\colevel{\colevel}} $$ \edge{\colevel{\colevel}} $$ \edge{\colevel{\colevel}} $$ \edge{\colevel} $$ \edge{\colevel
335
                  \ifnum #2>\c@secnumdepth
 336
                         \let\@svsec\@empty
337
 338
                  \else
                         \refstepcounter{#1}%
339
                         \protected@edef\@svsec{\@seccntformat{#1}\relax}%
340
                 \fi
 341
                  \@tempskipa #5\relax
342
                  \left( \cdot \right) = \left( \cdot \right)
 343
                         \begingroup
 344
                                #6{%
                                        \@hangfrom{\hskip #3\relax\@svsec}%
 346
                                               \interlinepenalty \@M #8\@@par}%
 347
                         \endgroup
 348
```

```
\csname #1mark\endcsname{#7}%
349
                   \ifnum #2>\c@secnumdepth \else
350
                               \@tochangmeasure{\csname the#1\endcsname}%
351
                   \fi
352
                   \addcontentsline{toc}{#1}{%}
353
354
                         \ifnum #2>\c@secnumdepth \else
355
                               \protect\numberline{\csname the#1\endcsname}%
                         \fi
356
                         #7}%
357
             \else
358
                   \def\@svsechd{\%}
359
360
                         #6{\hskip #3\relax
                         \@svsec #8}%
361
                         \csname #1mark\endcsname{#7}%
362
                         \ifnum #2>\c@secnumdepth \else
363
                               \@tochangmeasure{\csname the#1\endcsname\space}%
364
365
                         \addcontentsline{toc}{#1}{%}
366
                               \ifnum #2>\c@secnumdepth \else
368
                                     \protect\numberline{\csname the#1\endcsname}%
369
                               #7}}%
370
             \fi
371
             \@xsect{#5}}
372
373 \def\@xsect#1{%
             \@tempskipa #1\relax
             \ifdim \@tempskipa>\z@
375
                   \par \nobreak
376
                   \vskip \@tempskipa
377
                   \@afterheading
378
379
             \else
380
                   \@nobreakfalse
381
                   \global\@noskipsectrue
                   \everypar{%
382
                         \if@noskipsec
383
                               \global\@noskipsecfalse
384
                            {\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc}^{\sc}_{\sc
385
386
                               \clubpenalty\@M
387
                               \begingroup \@svsechd \endgroup
                               \unskip
388
389
                               \@tempskipa #1\relax
                               \hskip -\@tempskipa
390
                         \else
391
                               \clubpenalty \@clubpenalty
392
393
                               \everypar{}%
394
                         \fi}%
395
            \fi
             \ignorespaces}
397 \def\@seccntformat#1{\csname the#1\endcsname\quad}
398 \def\@ssect#1#2#3#4#5{%
```

```
\@tempskipa #3\relax
                   399
                        \ifdim \@tempskipa>\z@
                    400
                          \begingroup
                    401
                            #4{%
                    402
                               \@hangfrom{\hskip #1}%
                    403
                                 \label{lem:linepenalty $$\emptyset #5\@par}%
                    404
                    405
                          \endgroup
                    406
                        \else
                          \def\@svsechd{#4{\hskip #1\relax #5}}%
                    407
                        \fi
                    408
                        \@xsect{#3}}
                    409
  \@startsection
                  The amsart package redefines \startsection. Here we redefine it again to make the
                   table of contents work.
                   410 \def\@starttoc#1#2{\begingroup\makeatletter
                        \setTrue{#1}%
                   411
                        \par\removelastskip\vskip\z@skip
                   412
                        \@startsection{section}\@M\z@{\linespacing\@plus\linespacing}%
                          {.5\linespacing}{\centering\contentsnamefont}{#2}%
                        \@input{\jobname.#1}%
                    415
                        \if@filesw
                   416
                          \@xp\newwrite\csname tf@#1\endcsname
                    417
                          \immediate\@xp\openout\csname tf@#1\endcsname \jobname.#1\relax
                   418
                    419
                        \global\@nobreakfalse \endgroup
                        \addvspace{32\p@\@plus14\p@}%
                   422 }
   \l@subsection
                  Section spacing is more generous than for amsart
                   423 \ensuremath{\mbox{def}\ensuremath{\mbox{0pt}}{1}}\
   \l@subsection The spacing in amsart is too large
                   424 \end{area} \{ 1pc} \{ 3pc} \} 
\l@subsubsection The spacing in amsart is too large
                    425 \def\l@subsubsection{\@tocline{2}{0pt}{1pc}{5pc}{}}
                      We need to define foonote-related stuff before the call to hyperref (Ross Moore)
    \@makefntext We do not use indentation for footnotes
                    426 \def\@makefntext{\noindent\@makefnmark}
  \@footnotetext In sigchi-a mode our footnotes are in the margin!
                   427 \if@ACM@sigchiamode
                   428 \long\def\@footnotetext#1{\marginpar{%
                          \reset@font\small
                    429
                          \interlinepenalty\interfootnotelinepenalty
                    430
                          \protected@edef\@currentlabel{%
                              \csname p@footnote\endcsname\@thefnmark
                    432
```

```
433
                          }%
                          \color@begingroup
                   434
                            \@makefntext{%
                   435
                              \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
                   436
                          \color@endgroup}}%
                   437
                   438 \fi
\@mpfootnotetext
                  We want the footnotes in minipages centered:
                   439 \long\def\@mpfootnotetext#1{%
                       \global\setbox\@mpfootins\vbox{%
                          \unvbox\@mpfootins
                          \reset@font\footnotesize
                   442
                          \hsize\columnwidth
                   443
                          \@parboxrestore
                          \protected@edef\@currentlabel
                               {\csname p@mpfootnote\endcsname\@thefnmark}%
                   446
                   447
                          \color@begingroup\centering
                            \@makefntext{%
                   448
                              \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
                   449
                          \color@endgroup}}
                   450
    \@makefnmark AMS classes use a buggy definition of \makefnmark. We revert to the standard one.
                   451 \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}
                      And now, hyperref
                   452 \let\@footnotemark@nolink\@footnotemark
                   453 \let\@footnotetext@nolink\@footnotetext
                   454 \RequirePackage[bookmarksnumbered,unicode]{hyperref}
                   455 \pdfstringdefDisableCommands{%
                   456 \def\addtocounter#1#2{}%
                   457 \def\unskip{}%
                   458 \def\textbullet{-}%
                       \def\textrightarrow{ -> }%
                        \def\footnotemark{}%
                   460
                   461 }
                   462 \urlstyle{rm}
                   463 \ifcase\ACM@format@nr
                   464 \relax % manuscript
                   465 \or % acmsmall
                   466 \or % acmlarge
                   467 \or % acmtog
                   468 \or % sigconf
                   469 \or % siggraph
                   470 \or % sigplan
                   471 \urlstyle{sf}
                   472 \or % sigchi
                   473 \or % sigchi-a
                   474 \urlstyle{sf}
                   475 \fi
```

```
\if@ACM@urlbreakonhyphens
                     477
                            478
                          \fi
                     479
                          \if@ACM@screen
                     480
                     481
                            \hypersetup{colorlinks,
                     482
                              linkcolor=ACMPurple,
                              citecolor=ACMPurple,
                     483
                              urlcolor=ACMDarkBlue,
                     484
                              filecolor=ACMDarkBlue}
                     485
                            \else
                     486
                            \hypersetup{hidelinks}
                     487
                     488
                          \hypersetup{pdflang={en},
                     489
                            pdfdisplaydoctitle}}
                     490
                        Bibliography mangling.
                     491 \if@ACM@natbib
                         \let\citeN\cite
                          \let\cite\citep
                          \let\citeANP\citeauthor
                          \let\citeNN\citeyearpar
                          \let\citeyearNP\citeyear
                          \let\citeNP\citealt
                     497
                          \DeclareRobustCommand\citeA
                     498
                             {\begingroup\NAT@swafalse
                     499
                               500
                         \providecommand\newblock{}%
                     501
                     502 \else
                          \AtBeginDocument{%
                     504
                            \let\shortcite\cite%
                     505
                            \providecommand\citename[1]{#1}}
                     506 \fi
                     507 \newcommand\shortcite[2][]{%
                         \ifNAT@numbers\cite[#1]{#2}\else\citeyearpar[#1]{#2}\fi}
\bibliographystyle
                    The amsart package redefines \bibliographystyle since it prefers the AMS bibliographystyle since it prefers the AMS bibliographystyle
                    phy style. We turn it back to the LaTeX definition:
                     509 \def\bibliographystyle#1{%
                         \ifx\@begindocumenthook\@undefined\else
                     510
                            \expandafter\AtBeginDocument
                     511
                     512
                     513
                               \immediate\write\@auxout{\string\bibstyle{#1}}%
                     514
                             \fi}}
                     515
                        Graphics and color.
                     516 \RequirePackage{graphicx}
                     517 \RequirePackage[prologue]{xcolor}
```

476 \AtEndPreamble{%

```
We define ACM colors according to [7]:
518 \definecolor[named]{ACMBlue}{cmyk}{1,0.1,0,0.1}
519 \definecolor[named]{ACMYellow}{cmyk}{0,0.16,1,0}
520 \definecolor[named]{ACMOrange}{cmyk}{0,0.42,1,0.01}
521 \definecolor[named]{ACMRed}{cmyk}{0,0.90,0.86,0}
522 \definecolor[named]{ACMLightBlue}{cmyk}{0.49,0.01,0,0}
523 \definecolor[named]{ACMGreen}{cmyk}{0.20,0,1,0.19}
524 \definecolor[named]{ACMPurple}{cmyk}{0.55,1,0,0.15}
525 \definecolor[named]{ACMDarkBlue}{cmyk}{1,0.58,0,0.21}
  Author-draft mode
526 \if@ACM@authordraft
    \RequirePackage{draftwatermark}
    \SetWatermarkFontSize{0.5in}
    \SetWatermarkColor[gray]{.9}
530
    \SetWatermarkText{\parbox{12em}{\centering}
531
        Unpublished working draft.\\
532
        Not for distribution. }}
533 \fi
```

# 3.7 Paper size and paragraphing

We use geometry for dimensions. Note that the present margins do not depend on the font size option—we might need to change this. See https://github.com/borisveytsman/acmart/issues/5#issuecomment-272881329.

```
534 \RequirePackage{geometry}
535 \ifcase\ACM@format@nr
536 \relax % manuscript
     \geometry{letterpaper,head=13pt,
     marginparwidth=6pc, heightrounded}%
539 \or % acmsmall
     \geometry{twoside=true,
540
       includeheadfoot, head=13pt, foot=2pc,
541
       paperwidth=6.75in, paperheight=10in,
542
       top=58pt, bottom=44pt, inner=46pt, outer=46pt,
543
       marginparwidth=2pc, heightrounded
     }%
545
546 \or % acmlarge
     \geometry{twoside=true, head=13pt, foot=2pc,
547
       paperwidth=8.5in, paperheight=11in,
548
       includeheadfoot,
549
550
       top=78pt, bottom=114pt, inner=81pt, outer=81pt,
551
       marginparwidth=4pc, heightrounded
552
       }%
553 \or % acmtog
     \geometry{twoside=true, head=13pt, foot=2pc,
554
       paperwidth=8.5in, paperheight=11in,
555
       includeheadfoot, columnsep=24pt,
556
        top=52pt, bottom=75pt, inner=52pt, outer=52pt,
557
```

```
}%
             559
             560 \or % sigconf
                   \geometry{twoside=true, head=13pt,
             561
                     paperwidth=8.5in, paperheight=11in,
             562
             563
                     includeheadfoot, columnsep=2pc,
             564
                     top=57pt, bottom=73pt, inner=54pt, outer=54pt,
                     marginparwidth=2pc,heightrounded
             565
                     }%
             566
             567\or % siggraph
                   \geometry{twoside=true, head=13pt,
             568
                     paperwidth=8.5in, paperheight=11in,
             570
                     includeheadfoot, columnsep=2pc,
                     top=57pt, bottom=73pt, inner=54pt, outer=54pt,
             571
                     marginparwidth=2pc,heightrounded
             572
                     }%
             573
             574\or % sigplan
                   \geometry{twoside=true, head=13pt,
             575
                     paperwidth=8.5in, paperheight=11in,
             577
                     includeheadfoot=false, columnsep=2pc,
                     top=1in, bottom=1in, inner=0.75in, outer=0.75in,
             578
             579
                     marginparwidth=2pc,heightrounded
                     }%
             580
             581 \or % sigchi
                   \geometry{twoside=true, head=13pt,
             582
             583
                     paperwidth=8.5in, paperheight=11in,
                     includeheadfoot, columnsep=2pc,
             584
                     top=66pt, bottom=73pt, inner=54pt, outer=54pt,
             585
                     marginparwidth=2pc,heightrounded
             586
                     }%
             587
             588 \or % sigchi-a
                   \geometry{twoside=false, head=13pt,
             590
                     paperwidth=11in, paperheight=8.5in,
                     includeheadfoot, marginparsep=72pt,
             591
                     marginparwidth=170pt, columnsep=20pt,
             592
             593
                     top=72pt, bottom=72pt, left=314pt, right=72pt
             594
                     \@mparswitchfalse
             595
             596
                     \reversemarginpar
             597 \fi
\parindent
            Paragraphing
  \parskip
             598 \setlength\parindent{10\p@}
             599 \setlength\parskip{\z@}
             600 \ifcase\ACM@format@nr
             601 \relax % manuscript
             602 \or % acmsmall
             603 \or % acmlarge
             604 \or % acmtog
             605 \setlength\parindent{9\p@}%
```

marginparwidth=2pc, heightrounded

558

```
606 \or % sigconf
607 \or % siggraph
608 \or % sigplan
609 \or % sigchi
610 \or % sigchi-a
611 \fi
```

#### \normalparindent

The amsart package defines the \normalparindent length and initializes it to 12pt (the value of \parindent in amsart). It is later used to set the \listparindent length in the quotation environment and the \parindent length in the \@footnotetext command. We set \normalparindent to the value of \parindent as selected by acmart for consistent paragraph indents.

612 \setlength\normalparindent{\parindent}

Footnotes require some consideration. We have several layers of footnotes: front-matter footnotes, "regular" footnotes and the special insert for the bibstrip. In the old ACM classes, the bibstrip was a \@float. The problem with floats is that they tend to, well, float—and we want the guarantee they stay.

We use manyfoot for layered footnotes instead.

## \copyrightpermissionfootnoterule

This is the footnote rule that separates the bibstrip from the rest of the paper. It is a full width rule.

```
613 \def\copyrightpermissionfootnoterule{\kern-3\p@ 614 \hrule \@width \columnwidth \kern 2.6\p@}
615 \RequirePackage{manyfoot}
616 \SelectFootnoteRule[2]{copyrightpermission}
617 \DeclareNewFootnote{authorsaddresses}
618 \SelectFootnoteRule[2]{copyrightpermission}
619 \DeclareNewFootnote{copyrightpermission}
```

#### \footnoterule Tschichold's rules:

```
620 \def\footnoterule{\kern-3\p@
621 \hrule \@width 4pc \kern 2.6\p@}
```

#### \endminipage

We do not use footnote rules in minipages

```
622 \def\endminipage{%
       \par
       \unskip
624
       \ifvoid\@mpfootins\else
625
         \vskip\skip\@mpfootins
626
         \normalcolor
627
628
         \unvbox\@mpfootins
629
       \fi
       \@minipagefalse
630
     \color@endgroup
631
632
    \expandafter\@iiiparbox\@mpargs{\unvbox\@tempboxa}}
```

\@textbottom Add some stretch according to David Carlisle's advice at http://tex.stackexchange. com/a/62318/5522

```
634 \def\@textbottom{\vskip \z@ \@plus 1pt} 635 \let\@texttop\relax
```

In two-column layouts, force both columns to be the same height by inserting extra internal vertical space to fill out the page.

```
636 \ifcase\ACM@format@nr
637 \relax % manuscript
638 \or % acmsmall
639 \or % acmlarge
_{640}\,\text{\o or}\, % acmtog
641 \flushbottom
642 \or % sigconf
643 \flushbottom
644 \or % siggraph
645 \flushbottom
646 \or % sigplan
647 \flushbottom
648 \or % sigchi
649 \flushbottom
650 \or % sigchi-a
651\fi
```

## 3.8 Fonts

Somehow PDFTeX and XeTeX require different incantations to make a PDF compliant with the current Acrobat bugs. Xpdf is much better.

The code below is by Ross Moore.

```
652 \RequirePackage{iftex}
                   653 \ifPDFTeX
                   654 \input{glyphtounicode}
                   655 \pdfglyphtounicode{f_f}{FB00}
                   656 \pdfglyphtounicode{f_i}{FB03}
                   657 \pdfglyphtounicode{f_f_l}{FB04}
                   658 \pdfglyphtounicode{f_i}{FB01}
                   659 \pdfglyphtounicode{t_t}{0074 0074}
                   660 \pdfglyphtounicode{f_t}{0066 0074}
                   661 \pdfglyphtounicode{T_h}{0054 0068}
                   662 \pdfgentounicode=1
                   663 \fi
                   664 \RequirePackage{cmap}
\if@ACM@newfonts Whether we load the new fonts
                    665 \newif\if@ACM@newfonts
                   666 \@ACM@newfontstrue
                   667 \IfFileExists{libertine.sty}{}{\ClassWarning{\@classname}{You do not
```

have the libertine package installed. Please upgrade your

```
have the zi4 package installed. Please upgrade your
                                 TeX}\@ACM@newfontsfalse}
                          {\it 673 \ \tt IfFileExists\{newtxmath.sty\}\{} {\tt \ ClassWarning\{\ \ do \ not \ \ do \ \ not \ \ \ do \ \ not \ \ \ do \ \ \ } } }
                                 have the newtxmath package installed. Please upgrade your
                          675
                                 TeX}\@ACM@newfontsfalse}
                             We use Libertine throughout.
                          676 \if@ACM@newfonts
                          677 \RequirePackage[T1]{fontenc}
                          678 \ifxetex
                          679 \RequirePackage[tt=false]{libertine}
                          680 \setmonofont{inconsolata}
                          682 \RequirePackage[tt=false, type1=true]{libertine}
                          683 \fi
                          684 \RequirePackage[varqu]{zi4}
                          685 \RequirePackage[libertine]{newtxmath}
                          686\fi
            \liningnums Libertine defines \liningnums, which makes fontspec unhappy. While we do not use
                         fontspec, some users do.
                          687 \let\liningnums\@undefined
                          688 \AtEndPreamble{%
                          689 \DeclareTextFontCommand{\liningnums}{\libertineLF}}
                             The SIGCHI extended abstracts are sans serif:
                          690 \if@ACM@sigchiamode
                          691 \renewcommand{\familydefault}{\sfdefault}
                          692\fi
                         3.9
                              Image descriptions
\if@Description@present A local switch: whether there is a description in the given figure
                          693 \newif\if@Description@present
                          694 \@Description@presenttrue
 \if@undescribed@images
                         A global switch whether some images were not described
                          695 \newif\if@undescribed@images
                          696 \@undescribed@imagesfalse
           \Description The Description macro right now just sets switches
                          697 \newcommand\Description[2][]{\global\@Description@presenttrue\ignorespaces}
                             The global warning
                          698 \AtEndDocument{\if@undescribed@images
                          699 \ClassWarningNoLine{\@classname}{Some images may lack descriptions}\fi}
```

TeX}\@ACM@newfontsfalse}

669

Hooks for figures and tables. We also patch algorithm and algorithm\* in case somebody uses them.

```
700 \AtBeginEnvironment{figure}{\@Description@presentfalse
701 \let\@vspace\@vspace@orig
702 \let\@vspacer\@vspacer@orig}
703 \AtBeginEnvironment{figure*}{\@Description@presentfalse
704 \let\@vspace\@vspace@orig
705 \let\@vspacer\@vspacer@orig}
706 \AtEndEnvironment{figure}{\if@Description@present\else
707 \global\@undescribed@imagestrue
708 \ClassWarning{\@classname}{A possible image without description}\fi}
709 \AtEndEnvironment{figure*}{\if@Description@present\else
710 \global\@undescribed@imagestrue
711 \ClassWarning{\@classname}{A possible image without description}\fi}
712 \AtBeginEnvironment{table}{\let\@vspace\@vspace@orig
713 \let\@vspacer\@vspacer@orig}
714 \AtBeginEnvironment{table*}{\let\@vspace\@vspace@orig
715 \let\@vspacer\@vspacer@orig}
716 \AtBeginEnvironment{algorithm}{\let\@vspace\@vspace@orig
717 \let\@vspacer\@vspacer@orig}
718 \AtBeginEnvironment{algorithm*}{\let\@vspace\@vspace@orig
719 \let\@vspacer\@vspacer@orig}
```

### 3.10 Floats

We use the caption package

```
721 \RequirePackage{caption, float}
722 \captionsetup[table]{position=top}
723 \if@ACM@journal
724 \captionsetup{labelfont={sf, small},
      textfont={sf, small}, margin=\z@}
725
   \captionsetup[figure]{name={Fig.}}
726
727 \else
728 \captionsetup{labelfont={bf},
      textfont={bf}, labelsep=colon, margin=\z@}
729
730 \ifcase\ACM@format@nr
731 \relax % manuscript
732 \or % acmsmall
733 \or % acmlarge
734 \or % acmtog
735
    \or % sigconf
    \or % siggraph
736
      \captionsetup{textfont={it}}
737
    \or % sigplan
738
      \captionsetup{labelfont={bf},
739
         textfont={normalfont}, labelsep=period, margin=\z@}
740
741 \or % sigchi
      \captionsetup[figure]{labelfont={bf, small},
```

```
textfont={bf, small}}
                 743
                        \captionsetup[table]{labelfont={bf, small},
                 744
                          textfont={bf, small}}
                 745
                      \or % sigchi-a
                 746
                        \captionsetup[figure]{labelfont={bf, small},
                 747
                           textfont={bf, small}}
                 748
                 749
                        \captionsetup[table]{labelfont={bf, small},
                           textfont={bf, small}}
                 750
                 751 \fi
                 752 \fi
       sidebar
                The sidebar environment:
                 753 \newfloat{sidebar}{}{sbar}
                 754 \floatname{sidebar}{Sidebar}
                 755 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}
                The processing of the saved text
     \@sidebar
                 756 \long\def\@sidebar#1{\bgroup\let\@vspace\@vspace@orig
                 757 \let\@vspacer\@vspacer@orig\captionsetup{type=sidebar}%
                 758 \marginpar{\small#1}\egroup}
  marginfigure The marginfigure environment:
                 759 \newenvironment{marginfigure}{\Collect@Body\@marginfigure}{}
\@marginfigure The processing of the saved text
                 760 \long\def\@marginfigure#1{\bgroup
                 761 \let\@vspace\@vspace@orig
                 762 \let\@vspacer\@vspacer@orig
                      \captionsetup{type=figure}%
                 763
                      \marginpar{\@Description@presentfalse\centering
                 764
                        \verb|\small#1\if@Description@present\else| \\
                 765
                           \global\@undescribed@imagestrue
                 766
                           \ClassWarning{\@classname}{A possible image without description}
                 767
                          \fi}%
                      \egroup}
                 769
   margintable The margintable environment:
                 \label{thm:collect@Body\emargintable} $$ \collect@Body\emargintable $$ {\bf Sollect@Body\emargintable} $$
 \@margintable The processing of the saved text
                 771 \long\def\@margintable#1{\bgroup\let\@vspace\@vspace@orig
                 772 \let\@vspacer\@vspacer@orig\captionsetup{type=table}%
                 773 \marginpar{\centering\small#1}\egroup}
                    SIGCHI extended abstracts provide an interesting possibility to push into the margin.
                 Here we use figure* and table* for this.
                We define the width of the boxes as
\fulltextwidth
                 774 \newdimen\fulltextwidth
                 775 \fulltextwidth=\dimexpr(\textwidth+\marginparwidth+\marginparsep)
```

```
\@dblfloat We redefine the double-float command. First, we make the size bigger. Second, our
                   default position is going to be tp (to give marginalia a chance)
                    776 \if@ACM@sigchiamode
                    777 \def\@dblfloat{\bgroup\let\@vspace\@vspace@orig
                    778 \let\@vspacer\@vspacer@orig\columnwidth=\fulltextwidth
                    779 \let\@endfloatbox\@endwidefloatbox
                    780 \def\@fpsadddefault{\def\@fps{tp}}%
                    781 \@float}
                    782 \fi
    \end@dblfloat And the end. Just adding a \bgroup.
                    783 \if@ACM@sigchiamode
                    784 \def\end@dblfloat{%
                    785
                           \end@float\egroup}
                    786 \fi
\@endwidefloatbox This is the end of a wide box—we basically move everything to the left
                    787 \def\@endwidefloatbox{%
                    788 \par\vskip\z@skip
                         \@minipagefalse
                    790
                        \outer@nobreak
                    791 \egroup
                    792 \color@endbox
                    793 \global\setbox\@currbox=\vbox{\moveleft
                           \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
                    795 \wd\@currbox=\textwidth
                    796 }
                   3.11 Lists
                    797 \ifcase\ACM@format@nr
                    798 \relax % manuscript
                    799 \or % acmsmall
                    800 \or % acmlarge
                    801 \or % acmtog
                    802 \or % sigconf
                    803 \or % siggraph
                    804 \or % sigplan
                    805 \def\labelenumi{\theenumi.}
                    806 \def \labelenumii{ \theenumii.}
```

807 \def\labelenumiii{\theenumiii.}
808 \def\labelenumiv{\theenumiv.}

809 \or % sigchi 810 \or % sigchi-a

The AMS uses generous margins for lists. Note that amsart defines \leftmargin values for list levels at the beginning of the document, so we must redefine them in the

same manner. Also, note that amsart redefines the enumerate and itemize environments with a \makelabel command that uses \llap, so the \labelwidth value is (effectively) irrelevant; nonetheless, we follow amsart and set \labelwidth to \leftmargin minus \labelsep.

```
812 \newdimen\@ACM@labelwidth
813 \AtBeginDocument{%
     \setlength\labelsep{4pt}
     \setlength{\@ACM@labelwidth}{6.5pt}
815
 816
     %% First-level list: when beginning after the first line of an
 817
 818 %% indented paragraph or ending before an indented paragraph, labels
     %% should not hang to the left of the preceding/following text.
 820 \setlength\leftmargini{\z@}
     \addtolength\leftmargini{\parindent}
 821
     \addtolength\leftmargini{2\labelsep}
 822
     \addtolength\leftmargini{\@ACM@labelwidth}
 823
 824
     %% Second-level and higher lists.
 825
     \setlength\leftmarginii{\z@}
 827
     \addtolength\leftmarginii{0.5\labelsep}
     \addtolength\leftmarginii{\@ACM@labelwidth}
 828
     \setlength\leftmarginiii{\leftmarginii}
 829
     \setlength\leftmarginiv{\leftmarginiii}
     \setlength\leftmarginv{\leftmarginiv}
 832 \setlength\leftmarginvi{\leftmarginv}
 833 \@listi}
 834 \newskip\listisep
 835 \listisep\smallskipamount
 836 \def\@listI{\leftmargin\leftmargini
     \labelwidth\leftmargini \advance\labelwidth-\labelsep
     \listparindent\z@
     \topsep\listisep}
 840 \let\@listi\@listI
 841 \def\@listii{\leftmargin\leftmarginii
 842 \labelwidth\leftmarginii \advance\labelwidth-\labelsep
 843 \topsep\z@skip}
 844 \def\@listiii{\leftmargin\leftmarginiii
 845 \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
 846 \def\@listiv{\leftmargin\leftmarginiv
 847 \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
 848 \def\@listv{\leftmargin\leftmarginv
 849 \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
 850 \def\@listvi{\leftmargin\leftmarginvi
    \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}
We do not use a colon by default like amsart does:
852 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}
```

\description Make the description environment indentation consistent with that of the itemize and enumerate environments.

\descriptionlabel

```
853 \renewenvironment{description}{\list{}{%
       \labelwidth\@ACM@labelwidth
       \let\makelabel\descriptionlabel}%
855
856 }{
     \ensuremath{\mbox{\c e}}
857
858 }
859 \let\enddescription=\endlist % for efficiency
```

#### 3.12 Top-matter data

893

TISSEC,% 894 TIST,%

\if@ACM@maketitle@typeset

The switch to check whether \maketitle is already typeset. It is initally false, and setting top matter when it is true is wrong.

```
860 \newif\if@ACM@maketitle@typeset
861 \@ACM@maketitle@typesetfalse
```

```
We use the xkeyval interface to define journal titles and the relevant information
862 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
    CIE,%
863
864
    CSUR,%
    DGOV,%
865
866
    DTRAP,%
867 HEALTH,%
868 IMWUT,%
    JACM,%
870 JDIQ,%
871 JEA,%
872 JERIC,%
873 JETC,%
874 JOCCH, %
    PACMCGIT,%
875
    PACMHCI,%
876
877
    PACMPL,%
    POMACS,%
878
    TAAS,%
879
    TACCESS,%
880
881
    TACO,%
882
    TALG,%
    TALLIP,%
    TAP,%
    TCPS,%
885
    TDS,%
886
    TEAC,%
887
    TECS,%
888
    TELO,%
889
    THRI,%
    TIIS,%
891
    TIOT,%
892
```

```
TKDD,%
895
    TMIS,%
896
    TOCE,%
897
    TOCHI,%
898
    TOCL,%
899
    TOCS,%
901
    TOCT,%
    TODAES,%
902
    TODS,%
903
    TOG,%
904
    TOIS,%
905
906
    TOIT,%
    TOMACS,%
    TOMM,%
908
    TOMPECS,%
909
    TOMS,%
910
911 TOPC,%
912 TOPS,%
913 TOPLAS,%
914 TOS,%
915 TOSEM, %
    TOSN,%
916
917 TQC,%
918 TRETS,%
919
    TSAS,%
    TSC,%
    TSLP,%
921
    TWEB,%
922
923 FACMP%
924 }{%
925 \ifcase\@journalCode@nr
926 \relax % CIE
    \def\@journalName{ACM Computers in Entertainment}%
    \def\@journalNameShort{ACM Comput. Entertain.}%
    \def\@permissionCodeOne{1544-3574}%
930 \or % CSUR
    \def\@journalName{ACM Computing Surveys}%
    \def\@journalNameShort{ACM Comput. Surv.}%
    \def\@permissionCodeOne{0360-0300}%
934 \or % DGOV
    \def\@journalName{Digital Government: Research and Practice}%
    \def\@journalNameShort{Digit. Gov. Res. Pract.}%
    \def\@permissionCodeOne{2639-0175}%
938 \or % DTRAP
    \def\@journalName{Digital Threats: Research and Practice}%
    \def\@journalNameShort{Digit. Threat. Res. Pract.}%
^{941} \ \def\encodeOne{2576-5337}%
942 \or % HEALTH
    \def\@journalName{ACM Transactions on Computing for Healthcare}%
```

\def\@journalNameShort{ACM Trans. Comput. Healthcare}%

```
945 \def\@permissionCodeOne{2637-8051}%
946 \or % IMWUT
947 \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
      Wearable and Ubiquitous Technologies}%
948
949 \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
950 \def\@permissionCodeOne{2474-9567}%
951 \@ACM@screentrue
952 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
953 \or % JACM
954 \def\@journalName{Journal of the ACM}%
955 \def\@journalNameShort{J. ACM}%
    \def\@permissionCodeOne{0004-5411}%
957 \or % JDIQ
958 \def\@journalName{ACM Journal of Data and Information Quality}%
    \def\@journalNameShort{ACM J. Data Inform. Quality}%
960 \def\@permissionCodeOne{1936-1955}%
961 \or % JEA
962 \def\@journalName{ACM Journal of Experimental Algorithmics}%
963 \def\@journalNameShort{ACM J. Exp. Algor.}%
964 \def\@permissionCodeOne{1084-6654}%
965 \or % JERIC
966 \def\@journalName{ACM Journal of Educational Resources in Computing}%
967 \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
968 \def\@permissionCodeOne{1073-0516}%
969 \or % JETC
970 \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
   \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
972 \def\@permissionCodeOne{1550-4832}%
973 \or % JOCCH
974 \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
975 \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%
976 \or % PACMCGIT
977 \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
978 \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
   \def\@permissionCodeOne{2577-6193}%
979
980 \@ACM@screentrue
   \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
982 \or % PACMHCI
983 \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
    \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
    \def\@permissionCodeOne{2573-0142}%
    \@ACM@screentrue
987 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
988 \or % PACMPL
989 \def\@journalName{Proceedings of the ACM on Programming Languages}%
990 \def\@journalNameShort{Proc. ACM Program. Lang.}%
991 \def\@permissionCodeOne{2475-1421}%
992 \@ACM@screentrue
993 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
```

994 \or % POMACS

```
995 \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
     \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
     \def\@permissionCodeOne{2476-1249}%
997
    \@ACM@screentrue
998
     \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1000 \or % TAAS
     \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
     \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
     \def\@permissionCodeOne{1556-4665}%
1003
1004 \or % TACCESS
     \def\@journalName{ACM Transactions on Accessible Computing}%
     \def\@journalNameShort{ACM Trans. Access. Comput.}%
     \def\@permissionCodeOne{1936-7228}%
1008 \or % TACO
    \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
1010 \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%
1011 \or % TALG
1012 \def\@journalName{ACM Transactions on Algorithms}%
1013 \def\@journalNameShort{ACM Trans. Algor.}%
1014 \def\@permissionCodeOne{1549-6325}%
1015 \or % TALLIP
1016 \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
    \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
1017
    \def\@permissionCodeOne{2375-4699}%
1018
1019 \or % TAP
1020 \def\@journalName{ACM Transactions on Applied Perception}%
1021 \or % TCPS
    \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
1023 \or % TDS
     \def\@journalName{ACM Transactions on Data Science}%
     \def\@journalNameShort{ACM Trans. Data Sci.}%
1025
    \def\@permissionCodeOne{2577-3224}%
1027 \or % TEAC
1028 \def\@journalName{ACM Transactions on Economics and Computation}%
1029 \or % TECS
     \def\@journalName{ACM Transactions on Embedded Computing Systems}%
1030
     \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
1031
     \def\@permissionCodeOne{1539-9087}%
1033 \or % TELO
     \def\@journalName{ACM Transactions on Evolutionary Learning}%
1034
     \def\@journalNameShort{ACM Trans. Evol. Learn.}%
     \def\@permissionCodeOne{2688-3007}%
1036
1037 \or % THRI
    \def\@journalName{ACM Transactions on Human-Robot Interaction}%
1038
     \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%
    \def\@permissionCodeOne{2573-9522}%
1041 \or % TIIS
1042
     \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
     \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
1043
```

\def\@permissionCodeOne{2160-6455}%

```
1045 \or % TIOT
     \def\@journalName{ACM Transactions on Internet of Things}%
1046
     \def\@journalNameShort{ACM Trans. Internet Things}%
     \def\@permissionCodeOne{2577-6207}%
1048
1049 \or % TISSEC
    \def\@journalName{ACM Transactions on Information and System Security}%
     \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
    \def\@permissionCodeOne{1094-9224}%
1052
1053 \or % TIST
    \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
1054
     \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
     \def\@permissionCodeOne{2157-6904}%
1057 \or % TKDD
     \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
     \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
     \def\@permissionCodeOne{1556-4681}%
1060
1061 \or % TMIS
1062 \def\@journalName{ACM Transactions on Management Information Systems}%
    \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
1064 \def\@permissionCodeOne{2158-656X}%
1065 \or % TOCE
     \def\@journalName{ACM Transactions on Computing Education}%
1066
     \def\@journalNameShort{ACM Trans. Comput. Educ.}%
1067
    \def\@permissionCodeOne{1946-6226}%
1068
1069 \or % TOCHI
    \def\@journalName{ACM Transactions on Computer-Human Interaction}%
     \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
     \def\@permissionCodeOne{1073-0516}%
1072
1073 \or % TOCL
    \def\@journalName{ACM Transactions on Computational Logic}%
     \def\@journalNameShort{ACM Trans. Comput. Logic}%
1075
    \def\@permissionCodeOne{1529-3785}%
1077 \or % TOCS
     \def\@journalName{ACM Transactions on Computer Systems}%
     \def\@journalNameShort{ACM Trans. Comput. Syst.}%
1079
     \def\@permissionCodeOne{0734-2071}%
1080
1081 \or % TOCT
     \def\@journalName{ACM Transactions on Computation Theory}%
     \def\@journalNameShort{ACM Trans. Comput. Theory}%
     \def\@permissionCodeOne{1942-3454}%
1085 \or % TODAES
1086 \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
     \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
    \def\@permissionCodeOne{1084-4309}%
1088
1089 \or % TODS
1090 \def\@journalName{ACM Transactions on Database Systems}%
    \def\@journalNameShort{ACM Trans. Datab. Syst.}%
1092 \def\@permissionCodeOne{0362-5915}%
1093 \or % TOG
1094 \def\@journalName{ACM Transactions on Graphics}%
```

```
\def\@journalNameShort{ACM Trans. Graph.}%
     \def\@permissionCodeOne{0730-0301}
1096
1097 \or % TOIS
1098 \def\@journalName{ACM Transactions on Information Systems}%
    \def\@permissionCodeOne{1046-8188}%
1100 \or % TOIT
    \def\@journalName{ACM Transactions on Internet Technology}%
     \def\@journalNameShort{ACM Trans. Internet Technol.}%
    \def\@permissionCodeOne{1533-5399}%
1104 \or % TOMACS
1105 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
     \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
1107 \or % TOMM
1108 \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
     \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
    \def\@permissionCodeOne{1551-6857}%
1111 \def\@permissionCodeTwo{0100}%
1112 \or % TOMPECS
1113 \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
    \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1115 \def\@permissionCodeOne{2376-3639}%
1116 \or % TOMS
     \def\@journalName{ACM Transactions on Mathematical Software}%
1117
     \def\@journalNameShort{ACM Trans. Math. Softw.}%
1118
     \def\@permissionCodeOne{0098-3500}%
1120 \or % TOPC
    \def\@journalName{ACM Transactions on Parallel Computing}%
     \def\@journalNameShort{ACM Trans. Parallel Comput.}%
    \def\@permissionCodeOne{1539-9087}%
1124 \or % TOPS
1125 \def\@journalName{ACM Transactions on Privacy and Security}%
     \def\@journalNameShort{ACM Trans. Priv. Sec.}%
    \def\@permissionCodeOne{2471-2566}%
1128 \or % TOPLAS
     \def\@journalName{ACM Transactions on Programming Languages and Systems}%
     \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
    \def\@permissionCodeOne{0164-0925}%
1131
1132 \or % TOS
    \def\@journalName{ACM Transactions on Storage}%
     \def\@journalNameShort{ACM Trans. Storage}%
     \def\@permissionCodeOne{1553-3077}%
1136 \or % TOSEM
1137 \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
1138 \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
    \def\@permissionCodeOne{1049-331X}%
1140 \or % TOSN
    \def\@journalName{ACM Transactions on Sensor Networks}%
1142 \def\@journalNameShort{ACM Trans. Sensor Netw.}%
1143 \def\@permissionCodeOne{1550-4859}%
```

1144 \or % TQC

```
\def\@journalName{ACM Transactions on Quantum Computing}%
                     \def\@journalNameShort{ACM Trans. Quantum Comput.}%
                1146
                1147 \def\@permissionCodeOne{2643-6817}%
                1148 \or % TRETS
                1149 \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
                    \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
                1151
                    \def\@permissionCodeOne{1936-7406}%
                1152 \or % TSAS
                     \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
                1153
                     \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
                     \def\@permissionCodeOne{2374-0353}%
                1156 \or % TSC
                     \def\@journalName{ACM Transactions on Social Computing}%
                     \def\@journalNameShort{ACM Trans. Soc. Comput.}%
                     \def\@permissionCodeOne{2469-7818}%
                1160 \or % TSLP
                1161 \def\@journalName{ACM Transactions on Speech and Language Processing}%
                1162 \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
                1163 \def\@permissionCodeOne{1550-4875}%
                1164 \or % TWEB
                1165 \def\@journalName{ACM Transactions on the Web}%
                     \def\@journalNameShort{ACM Trans. Web}%
                1166
                1167 \def\@permissionCodeOne{1559-1131}%
                1168 \else % FACMP, a dummy journal
                1169 \def\@journalName{Forthcoming ACM Publication}%
                     \def\@journalNameShort{ACM Forthcoming}%
                     \def\@permissionCodeOne{XXXX-XXXX}%
                1171
                1172 \fi
                1173 \ClassInfo{\@classname}{Using journal code \@journalCode}%
                1175 \ClassError{\@classname}{Incorrect journal #1}%
                1176 }%
               And the syntactic sugar around it
  \acmJournal
                1177 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}%
                1178 \global\@ACM@journal@bibstriptrue}
                   The defaults:
                1179 \def\@journalCode@nr{0}
                1180 \def\@journalName{}%
                1181 \def\@journalNameShort{\@journalName}%
                1182 \def\@permissionCodeOne{XXXX-XXXX}%
                1183 \def\@permissionCodeTwo{}%
               This is the conference command
\acmConference
                1184 \newcommand\acmConference[4][]{%
                1185 \gdef\acmConference@shortname{#1}%
                     \gdef\acmConference@name{#2}%
                1186
                     \gdef\acmConference@date{#3}%
                1187
```

```
\gdef\acmConference@venue{#4}%
                        1188
                              \ifx\acmConference@shortname\@empty
                        1189
                                \gdef\acmConference@shortname{#2}%
                        1190
                             \fi
                        1191
                        1192 \global\@ACM@journal@bibstripfalse
                        1193 }
                        1194 \if@ACM@journal\else
                        1195 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
                        1196 DC, USA}%
                        1197 \fi
        \acmBooktitle The book title of the conference:
       \@acmBooktitle
                        1198 \def\acmBooktitle#1{\gdef\@acmBooktitle{#1}}
                        1199 \acmBooktitle{Proceedings of \acmConference@name
                                   \ifx\acmConference@name\acmConference@shortname\else
                                     \ (\acmConference@shortname)\fi}
                        1201
      \@editorsAbbrev How to abbreviate editors
                        1202 \def\@editorsAbbrev{(Ed.)}
         \@acmEditors The list of editors
                        1203 \def\@acmEditors{}
              \editor Add a new editor to the list
                        1204 \def\editor#1{\ifx\@acmEditors\@empty
                                \gdef\@acmEditors{#1}%
                        1206
                                \gdef\@editorsAbbrev{(Eds.)}%
                        1207
                                \g@addto@macro\@acmEditors{\and#1}%
                        1208
                        1209 \fi}
             \subtitle The subtitle macro
                        1210 \def\subtitle#1{\def\@subtitle{#1}}
                        1211 \subtitle{}
                        The total number of "groups". Each group is several authors with the same affiliations(s)
    \num@authorgroups
                        1212 \newcount\num@authorgroups
                        1213 \num@authorgroups=0\relax
         \num@authors
                        The total number of authors
                        1214 \newcount\num@authors
                        1215 \num@authors=0\relax
\if@insideauthorgroup Whether we are continuing an author group
                        1216 \newif\if@insideauthorgroup
                        1217 \@insideauthorgroupfalse
```

# \author Adding an author to the list of authors and addresses

```
1218 \renewcommand\author[2][]{%
              \footnote{Model} \ \footnote{M
1219
                          authors in the same \string\author\space macro!}}{}%
1220
1221
              \global\advance\num@authors by 1\relax
1222
              \if@insideauthorgroup\else
                    \global\advance\num@authorgroups\ by\ 1\relax
1223
                    \global\@insideauthorgrouptrue
1224
1225
              \ifx\addresses\@empty
1226
1227
                    \if@ACM@anonymous
                          \gdef\addresses{\@author{Anonymous Author(s)%
1228
                               \ifx\@acmSubmissionID\@empty\else\\Submission Id:
1229
                                    \@acmSubmissionID\fi}}%
1230
                          \gdef\authors{Anonymous Author(s)}%
1231
1232
                          \gdef\addresses{\@author{#2}}%
1233
1234
                          \gdef\authors{#2}%
1235
1236
              \else
                    \if@ACM@anonvmous\else
1237
                          \g@addto@macro\addresses{\and\@author{#2}}%
1238
                          \g@addto@macro\authors{\and#2}%
1239
                    \fi
1240
              \fi
1241
              \if@ACM@anonymous
1242
                    \ifx\shortauthors\@empty
1243
                          \gdef\shortauthors{Anon.
1244
                               \ifx\@acmSubmissionID\@empty\else Submission Id:
1245
                               \@acmSubmissionID\fi}%
1246
                    \fi
1247
1248
              \else
                    \def\@tempa{#1}%
1249
                    \ifx\@tempa\@empty
1250
                         \ifx\shortauthors\@empty
1251
                               \gdef\shortauthors{#2}%
1252
1253
                               \g@addto@macro\shortauthors{\and#2}%
1254
                          \fi
1255
                    \else
1256
                          \ifx\shortauthors\@empty
1257
                               \gdef\shortauthors{#1}%
1258
                          \else
1259
1260
                               \g@addto@macro\shortauthors{\and#1}%
1261
                          \fi
                    \fi
1262
1263
              \fi}
```

\affiliation The macro \affiliation mimics \address from amsart. Note that it has an optional

```
argument, which we use differently from amsart.
                                   1264 \newcommand{\affiliation}[2][]{%
                                   1265 \global\@insideauthorgroupfalse
                                        \if@ACM@anonymous\else
                                   1266
                                   1267
                                          \g@addto@macro\addresses{\affiliation{#1}{#2}}%
                                  Whether to use the author's punctuation (false by default, which adds American-style
@ACM@affiliation@obeypunctuation
                                   address punctuation)
                                   1269 \define@boolkey+{@ACM@affiliation@}[@ACM@affiliation@]{obeypunctuation}%
                                   1270 [true]{}{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}
          \additional affiliation Additional affiliations go to footnotes
                                   1271 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}
         \@additionalaffiliation Process \additionalaffiliation inside \authornote
                                   1272 \def\@additionalaffiliation#1{\bgroup
                                   1273 \def\position##1{\ignorespaces}%
                                   1274 \def\institution##1{##1\ignorespaces}%
                                   1275 \def\department{\@ifnextchar[{\@department}{\@department[]}}%
                                   1276 \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
                                   1277 \let\streetaddress\position
                                   1278 \let\city\position
                                   1279 \let\state\position
                                   1280 \let\postcode\position
                                   1281
                                        \let\country\position
                                   1282 Also with #1\unskip.\egroup}
                          \email The macro \email mimics \email from amsart. Again, it has an optional argument that
                                   we do not currently need but keep for possible future use.
                                   1283 \renewcommand{\email}[2][]{%
                                       \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
                                   1284
                                            addresses in the same \string\email\space macro!}}{}%
                                        \if@ACM@anonymous\else
                                          \g@addto@macro\addresses{\email{#1}{\#2}}\%
                                   1287
                                   1288 \fi}
                          \orcid Right now we do not typeset ORCIDs
                                   1289 \def\orcid#1{\unskip\ignorespaces}
               \authorsaddresses Setting up authors' addresses
                                   1290 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
                                   1291 \authorsaddresses{\@mkauthorsaddresses}
                    \@titlenotes The title notes
```

1292 \def\@titlenotes{}

```
\titlenote Adding a note to the title
                 1293 \def\titlenote#1{%
                      \g@addto@macro\@title{\footnotemark}%
                 1294
                      \if@ACM@anonymous
                 1295
                 1296
                        \g@addto@macro\@titlenotes{%
                           \stepcounter{footnote}\footnotetext{Title note}}%
                 1297
                 1298
                        \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
                 1299
                      \fi}
                 1300
\@subtitlenotes The subtitle notes
                 1301 \def\@subtitlenotes{}
  \subtitlenote Adding a note to the subtitle
                 1302 \def\subtitlenote#1{%
                      \g@addto@macro\@subtitle{\footnotemark}%
                 1303
                      \if@ACM@anonymous
                 1304
                        \g@addto@macro\@subtitlenotes{%
                 1305
                           \stepcounter{footnote}\footnotetext{Subtitle note}}%
                 1306
                 1307
                      \else
                 1308
                        \g@addto@macro\@subtitlenotes{%
                           \stepcounter{footnote}\footnotetext{#1}}%
                 1309
                 1310 \fi}
  \@authornotes The author notes
                 1311 \def\@authornotes{}
    \authornote Adding a note to the author
                 1312 \def\authornote#1{%
                      \if@ACM@anonymous\else
                 1313
                        \g@addto@macro\addresses{\@authornotemark}%
                 1314
                        \g@addto@macro\@authornotes{%
                 1315
                           \stepcounter{footnote}\footnotetext{#1}}%
                 1316
                      \fi}
                 1317
                 Adding a footnote mark to the authors
\authornotemark
                 1318 \newcommand\authornotemark[1][\relax]{%
                      \ifx#1\relax\relax\relax
                      \g@add to @macro \addresses {\@authornotemark}\%
                 1320
                 1321
                      \g@addto@macro\addresses{\@@authornotemark{#1}}%
                 1323 \fi}
                The current volume
     \acmVolume
                 1324 \def\acmVolume#1{\def\@acmVolume{#1}}
                 1325 \acmVolume{1}
                 The current number
     \acmNumber
                 1327 \acmNumber{1}
```

\acmArticle The current article 1328 \def\acmArticle#1{\def\@acmArticle{#1}} 1329 \acmArticle{} \acmArticleSeq The sequence number 1330 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}} 1331 \acmArticleSeq{\@acmArticle} \acmYear The current year 1332 \def\acmYear#1{\def\@acmYear{#1}} 1333 \acmYear{\the\year} \acmMonth The current month 1334 \def\acmMonth#1{\def\@acmMonth{#1}} 1335 \acmMonth{\the\month} \@acmPubDate The publication date  ${\tt 1336 \backslash def \backslash @acmPubDate \{ \backslash if case \backslash @acmMonth \backslash or \}}$ 1337 January\or February\or March\or April\or May\or June\or 1338 July\or August\or September\or October\or November\or 1339 December\fi~\@acmYear} \acmPrice The price 1340 \def\acmPrice#1{\def\@acmPrice{#1}} 1341 \acmPrice{15.00} \acmSubmissionID The submission ID 1342 \def\acmSubmissionID#1{\def\@acmSubmissionID{#1}} 1343 \acmSubmissionID{} \acmISBN The book ISBN 1344 \def\acmISBN#1{\def\@acmISBN{#1}} 1345 \acmISBN{978-x-xxxx-xxxx-x/YY/MM} \acmDOI The paper DOI 1346 \def\acmDOI#1{\def\@acmDOI{#1}} 1347 \acmDOI{10.1145/nnnnnnn.nnnnnnn) \if@ACM@badge Whether to print a badge. Note that either a left or right badge triggers it: 1348 \newif\if@ACM@badge 1349 \@ACM@badgefalse The width of the badge \@ACM@badge@width 1350 \newlength\@ACM@badge@width 1351 \setlength\@ACM@badge@width{5pc}

\@ACM@title@width The width of the badge

1352 \newlength\@ACM@title@width

```
\@ACM@badge@skip The space between the badge and the title
                 1353 \newlength\@ACM@badge@skip
                 1354 \setlength\@ACM@badge@skip{1pc}
     \acmBadgeR Setting the right badge
                 1355 \newcommand\acmBadgeR[2][]{\@ACM@badgetrue
                 1356 \def\@acmBadgeR@url{#1}%
                 1357 \def\@acmBadgeR@image{#2}}
                 1358 \def\@acmBadgeR@url{}
                 1359 \def\@acmBadgeR@image{ }
     \acmBadgeL Setting the left badge
                 1360 \newcommand\acmBadgeL[2][]{\@ACM@badgetrue
                 1361 \def\@acmBadgeL@url{#1}%
                 1362 \def\@acmBadgeL@image{#2}}
                 1363 \def\@acmBadgeL@url{}
                 1364 \def\@acmBadgeL@image{}
     \startPage
                 The start page of the paper
                 1365 \def\startPage#1{\def\@startPage{#1}}
                 1366 \startPage{}
         \terms Terms are obsolete. We use CCS now.
                 obsolete. I am going to ignore it}}
       \keywords Keywords are mostly obsolete. We use CCS now. Still it makes sense to keep them for
                 compatibility.
                 1369 \def\keywords#1{\def\@keywords{#1}}
                 1370 \let\@keywords\@empty
                 1371 \AtEndDocument{\if@ACM@nonacm\else\ifx\@keywords\@empty
                 1372 \ifnum\getrefnumber{TotPages}>2\relax
                 1373 \ClassWarningNoLine{\@classname}{ACM keywords are mandatory
                 1374
                         for papers over two pages}%
                 1375 \fi\fi\fi}
       abstract The amsart package puts abstract in a box. Since we do not know whether we will
                 use two-column mode, we prefer to save the text
                 1376 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
  \@saveabstract And saving the abstract
                 1377 \long\def\@saveabstract#1{\if@ACM@maketitle@typeset
                 1378 \ClassError{\@classname}{Abstract must be defined before maketitle
                 1379
                         command. Please move it!}\fi
                 1380 \long\gdef\@abstract{#1}}
```

1381 \@saveabstract{}

```
\@lempty The long version of \@empty (to compare with \@abstract)
                                                                 1382 \long\def\@lempty{}
        \if@ACM@printccs Whether to print CCS
                                                                 1383 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
                                                                                \if@ACM@printccs
                                                                                        \ClassInfo{\@classname}{Printing CCS}%
                                                                 1385
                                                                 1386 \else
                                                                 1387
                                                                                        \ClassInfo{\@classname}{Suppressing CCS}%
                                                                 fi}{ClassError{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\
                                                                Whether to print the ACM bibstrip
\if@ACM@printacmref
                                                                 1389 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
                                                                              \if@ACM@printacmref
                                                                                        \ClassInfo{\@classname}{Printing bibformat}%
                                                                 1391
                                                                                 \else
                                                                 1392
                                                                                        \ClassInfo{\@classname}{Suppressing bibformat}%
                                                                 1393
                                                                 1394 \fi{ClassError{\@classname}{The option printacmref can be either true or false}}
                                                                 1395 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@printacmref\else
                                                                 1396 \ifnum\getrefnumber{TotPages}>1\relax
                                                                                 \ClassWarningNoLine{\@classname}{ACM reference format is mandatory
                                                                                        for papers over one page}%
                                                                               \fi\fi\fi}
\if@ACM@printfolios Whether to print folios
                                                                 1400 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
                                                                 1401 \if@ACM@printfolios
                                                                                        \ClassInfo{\@classname}{Printing folios}%
                                                                 1402
                                                                 1403 \else
                                                                                        \ClassInfo{\@classname}{Suppressing folios}%
                                                                 1405 \fi}{\ClassError{\@classname}{The option printfolios can be either true or false}}
\@ACM@authorsperrow
                                                                 The number of authors per row. 0 means use the default algorithm.
                                                                 1406 \define@cmdkey{@ACM@topmatter@}[@ACM@]{authorsperrow}[0]{%
                                                                                 \footnote{Milnight of the continuous of the co
                                                                 1407
                                                                                               #1}}{\ClassWarning{\@classname}{The parameter authorsperrow must be
                                                                 1408
                                                                                               numerical. Ignoring the input #1}\gdef\@ACM@authorsperrow{0}}}
                                                                 1409
                                                                The usual syntactic sugar
                  \settopmatter
                                                                 1410 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
                                                                            Now the settings
                                                                 1411 \settopmatter{printccs=true, printacmref=true}
                                                                 1412 \if@ACM@manuscript
                                                                 1413 \settopmatter{printfolios=true}
                                                                 1414 \else
                                                                 1415 \if@ACM@journal
                                                                 1416
                                                                                        \settopmatter{printfolios=true}
```

```
\else
                1417
                        \settopmatter{printfolios=false}
                1418
                     \fi
                1419
                1420\fi
                1421 \settopmatter{authorsperrow=0}
    \@received The container for the paper history
                1422 \def\@received{}
     \received The \received command
                1423 \newcommand\received[2][]{\def\@tempa{#1}%
                1424
                     \ifx\@tempa\@empty
                        \ifx\@received\@empty
                1425
                          \gdef\@received{Received #2}%
                1426
                        \else
                1427
                          \g@addto@macro{\@received}{; revised #2}%
                1428
                1429
                1430
                      \else
                        \ifx\@received\@empty
                1431
                          \gdef\@received{#1 #2}%
                1432
                1433
                        \else
                1434
                          \g@addto@macro{\@received}{; #1 #2}%
                1435
                        \fi
                1436 \fi}
                1437 \AtEndDocument{%
                      \ifx\@received\@empty\else
                1438
                        \par\bigskip\noindent\small\normalfont\@received\par
                1439
                1440
                        Concepts system
                We exclude CCSXML stuff generated by the ACM system:
                1441 \RequirePackage{comment}
                1442 \excludecomment{CCSXML}
    \@concepts This is the storage macro and counter for concepts
                1443 \let\@concepts\@empty
                1444 \newcounter{@concepts}
      \ccsdesc The first argument is the significance, the second is the concept(s)
                1445 \newcommand\ccsdesc[2][100]{%
                     \ccsdesc@parse#1~#2~~\ccsdesc@parse@end}
                1446
                The parser of the expression Significance General Specific (we need textcomp for
\ccsdesc@parse
                \textrightarrow). Note that Specific can be empty!
                1447 \RequirePackage{textcomp}
                1448 \def\ccsdesc@parse#1~#2~#3~{%
                1449 \stepcounter{@concepts}%
```

```
\expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
                      1451
                               \textbf{#2}}%
                      1452
                             \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{; }%
                      1453
                             \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
                      1454
                           \label{lem:ccsq} $$ \g@addto@macro{\ensuremath{\csname} \ccsgGeneral@#2\endcsname} $$
                      1455
                             \csname CCS@Punctuation@#2\endcsname
                      1456
                             \csname CCS@Specific@#2\endcsname}%
                      1457
                           \fi
                      1458
                           \ifx#3\relax\relax\else
                      1459
                             \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
                      1460
                               \textrightarrow\ }%
                      1461
                            \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
                      1462
                              \addtocounter{@concepts}{-1}%
                      1463
                              1464
                              1465
                              #3\fi\fi\inum\value{@concepts}=0.\else; \fi}%
                      1466
                           \fi
                      1467
                      1468 \ccsdesc@parse@finish}
                      1469 \AtEndDocument{\if@ACM@nonacm\else\ifx\@concepts\@empty\relax
                           \ifnum\getrefnumber{TotPages}>2\relax
                      1471
                           \ClassWarningNoLine{\@classname}{CCS concepts are mandatory
                      1472
                             for papers over two pages}%
                      1473
                           \fi\fi\fi}
                     Gobble everything to \ccsdesc@parse@end
\ccdesc@parse@finish
                      1474 \def\ccsdesc@parse@finish#1\ccsdesc@parse@end{}
                             Copyright system
                      3.14
                      This is from acmcopyright.sty
                     Whether to print a copyright symbol
 \if@printcopyright
                      1475 \newif\if@printcopyright
                      1476 \@printcopyrighttrue
 \if@printpermission
                     Whether to print the permission block
                      1477 \newif\if@printpermission
                      1478 \@printpermissiontrue
        \if@acmowned Whether the ACM owns the rights to the paper
                      1479 \newif\if@acmowned
                      1480 \@acmownedtrue
                         Keys:
                      1481 \define@choicekey*{ACM@}{acmcopyrightmode}[%
                          \acm@copyrightinput\acm@copyrightmode]{none,%
                             acmcopyright,acmlicensed,rightsretained,%
```

\expandafter\ifx\csname CCS@General@#2\endcsname\relax

1450

```
usgov,usgovmixed,cagov,cagovmixed,licensedusgovmixed,%
1484
       {\tt licensed cagov, licensed cagov mixed, other gov, licensed other gov, \%}
1485
       iw3c2w3,iw3c2w3g}{%
1486
     \@printpermissiontrue
1487
     \@printcopyrighttrue
1488
     \@acmownedtrue
1489
1490
     \ifnum\acm@copyrightmode=0\relax % none
      \@printpermissionfalse
1491
      \@printcopyrightfalse
1492
      \@acmownedfalse
1493
     \fi
1494
     \ifnum\acm@copyrightmode=2\relax % acmlicensed
      \@acmownedfalse
1497
     \ifnum\acm@copyrightmode=3\relax % rightsretained
1498
      \@acmownedfalse
1499
      \AtBeginDocument{\acmPrice{}}%
1500
1501
1502
     \ifnum\acm@copyrightmode=4\relax % usgov
1503
      \@printpermissiontrue
      \@printcopyrightfalse
1504
      \@acmownedfalse
1505
      \AtBeginDocument{\acmPrice{}}%
1506
1507
     \ifnum\acm@copyrightmode=6\relax % cagov
1508
      \@acmownedfalse
1509
1510
     \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1511
      \@acmownedfalse
1512
     \fi
1513
     \ifnum\acm@copyrightmode=9\relax % licensedcagov
1514
1515
      \@acmownedfalse
1516
     \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1517
      \@acmownedfalse
1518
     \fi
1519
     \ifnum\acm@copyrightmode=11\relax % othergov
1520
      \@acmownedtrue
1521
1522
     \ifnum\acm@copyrightmode=12\relax % licensedothergov
1523
1524
      \@acmownedfalse
1525
     \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1526
      \@acmownedfalse
1527
1528
      \AtBeginDocument{\acmPrice{}}%
1529
1530
     \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
      \@acmownedfalse
1531
      \AtBeginDocument{\acmPrice{}}%
1532
```

1533

\fi}

```
\setcopyright This is the syntactic sugar around setting keys.
                       1534 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
                       1535 \setcopyright{acmcopyright}
     \@copyrightowner Here is the owner of the copyright
                       1536 \def\@copyrightowner{%
                       1537 \ifcase\acm@copyrightmode\relax % none
                       1538 \or % acmcopyright
                       1539 Association for Computing Machinery.
                       1540 \or % acmlicensed
                       1541 Copyright held by the owner/author(s). Publication rights licensed to
                       1542 ACM\@.
                            \or % rightsretained
                       1543
                             Copyright held by the owner/author(s).
                       1544
                       1545
                             \or % usgov
                       1546 \or % usgovmixed
                       1547 Association for Computing Machinery.
                       1548 \or % cagov
                       1549 Crown in Right of Canada.
                       1550 \or %cagovmixed
                       1551 Association for Computing Machinery.
                       1552 \or %licensedusgovmixed
                       1553 Copyright held by the owner/author(s). Publication rights licensed to
                       1554 ACM\@.
                       1555 \or % licensedcagov
                            Crown in Right of Canada. Publication rights licensed to
                       1557 ACM\@.
                       1558
                             \or %licensedcagovmixed
                       1559 Copyright held by the owner/author(s). Publication rights licensed to
                       1560 ACM\@.
                       1561 \or % othergov
                       1562 Association for Computing Machinery.
                       1563 \or % licensedothergov
                       1564 Copyright held by the owner/author(s). Publication rights licensed to
                       1565 ACM\@.
                       1566 \or % ic2w3www
                       1567 IW3C2 (International World Wide Web Conference Committee), published
                       under Creative Commons CC-BY~4.0 License.
                       1569 \or % ic2w3wwwgoogle
                       1570 IW3C2 (International World Wide Web Conference Committee), published
                             under Creative Commons CC-BY-NC-ND~4.0 License.
                       1572 \fi}
          \@formatdoi Print a clickable DOI
                       {\tt 1573 \setminus def \setminus @formatdoi\#1{\setminus url{https://doi.org/\#1}}}
\@copyrightpermission The canned permission block.
                       1574 \def\@copyrightpermission{%
```

1575 \ifcase\acm@copyrightmode\relax % none

- 1576 \or % acmcopyright
- 1577 Permission to make digital or hard copies of all or part of this
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                        only.
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                        International (CC-BY~4.0) license. Authors reserve their rights to
                        disseminate the work on their personal and corporate Web sites with
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                 1689
                 1690 \or % iw3c2w3g
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                 1692
                        (CC-BY-NC-ND~4.0) license. Authors reserve their rights to
                  1693
                        disseminate the work on their personal and corporate Web sites with
                 1695
                        the appropriate attribution.
                 By default, the copyright year is the same as \acmYear, but one can override this:
 \copyrightyear
                 1697 \def\copyrightyear#1{\def\@copyrightyear{#1}}
                 1698 \copyrightyear{\@acmYear}
\@teaserfigures The teaser figures container
                 1699 \def\@teaserfigures{}
   teaserfigure The teaser figure
                 1700 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}
   \@saveteaser Saving the teaser
                 \label{longdef} $$1701 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}$
                 We redefine amsart \thanks so the anonymous key works
                 1702 \renewcommand{\thanks}[1]{%
                 1703
                       \@ifnotempty{#1}{%
                         \if@ACM@anonymous
                 1704
                 1705
                           \g@addto@macro\thankses{\thanks{A note}}%
                 1706
                         \g@addto@macro\thankses{\thanks{#1}}%
                 1707
                 1708
                        \fi}}
```

# 3.15 Typesetting top matter

\mktitle@bx

Some of our formats use a two-column design. Some use a one-column design. In all cases we use a wide title. Thus we typeset the top matter in a special box to be used in the construction  $\theta$ .

1709 \newbox\mktitle@bx

\maketitle The (in)famous \maketitle. Note that in sigchi-a mode, authors are *not* in the title

Another note: there is a subtle difference between author notes, title notes and thanks. The latter two refer to the paper itself and therefore belong to the copyright/permission block. By the way, this was the default behavior of the old ACM classes.

```
1710 \def\maketitle{%
1711
     \@ACM@maketitle@typesettrue
1712
     \if@ACM@anonymous
       % Anonymize omission of \author-s
1713
       \ifnum\num@authorgroups=0\author{}\fi
1714
     \fi
1715
     \begingroup
1716
     \let\@vspace\@vspace@orig
1717
     \let\@vspacer\@vspacer@orig
     \let\@footnotemark\@footnotemark@nolink
     \let\@footnotetext\@footnotetext@nolink
     \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1721
     \hsize=\textwidth
1722
     \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1723
1724
     \@mktitle\if@ACM@sigchiamode\else\@mkauthors\fi\@mkteasers
1725
     \@printtopmatter
     \if@ACM@sigchiamode\@mkauthors\fi
1726
     \setcounter{footnote}{0}%
1727
     \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1728
     \@titlenotes
1729
     \@subtitlenotes
1730
     \@authornotes
     \let\@makefnmark\relax
     \let\@thefnmark\relax
     \let\@makefntext\noindent
1734
     \ifx\@empty\thankses\else
1735
       \footnotetextauthorsaddresses{%
1736
1737
         \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1738
     \ifx\@empty\@authorsaddresses\else
1739
        \if@ACM@anonymous\else
1740
          \if@ACM@journal@bibstrip
1741
            \footnotetextauthorsaddresses{%
1742
              \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
1743
          \fi
1744
        \fi
1745
1746
     \if@ACM@nonacm\else\footnotetextcopyrightpermission{%
1747
       \if@ACM@authordraft
1748
           1749
1750
               Unpublished working draft. Not for distribution.}}%
1751
          \color[gray]{0.9}%
1752
       \fi
       \parindent\z@\parskip0.1\baselineskip
1753
```

```
\if@ACM@authorversion\else
1754
        \if@printpermission\@copyrightpermission\par\fi
1755
       \fi
1756
       \if@ACM@manuscript\else
1757
          \if@ACM@journal@bibstrip\else % Print the conference information
1758
1759
         1760
          \fi
1761
       \if@printcopyright
1762
         \copyright\ \@copyrightyear\ \@copyrightowner\\
1763
       \else
1764
1765
         \@copyrightyear.\
       \fi
1766
       \if@ACM@manuscript
1767
        Manuscript submitted to ACM\\
1768
       \else
1769
        \if@ACM@authorversion
1770
            This is the author's version of the work. It is posted here for
1771
1772
            your personal use. Not for redistribution. The definitive Version
1773
            of Record was published in
            \if@ACM@journal@bibstrip
1774
               \emph{\@journalName}%
1775
            \else
1776
               \emph{\@acmBooktitle}%
1777
1778
            \fi
1779
            \ifx\@acmDOI\@empty
1780
            \else
1781
               , \ensuremath{\texttt{QacmDOI}}.
1782
            \fi\\
1783
           \else
1784
1785
            \if@ACM@nonacm\else
1786
              \if@ACM@journal@bibstrip
                \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1787
                \ifx\@acmPrice\@empty\else\ \$\@acmPrice\fi\\
1788
                \@formatdoi{\@acmDOI}%
1789
              \else % Conference
1790
                1791
1792
                \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\\\fi
                \int \mathbb{Q}_{\mathbb{Q}}\
1793
1794
              \fi
            \fi
1795
           \fi
1796
        \fi}
1797
1798
       \fi
1799
     \endgroup
1800
     \setcounter{footnote}{0}%
1801
     \@mkabstract
     \if@ACM@printccs
1802
     \ifx\@concepts\@empty\else\bgroup
1803
```

```
\@concepts\par}\egroup
                   1805
                            \fi
                   1806
                          \fi
                   1807
                          \ifx\@keywords\@empty\else\bgroup
                   1808
                   1809
                             {\if@ACM@journal
                   1810
                                 \@specialsection{Additional Key Words and Phrases}%
                              \else
                   1811
                                 \@specialsection{Keywords}%
                   1812
                              \fi
                   1813
                                 \@keywords}\par\egroup
                   1814
                   1815
                          \fi
                         \andify\authors
                   1816
                         \andify\shortauthors
                   1817
                         \global\let\authors=\authors
                   1818
                         \global\let\shortauthors=\shortauthors
                   1819
                         \if@ACM@printacmref
                   1820
                            \@mkbibcitation
                   1821
                   1822
                         \fi
                   1823
                         \hypersetup{%
                           pdfauthor={\authors},
                   1824
                           pdftitle={\@title},
                   1825
                           pdfsubject={\@concepts},
                   1826
                           pdfkeywords={\@keywords},
                   1827
                           pdfcreator={LaTeX with acmart
                   1828
                   1829
                             \csname ver@acmart.cls\endcsname\space
                             and hyperref
                   1830
                             \csname ver@hyperref.sty\endcsname}}%
                   1831
                         \global\@topnum\z@ % this prevents floats from falling
                   1832
                                             \% at the top of page 1
                   1833
                         \global\@botnum\z@ % we do not want them to be on the bottom either
                   1834
                   1835
                         \@printendtopmatter
                   1836
                         \@afterindentfalse
                         \@afterheading
                   1837
                   1838 }
                   This macro starts sections for proceedings and uses \small for journals
\@specialsection
                   1839 \def\@specialsection#1{%
                         \bgroup
                   1840
                         \let\@vspace\@vspace@orig
                   1841
                         \let\@vspacer\@vspacer@orig
                   1842
                         \ifcase\ACM@format@nr
                   1843
                         \relax % manuscript
                           \par\medskip\small\noindent#1: %
                   1845
                         \or % acmsmall
                   1846
                           \par\medskip\small\noindent#1: %
                   1847
                         \or % acmlarge
                   1848
                           \par\medskip\small\noindent#1: %
                   1849
                   1850
                         \or % acmtog
                   1851
                           \par\medskip\small\noindent#1: %
```

{\@specialsection{CCS Concepts}%

1804

```
\or % sigconf
1852
                                                                                   \section*{#1}%
1853
                                                              \or % siggraph
1854
                                                                                   \section*{#1}%
1855
1856
                                                              \or % sigplan
1857
                                                                                   \paragraph*{#1}%
1858
                                                              \or % sigchi
1859
                                                                                   \section*{#1}%
                                                              \or % sigchi-a
1860
                                                                                   \schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1}{\schinn{1
1861
1862
                                                                                   \fi
                                                              \egroup}
```

\@printtopmatter

The printing of top matter starts a new page and uses the given title box. Note that for sigchi-a we print badges here rather than in \mktitle since we want them in the margins.

```
1864 \def\@printtopmatter{%
     \ifx\@startPage\@empty
1865
         \gdef\@startPage{1}%
1866
     \else
1867
         \setcounter{page}{\@startPage}%
1868
     \fi
1869
1870
     \thispagestyle{firstpagestyle}%
1871
     \noindent
     \ifcase\ACM@format@nr
1872
     \relax % manuscript
1873
       \box\mktitle@bx\par
1874
     \or % acmsmall
1875
       \box\mktitle@bx\par
1876
     \or % acmlarge
1877
       \box\mktitle@bx\par
1878
     \or % acmtog
1879
       \twocolumn[\box\mktitle@bx]%
1880
     \or % sigconf
1881
       \twocolumn[\box\mktitle@bx]%
1882
1883
     \or % siggraph
1884
       \twocolumn[\box\mktitle@bx]%
     \or % sigplan
1885
       \twocolumn[\box\mktitle@bx]%
1886
     \or % sigchi
1887
       \twocolumn[\box\mktitle@bx]%
1888
     \or % sigchi-a
1889
       \par\box\mktitle@bx\par\bigskip
1890
        \if@ACM@badge
1891
           \marginpar{\noindent
1892
             \ifx\@acmBadgeL@image\@empty\else
1893
               \href{\@acmBadgeL@url}{%
1894
                 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1895
1896
                \hskip\@ACM@badge@skip
              \fi
1897
```

```
\ifx\@acmBadgeR@image\@empty\else
              1898
                              \href{\@acmBadgeR@url}{%
              1899
                                \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
              1900
                            \fi}%
              1901
                      \fi
              1902
              1903
                   \fi
              1904 }
  \@mktitle The title of the article
              1905 \def\@mktitle{%
                   \ifcase\ACM@format@nr
              1906
              1907
                    \relax % manuscript
                      \@mktitle@i
              1908
                   \or % acmsmall
              1909
                      \@mktitle@i
              1910
                   \or % acmlarge
              1911
                      \@mktitle@i
              1912
              1913
                   \or % acmtog
                      \@mktitle@i
              1914
              1915
                   \or % sigconf
                      \@mktitle@iii
              1916
                    \or % siggraph
              1917
                      \@mktitle@iii
              1918
              1919
                    \or % sigplan
              1920
                      \@mktitle@iii
                    \or % sigchi
              1921
                      \@mktitle@iii
              1922
                    \or % sigchi-a
              1923
                      \@mktitle@iv
              1924
                   \fi
              1925
              1926 }
\@titlefont The font to typeset the title
              1927 \def\@titlefont{%
                   \ifcase\ACM@format@nr
              1928
              1929
                    \relax % manuscript
              1930
                      \LARGE\sffamily\bfseries
                   \or % acmsmall
              1931
                      \LARGE\sffamily\bfseries
              1932
                   \or % acmlarge
              1933
                      \LARGE\sffamily\bfseries
              1934
                   \or % acmtog
              1935
                      \Huge\sffamily
              1936
                    \or % sigconf
              1937
                      \Huge\sffamily\bfseries
              1938
                    \or % siggraph
              1939
                      \Huge\sffamily\bfseries
              1940
                    \or % sigplan
              1941
              1942
                      \Huge\bfseries
              1943
                    \or % sigchi
```

```
\Huge\sffamily\bfseries
                1944
                     \or % sigchi-a
                1945
                        \Huge\bfseries
                1946
                     \fi}
                1947
\@subtitlefont
                The font to typeset the subtitle
                1948 \def\@subtitlefont{\normalsize
                     \ifcase\ACM@format@nr
                1949
                     \relax % manuscript
                1950
                1951
                       \mdseries
                1952
                     \or % acmsmall
                       \mdseries
                1953
                     \or % acmlarge
                1954
                       \mdseries
                1955
                     \or % acmtog
                1956
                        \LARGE
                1957
                     \or % sigconf
                1958
                        \LARGE\mdseries
                1959
                     \or % siggraph
                1960
                        \LARGE\mdseries
                1961
                     \or % sigplan
                1962
                        \LARGE\mdseries
                1963
                1964
                     \or % sigchi
                1965
                        \LARGE\mdseries
                     \or % sigchi-a
                1966
                        \mdseries
                1967
                     \fi}
                1968
                The version of \mktitle for most journals
  \@mktitle@i
                1969 \def\@mktitle@i{\hsize=\textwidth
                     \@ACM@title@width=\hsize
                     \ifx\@acmBadgeL@image\@empty\else
                1971
                       \advance\@ACM@title@width by -\@ACM@badge@width
                1972
                       \advance\@ACM@title@width by -\@ACM@badge@skip
                1973
                     \fi
                1974
                1975
                     \ifx\@acmBadgeR@image\@empty\else
                       \advance\@ACM@title@width by -\@ACM@badge@width
                1976
                       \advance\@ACM@title@width by -\@ACM@badge@skip
                1977
                1978
                     \setbox\mktitle@bx=\vbox{\noindent\@titlefont
                1979
                       \ifx\@acmBadgeL@image\@empty\else
                1980
                         1981
                             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
                1982
                         \hskip\@ACM@badge@skip
                1983
                1984
                       \parbox[t]{\@ACM@title@width}{\raggedright
                1985
                         \@titlefont\noindent
                1986
                         \@title
                1987
                1988
                     \footnote{Model} \
                       \par\noindent{\@subtitlefont\@subtitle}
```

```
\fi}%
              1990
                   \ifx\@acmBadgeR@image\@empty\else
              1991
                     \hskip\@ACM@badge@skip
              1992
                     1993
                         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
              1994
              1995
                   \fi
              1996
                   \par\bigskip}}%
              The version of \mktitle for TOG. Since v1.06, this is subsumed by the \mktitle@i
\@mktitle@ii
\@mktitle@iii
              The version of \@mktitle for SIG proceedings. Note that since the title is centered, we
              leave space for the left badge even if only the right badge is defined.
              1997 \def\@mktitle@iii{\hsize=\textwidth
                     \setbox\mktitle@bx=\vbox{\@titlefont\centering
              1998
                       \@ACM@title@width=\hsize
              1999
                       \if@ACM@badge
              2000
                         \advance\@ACM@title@width by -2\@ACM@badge@width
              2001
                         \advance\@ACM@title@width by -2\@ACM@badge@skip
              2002
                         \parbox[b]{\@ACM@badge@width}{\strut
              2003
                           \ifx\@acmBadgeL@image\@empty\else
              2004
                             2005
              2006
                             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
              2007
                           \fi}%
                         \hskip\@ACM@badge@skip
              2008
              2009
                       \parbox[t]{\@ACM@title@width}{\centering\@titlefont
              2010
                         \@title
              2011
                         \ifx\@subtitle\@empty\else
              2012
                           \par\noindent{\@subtitlefont\@subtitle}
              2013
                         \fi
              2014
                       }%
              2015
                       \if@ACM@badge
              2016
                         \hskip\@ACM@badge@skip
              2017
                         \parbox[b]{\@ACM@badge@width}{\strut
              2018
              2019
                           \ifx\@acmBadgeR@image\@empty\else
                             2020
                             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
              2021
              2022
                           \fi}%
                       \fi
              2023
                       \par\bigskip}}%
              2024
              The version of \@mktitle for sigchi-a
\@mktitle@iv
              2025 \def\@mktitle@iv{\hsize=\textwidth
                     \setbox\mktitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
              2026
                       \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
              2027
                       \noindent\@title
              2028
                      \ifx\@subtitle\@empty\else
              2029
                        \par\noindent\@subtitlefont\@subtitle
              2030
              2031
                      \fi
```

```
2032 \par\bigskip}}%
```

\@ACM@addtoaddress

This macro adds an item to the address using the following rules:

- 1. If we start a paragraph, add the item
- 2. Otherwise, add a comma and the item
- However, the comma is deleted if it is at the end of a line. We use the magic \cleaders trick for this.

```
2033 \newbox\@ACM@commabox
              2034 \def\@ACM@addtoaddress#1{%
              2035 \ifvmode\else
                     \if@ACM@affiliation@obeypunctuation\else
              2037
                     \setbox\@ACM@commabox=\hbox{, }%
                     \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
              2038
                   \fi\fi
              2039
                   #1}
              2040
 \institution Theoretically we can define the macros for \affiliation inside the \@mkauthors-style
              commands. However, this would lead to a strange error if an author uses them outside
    \position
  \department \affiliation. Of course we can make them produce an error message, but...
\streetaddress 2041 \def\streetaddress#1{\unskip\ignorespaces}
        \city 2042 \def\postcode#1{\unskip\ignorespaces}
       \state 2043 \if@ACM@journal
    \postcode 2044
                   \def\position#1{\unskip\ignorespaces}
                   \def\institution#1{\unskip~#1\ignorespaces}
              2045
     \country
                   \def\city#1{\unskip\ignorespaces}
              2047 \def\state#1{\unskip\ignorespaces}
              2048 \newcommand\department[2][0]{\unskip\ignorespaces}
              2049 \def\country#1{\if@ACM@affiliation@obeypunctuation\else, \fi#1\ignorespaces}
                   \def\position#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
              2051
                   \def\institution#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
              2052
                   2053
                     #2\else#2\par\fi}%
              2054
              \let\city\@ACM@addtoaddress
                   \let\state\@ACM@addtoaddress
              2058% \def\postcode#1{\if@ACM@affiliation@obeypunctuation#1\else\unskip\space#1\fi}%
              2059 \let\country\@ACM@addtoaddress
              2060\fi
              Typesetting the authors
  \@mkauthors
              2061 \def\@mkauthors{\begingroup
              2062 \hsize=\textwidth
                   \ifcase\ACM@format@nr
              2064
                   \relax % manuscript
                     \@mkauthors@i
              2065
```

```
\or % acmsmall
                    2066
                           \@mkauthors@i
                    2067
                         \or % acmlarge
                    2068
                           \@mkauthors@i
                    2069
                    2070
                         \or % acmtog
                    2071
                           \@mkauthors@i
                    2072
                         \or % sigconf
                           \@mkauthors@iii
                    2073
                         \or % siggraph
                    2074
                           \@mkauthors@iii
                    2075
                         \or % sigplan
                    2076
                    2077
                           \@mkauthors@iii
                         \or % sigchi
                    2078
                           \@mkauthors@iii
                    2079
                         \or % sigchi-a
                    2080
                           \@mkauthors@iv
                    2081
                         \fi
                    2082
                         \endgroup
                    2083
                    2084 }
     \@authorfont Somehow different conferences use different fonts for author names. Why?
                    2085 \def\@authorfont{\Large\sffamily}
\@affiliationfont Font for affiliations
                    2086 \def\@affiliationfont{\normalsize\normalfont}
                       Adjusting fonts for different formats
                    2087 \ifcase\ACM@format@nr
                    2088 \relax % manuscript
                    2089 \or % acmsmall
                    2090 \def\@authorfont{\large\sffamily}
                    2091 \def\@affiliationfont{\small\normalfont}
                    2092 \or % acmlarge
                    2093 \or % acmtog
                    2094 \def\@authorfont{\LARGE\sffamily}
                    2095 \def\@affiliationfont{\large}
                    2096 \or % sigconf
                    2097 \def\@authorfont{\LARGE}
                         \def\@affiliationfont{\large}
                    2098
                    2099 \or % siggraph
                    2100 \def\@authorfont{\normalsize\normalfont}
                         \def\@affiliationfont{\normalsize\normalfont}
                    2102 \or % sigplan
                    2103 \def\@authorfont{\Large\normalfont}
                    2104 \def\@affiliationfont{\normalsize\normalfont}
                    2105 \or % sigchi
                    2106 \def\@authorfont{\bfseries}
                    2107 \def\@affiliationfont{\mdseries}
                    2108 \or % sigchi-a
```

```
\def\@authorfont{\bfseries}
                              \def\@affiliationfont{\mdseries}
                        2110
                        2111 \fi
                        At this point we have \@currentauthors and \@currentaffiliations. We typeset
\@typeset@author@line
                        them in the journal style
                        2112 \def\@typeset@author@line{%
                             \andify\@currentauthors\par\noindent
                        2113
                              \@currentauthors\def\@currentauthors{}%
                        2114
                              \ifx\@currentaffiliations\@empty\else
                        2115
                                \andify\@currentaffiliations
                        2116
                        2117
                                  \unskip, {\@currentaffiliations}\par
                              \fi
                        2118
                              \def\@currentaffiliations{}}
        \@mkauthors@i
                        This version is used in most journal formats. Note that \and between authors with the
                        same affiliation becomes _and_:
                        2120 \def\@mkauthors@i{%
                              \def\@currentauthors{}%
                        2121
                              \def\@currentaffiliations{}%
                              \global\let\and\@typeset@author@line
                        2123
                              \def\@author##1{%
                        2124
                                \ifx\@currentauthors\@empty
                        2125
                                  \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
                        2126
                                \else
                        2127
                                   \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
                        2128
                                \fi
                        2129
                                2130
                              \def\email##1##2{}%
                        2131
                              \def\affiliation##1##2{%
                        2132
                                \def\@tempa{\##2}\ifx\@tempa\@empty\else
                        2133
                                   \ifx\@currentaffiliations\@empty
                        2134
                                      \gdef\@currentaffiliations{%
                        2135
                                         \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
                        2136
                                         \setkeys{@ACM@affiliation@}{##1}%
                        2137
                                         \@affiliationfont##2}%
                        2138
                                   \else
                        2139
                                     \g@add to @macro {\current affiliations} {\current affiliations} and
                        2140
                                        \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
                        2141
                                        \setkeys{@ACM@affiliation@}{##1}##2}%
                        2142
                                  \fi
                        2143
                        2144
                                 \global\let\and\@typeset@author@line}%
                        2145
                              \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
                        2146
                                \noindent\addresses\@typeset@author@line
                        2147
                               \par\medskip}%
                        2148
                        2149 }
```

The \@mkauthors@ii command was the version used in acmtog. It is no longer neces-

\@mkauthors@ii

sary.

```
\author@bx The box to put an individual author in
                     2150 \newbox\author@bx
      \author@bx@wd
                     The width of the author box
                     2151 \newdimen\author@bx@wd
     \author@bx@sep
                     The separation between author boxes
                     2152 \newskip\author@bx@sep
                     2153 \author@bx@sep=1pc\relax
\@typeset@author@bx
                     Typesetting the box with authors. Note that in sigchi-a the box is not centered.
                     2154 \def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd
                           \def\and{\par}\normalbaselines
                           \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
                     2156
                             \@authorfont\@currentauthors\par\@affiliationfont
                     2157
                     2158
                             \@currentaffiliation}\egroup
                           \box\author@bx\hspace{\author@bx@sep}%
                     2159
                           \gdef\@currentauthors{}%
                     2160
```

\@mkauthors@iii The sigconf version. Here we use a centered design with each author in a separate box. 2162 \def\@mkauthors@iii{%

\gdef\@currentaffiliation{}}

First, we need to determine the design of the author strip. The boxes are separated by  $\author@bx@sep$  plus two  $\author@bx@sep$  margins. This means that each box must be of width ( $\author@bx@sep$ )/N -  $\author@bx@sep$ , where N is the number of boxes per row.

```
\author@bx@wd=\textwidth\relax
2164
     \advance\author@bx@wd by -\author@bx@sep\relax
2165
     \ifnum\@ACM@authorsperrow>0\relax
       \divide\author@bx@wd by \@ACM@authorsperrow\relax
2166
2167
     \else
2168
       \ifcase\num@authorgroups
2169
       \relax % 0?
       \or % 1=one author per row
2170
2171
       \or % 2=two authors per row
          \divide\author@bx@wd by \num@authorgroups\relax
2172
       \or % 3=three authors per row
2173
          \divide\author@bx@wd by \num@authorgroups\relax
2174
2175
       \or % 4=two authors per row (!)
          \divide\author@bx@wd by 2\relax
2176
2177
       \else % three authors per row
          \divide\author@bx@wd by 3\relax
2178
2179
       \fi
2180
     \fi
     \advance\author@bx@wd by -\author@bx@sep\relax
Now, parsing of \addresses:
2182 \gdef\@currentauthors{}%
```

```
\gdef\@currentaffiliation{}%
2183
     \def\@author##1{\ifx\@currentauthors\@empty
2184
       \gdef\@currentauthors{\par##1}%
2185
2186
     \else
       \g@addto@macro\@currentauthors{\par##1}%
2187
     \fi
2188
     2189
     \def\email##1##2{\ifx\@currentaffiliation\@empty
2190
       \gdef\@currentaffiliation{\bgroup
2191
         \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2192
2193
     \else
       \g@addto@macro\@currentaffiliation{\par\bgroup
2194
         \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2195
2196
     \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2197
       \gdef\@currentaffiliation{%
2198
         \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2199
         \setkeys{@ACM@affiliation@}{##1}##2}%
2200
     \else
2201
       \g@addto@macro\@currentaffiliation{\par
2202
         \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2203
         \setkeys{@ACM@affiliation@}{##1}##2}%
2204
     \fi
2205
     \global\let\and\@typeset@author@bx
2206
2207 }%
Actual typesetting is done by the \and macro:
     \hsize=\textwidth
2208
     \global\setbox\mktitle@bx=\vbox{\noindent
       \box\mktitle@bx\par\medskip\leavevmode
2210
2211
       \lineskip=1pc\relax\centering\hspace*{-1em}%
       2212
```

\@mkauthors@iv

The sigchi-a version. We put authors in the main text with no more than 2 authors per line, unless overriden.

```
2213 \def\@mkauthors@iv{%
```

First, we need to determine the design of the author strip. The boxes are separated by  $\author@bx@sep$  plus two  $\author@bx@sep$  margins. This means that each box must be of width ( $\author@bx@sep$ )/N –  $\author@bx@sep$ , where N is the number of boxes per row.

```
\author@bx@wd=\columnwidth\relax
2214
     \advance\author@bx@wd by -\author@bx@sep\relax
2215
     \ifnum\@ACM@authorsperrow>0\relax
2216
       \divide\author@bx@wd by \@ACM@authorsperrow\relax
2217
     \else
2218
       \ifcase\num@authorgroups
2219
       \relax % 0?
2220
       \or % 1=one author per row
2221
       \else % 2=two authors per row
2222
```

```
\fi
                       2224
                            \fi
                       2225
                            \advance\author@bx@wd by -\author@bx@sep\relax
                       2226
                       Now, parsing of \addresses:
                            \gdef\@currentauthors{}%
                       2227
                       2228
                            \gdef\@currentaffiliation{}%
                            \def\@author##1{\ifx\@currentauthors\@empty
                              \gdef\@currentauthors{\par##1}%
                       2230
                            \else
                       2231
                              \g@addto@macro\@currentauthors{\par##1}%
                       2232
                            \fi
                       2233
                            2234
                            \def\email##1##2{\ifx\@currentaffiliation\@empty
                       2235
                              \gdef\@currentaffiliation{\nolinkurl{##2}}%
                       2236
                       2237
                              \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
                       2238
                            \fi}%
                       2239
                            \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
                       2240
                       2241
                              \gdef\@currentaffiliation{%
                                 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
                       2242
                                      \setkeys{@ACM@affiliation@}{##1}##2}%
                       2243
                            \else
                       2244
                              \g@addto@macro\@currentaffiliation{\par
                       2245
                                 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
                       2246
                                 \setkeys{@ACM@affiliation@}{##1}##2}%
                       2247
                            \fi
                       2248
                       2249
                            \global\let\and\@typeset@author@bx}%
                       2250 %
                       Actual typesetting is done by the \and macro
                              \bgroup\hsize=\columnwidth
                               \par\raggedright\leftskip=\z@
                       2252
                              \lineskip=1pc\noindent
                       2253
                              \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}
                       2254
\@mkauthorsaddresses
                       Typesetting authors' addresses in the footnote style
                       2255 \def\@mkauthorsaddresses{%
                       2256
                            \ifnum\num@authors>1\relax
                            Authors' \else Author's \fi
                       2257
                       2258
                            \ifnum\num@authorgroups>1\relax
                            addresses: \else address: \fi
                       2259
                            \bgroup
                       2260
                            \def\streetaddress##1{\unskip, ##1}%
                       2261
                       2262
                            \def\postcode##1{\unskip, ##1}%
                            \def\position##1{\unskip\ignorespaces}%
                       2264
                            \def\institution##1{\unskip, ##1}%
                            \def\city##1{\unskip, ##1}%
                       2265
                            \def\state##1{\unskip, ##1}%
                       2266
```

\divide\author@bx@wd by 2\relax

2223

```
\renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
                   2267
                        \def\country##1{\unskip, ##1}%
                   2268
                        \def\and{\unskip; }%
                   2269
                        \def\@author##1{##1}%
                   2270
                        \def\email##1##2{\unskip, \nolinkurl{##2}}%
                   2271
                        \addresses
                        \egroup}
                   2273
                   2274 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@journal
                   2275
                        \ifx\@authorsaddresses\@empty
                        \ClassWarningNoLine{\@classname}{Authors'
                   2276
                   2277
                          addresses are mandatory for ACM journals}%
                   2278
                        \fi\fi\fi\}
                  This is an amsart macro that we do not need.
   \@setaddresses
                   2279 \def\@setaddresses{}
                  Adding a footnote mark to authors. This version adds a "normal" footnote mark.
 \@authornotemark
                   \@@authornotemark   Adding a footnote mark to authors with a given number
                   2281 \def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}
      \@mkteasers Typesetting the teasers
                   2282 \def\@mkteasers{%
                        \ifx\@teaserfigures\@empty\else
                   2283
                   2284
                          \def\@teaser##1{\par\bigskip\bgroup
                            \captionsetup{type=figure}##1\egroup\par}
                   2285
                          \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
                   2286
                            \noindent\@Description@presentfalse
                   2287
                            \@teaserfigures\par\if@Description@present\else
                   2288
                               \global\@undescribed@imagestrue
                   2289
                               \ClassWarning{\@classname}{A possible image without
                   2290
                   2291
                                 description}\fi
                   2292
                          \medskip}%
                   2293
                       \fi}
     \@mkabstract Typesetting the abstract
                   2294 \def\@mkabstract{\bgroup
                        \ifx\@abstract\@lempty\else
                   2295
                        {\phantomsection\addcontentsline{toc}{section}{Abstract}%
                          \if@ACM@journal
                   2297
                             \everypar{\setbox\z@\lastbox\everypar{}}\small
                   2298
                          \else
                   2299
                            \section*{\abstractname}%
                   2300
                   2301
                         \ignorespaces\@abstract\par}%
                   2302
                        \fi\egroup}
```

```
\@mkbibcitation Print the bibcitation format
                       2304 \def\@mkbibcitation{\bgroup
                       2305
                            \let\@vspace\@vspace@orig
                       2306
                            \let\@vspacer\@vspacer@orig
                       2307
                            \def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%
                       2308
                            \def\footnotemark{}%
                       2309
                             \def\\{\unskip{} \ignorespaces}%
                             \def\footnote{\ClassError{\@classname}{Please do not use footnotes
                       2310
                                 inside a \string\title{} or \string\author{} command! Use
                       2311
                                 \string\titlenote{} or \string\authornote{} instead!}}%
                       2312
                       2313
                            \def\@article@string{\ifx\@acmArticle\@empty{\ }\else,
                              Article \@acmArticle \ \fi}%
                       2314
                            \par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak
                       2315
                             \noindent\bgroup
                       2316
                               \def\\{\unskip{}, \ignorespaces}\authors\egroup. \@acmYear. \@title
                       2317
                            \ifx\@subtitle\@empty. \else: \@subtitle. \fi
                       2318
                       2319
                             \if@ACM@nonacm\else
                              % The 'nonacm' option disables 'printacmref' by default,
                       2320
                       2321
                              % and the present \@mkbibcitation definition is never used
                              % in this case. The conditional remains useful if the user
                       2322
                              % explicitly sets \settopmatter{printacmref=true}.
                       2323
                              \if@ACM@journal@bibstrip
                       2324
                                  \textit{\@journalNameShort}
                       2325
                                  \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
                       2326
                                  \ref{TotPages}~\@pages@word.
                       2327
                              \else
                       2328
                                  In \textit{\@acmBooktitle}%
                       2329
                                  \ifx\@acmEditors\@empty\textit{.}\else
                       2330
                                    \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
                       2331
                                  \fi\
                       2332
                       2333
                                  ACM, New York, NY, USA%
                       2334
                                    \@article@string\unskip, \ref{TotPages}~\@pages@word.
                       2335
                              \fi
                            \fi
                       2336
                            \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
                       2338 \par\egroup}
  2339 \def\@printendtopmatter{\bgroup
                       2340 \let\@vspace\@vspace@orig
                       2341
                            \let\@vspacer\@vspacer@orig
                       2342
                            \par\bigskip
                       2343 \egroup}
          \@setthanks We redefine \setthanks using \long
                       2344 \ef\@setthanks{\long\def\thanks#1{\par##1\@addpunct.}\thankses}
\@setauthorsaddresses
                       2345 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}
```

#### 3.16 Headers and Footers

```
We use fancyhdr for our headers and footers:
                                                                                                  2346 \RequirePackage{fancyhdr}
                                                                                                The following code by Ross Moore protects against changes by the totpages package:
\ACM@restore@pagestyle
                                                                                                  2347 \let\ACM@ps@plain\ps@plain
                                                                                                  2348 \let\ACM@ps@myheadings\ps@myheadings
                                                                                                  2349 \let\ACM@ps@headings\ps@headings
                                                                                                  2350 \def\ACM@restore@pagestyle{%
                                                                                                  2351 \let\ps@plain\ACM@ps@plain
                                                                                                  2352 \let\ps@myheadings\ACM@ps@myheadings
                                                                                                  2353 \let\ps@headings\ACM@ps@headings}
                                                                                                  2354 \AtBeginDocument{\ACM@restore@pagestyle}
                    \ACM@linecount@bx
                                                                                                 This is the box displayed in review mode
                                                                                                  2355 \if@ACM@review
                                                                                                  2356 \newsavebox{\ACM@linecount@bx}
                                                                                                                      \newlength\ACM@linecount@bxht
                                                                                                  2358
                                                                                                                       \newcount\ACM@linecount
                                                                                                                        \ACM@linecount\@ne\relax
                                                                                                  2359
                                                                                                                        \def\ACM@mk@linecount{%
                                                                                                  2360
                                                                                                                               2361
                                                                                                                                                \normalsize
                                                                                                  2362
                                                                                                                                                \setlength{\ACM@linecount@bxht}{0pt}%
                                                                                                  2363
                                                                                                                                                \loop{\color{red}\scriptsize\the\ACM@linecount}\
                                                                                                  2364
                                                                                                                                                \global\advance\ACM@linecount by \@ne
                                                                                                  2365
                                                                                                                                                \addtolength{\ACM@linecount@bxht}{\baselineskip}%
                                                                                                  2366
                                                                                                                                                \ifdim\ACM@linecount@bxht<\textheight\repeat
                                                                                                  2367
                                                                                                                                                \label{lem:color} $$ \operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\color}\operatorname{\colo
                                                                                                  2368
                                                                                                                                                \global\advance\ACM@linecount by \@ne}}}
                                                                                                  2369
                                                                                                  2370 \fi
                            \ACM@linecountL How to display the box on the left
                                                                                                  2371 \def\ACM@linecountL{%
                                                                                                  2372 \if@ACM@review
                                                                                                  2373
                                                                                                                       \ACM@mk@linecount
                                                                                                                      \begin{picture}(0,0)%
                                                                                                  2374
                                                                                                                               \put(-26,-22){\usebox{\ACM@linecount@bx}}%
                                                                                                  2375
                                                                                                  2376
                                                                                                                      \end{picture}%
                                                                                                                      \fi}
                                                                                                  2377
                            \ACM@linecountR How to display the box on the right
                                                                                                  2378 \def\ACM@linecountR{%
                                                                                                                     \if@ACM@review
                                                                                                  2379
                                                                                                                     \ACM@mk@linecount
                                                                                                  2380
                                                                                                                      \begin{picture}(0,0)%
                                                                                                  2381
                                                                                                                               \put(20,-22){\usebox{\ACM@linecount@bx}}%
                                                                                                  2382
                                                                                                  2383
                                                                                                                        \end{picture}%
```

2384 \fi}

```
\ACM@timestamp The timestamp system
                    2385 \if@ACM@timestamp
                         % Subtracting 30 from \time gives us the effect of rounding down despite
                          % \numexpr rounding to nearest
                          \newcounter{ACM@time@hours}
                          \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
                          \newcounter{ACM@time@minutes}
                    2390
                    2391 \setcounter{ACM@time@minutes}{\numexpr\time - \theACM@time@hours * 60 \relax}
                          \newcommand\ACM@timestamp{%
                    2392
                            \footnotesize%
                    2393
                            \ifx\@acmSubmissionID\@empty\relax\else
                    2394
                            Submission ID: \@acmSubmissionID.{ }%
                    2395
                    2396
                            \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
                    2397
                            \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
                    2398
                            Page \thepage\ of \@startPage--\pageref*{TotPages}.%
                    2399
                    2400 }
                    2401\fi
   \@shortauthors Even if the author redefined \shortauthors, we do not print it in the headers when in
                    anonymous mode:
                    2402 \ensuremath{\mbox{def}\ensuremath{\mbox{@shortauthors}}\ensuremath{\mbox{%}}
                    2403 \if@ACM@anonymous
                    2404
                            Anon.
                            \ifx\@acmSubmissionID\@empty\else Submission Id: \@acmSubmissionID\fi
                        \else\shortauthors\fi}
   \@headfootfont The font to typeset header and footer text.
                    2407 \def\@headfootfont{\sffamily\footnotesize}
standardpagestyle The page style for all pages but the first one The page style for all pages but the first one
                    2408 \AtBeginDocument{%
                    2409 \fancypagestyle{standardpagestyle}{%
                    2410 \fancyhf{}%
                    2411 \renewcommand{\headrulewidth}{\z@}%
                    2412
                         \renewcommand{\footrulewidth}{\z@}%
                          \def\@acmArticlePage{%
                    2413
                            \ifx\@acmArticle\empty%
                    2414
                              \if@ACM@printfolios\thepage\fi%
                    2415
                    2416
                            \else%
                              \@acmArticle\if@ACM@printfolios:\thepage\fi%
                    2417
                    2418
                    2419
                          }%
                          \if@ACM@journal@bibstrip
                    2420
                            \ifcase\ACM@format@nr
                    2421
                    2422
                            \relax % manuscript
                              \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
                    2423
                              \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
                    2424
                              \fancyhead[RE]{\@shortauthors}%
                    2425
```

```
\fancyhead[LO]{\ACM@linecountL\shorttitle}%
2426
         \if@ACM@nonacm\else%
2427
           \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}
2428
         \fi%
2429
2430
       \or % acmsmall
         \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticlePage}%
2431
2432
         \fancyhead[RO]{\@headfootfont\@acmArticlePage}%
2433
         \fancyhead[RE]{\@headfootfont\@shortauthors}%
         \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2434
         \if@ACM@nonacm\else%
2435
        \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2436
          \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2437
         \fi
2438
2439
       \or % acmlarge
         \fancyhead[LE]{\ACM@linecountL\@headfootfont
2440
         \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2441
         \fancyhead[L0]{\ACM@linecountL}%
2442
         \footnotemark
2443
           \shorttitle\quad\textbullet\quad\@acmArticlePage}%
2444
2445
         \if@ACM@nonacm\else%
        \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2446
          \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2447
         \fi
2448
       \or % acmtog
2449
         \fancyhead[LE]{\ACM@linecountL\@headfootfont
2450
           \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2451
         \fancyhead[LO]{\ACM@linecountL}%
2452
         \fancyhead[RE]{\ACM@linecountR}%
2453
         \fancyhead[RO]{\@headfootfont
2454
           2455
2456
         \if@ACM@nonacm\else%
        \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2457
2458
          \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
         \fi
2459
       \else % Proceedings
2460
         \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2461
         \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2462
         \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2463
         \if@ACM@nonacm\else%
           \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
2465
             \acmConference@shortname,
2466
             \acmConference@date, \acmConference@venue}%
2467
           \footnotemark
2468
             \acmConference@shortname,
2469
             \acmConference@date, \acmConference@venue\ACM@linecountR}%
2470
2471
         \fi
2472
       \fi
2473
     \else % Proceedings
       \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2474
       \fancyhead[L0]{\ACM@linecountL\@headfootfont\shorttitle}%
2475
```

```
\fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
                  2476
                         \if@ACM@nonacm\else%
                  2477
                           \fancyhead[LE]{\ACM@linecountL\@headfootfont
                  2478
                              \acmConference@shortname,
                  2479
                              \verb|\acmConference@date, \verb|\acmConference@venue|| % \\
                  2480
                  2481
                           \footnotemark
                  2482
                              \acmConference@shortname,
                              \acmConference@date, \acmConference@venue\ACM@linecountR}%
                  2483
                         \fi
                  2484
                       \fi
                  2485
                       \if@ACM@sigchiamode
                  2486
                  2487
                          \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
                  2488
                       \if@ACM@timestamp
                  2489
                          \fancyfoot[LO,RE]{\ACM@timestamp}
                  2490
                       \fi
                  2491
                  2492 }%
                  2493 \pagestyle{standardpagestyle}
     \@folio@wd Folio blob width, height, offsets and max number
     \@folio@ht 2495 \newdimen\@folio@wd
\@folio@voffset
                 2496 \@folio@wd=\z@
    \@folio@max 2497 \newdimen\@folio@ht
                  2498 \@folio@ht=\z@
                  2499 \newdimen\@folio@voffset
                  2500 \@folio@voffset=\z@
                  2501 \def\@folio@max{1}
                  2502 \ifcase\ACM@format@nr
                  2503 \relax % manuscript
                  2504 \or % acmsmall
                  2505 \@folio@wd=45.75pt\relax
                       \@folio@ht=1.25in\relax
                  2506
                       \@folio@voffset=.2in\relax
                       \def\@folio@max{8}
                  2509 \or % acmlarge
                  2510 \@folio@wd=43.25pt\relax
                  2511 \@folio@ht=79pt\relax
                  2512 \@folio@voffset=.55in\relax
                  2513 \def\@folio@max{10}
                  2514 \fi
    \@folioblob The macro to typeset the folio blob.
                  2515 \def\@folioblob{\@tempcnta=0\@acmArticleSeq\relax
                  2516 \ifnum\@tempcnta=0\relax\else
                  First, we calculate \@acmArticleSeq modulo \@folio@max
                  2517
                  2518
                          \ifnum\@tempcnta>\@folio@max\relax
                           \advance\@tempcnta by - \@folio@max
                  2519
```

```
\repeat
                2520
                        \advance\@tempcnta by -1\relax
                2521
                        \@tempdima=\@folio@ht\relax
                2522
                        \multiply\@tempdima by \the\@tempcnta\relax
                2523
                        \advance\@tempdima by -\@folio@voffset\relax
                2524
                2525
                        \begin{picture}(0,0)
                        \mbox[\z@]{\raisebox{-}(etempdima){%}}
                2526
                2527
                2528
                              \arrowvert = 0.45\efolio@ht}[\ze][\ze]%
                                \rule{\@folio@wd}{\@folio@ht}}}%
                2529
                            \parbox{\@folio@wd}{%
                2530
                2531
                              \centering
                              \textcolor{white}{\LARGE\sffamily\bfseries\@acmArticle}}}
                2532
                      \end{picture}\fi}
                2533
                2534
firstpagestyle The page style for the first page only.
                2535 \AtBeginDocument{%
                2536 \fancypagestyle{firstpagestyle}{%
                2537
                     \fancyhf{}%
                      \mbox{\ensuremath{\mbox{\headrulewidth}}{\xspace}} \
                2538
                      \renewcommand{\footrulewidth}{\z@}%
                2539
                      \if@ACM@journal@bibstrip
                2540
                        \ifcase\ACM@format@nr
                2541
                        \relax % manuscript
                2542
                          \fancyhead[L]{\ACM@linecountL}%
                2543
                          2544
                          \if@ACM@nonacm\else%
                2545
                            \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
                2546
                2547
                          \fi%
                        \or % acmsmall
                2548
                          \if@ACM@nonacm\else%
                2549
                         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
                2550
                            \@acmNumber, Article \@acmArticle. Publication date:
                2551
                            \@acmPubDate.}%
                2552
                2553
                          \fancyhead[LE]{\ACM@linecountL\@folioblob}%
                2554
                          \fancyhead[L0]{\ACM@linecountL}%
                2555
                          \footnote{Months} \footnote{Months} \
                2556
                          \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
                2557
                        \or % acmlarge
                2558
                          \if@ACM@nonacm\else%
                2559
                2560
                         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
                            \@acmNumber, Article \@acmArticle. Publication date:
                2561
                            \@acmPubDate.}%
                2562
                          \fi%
                2563
                          \fancyhead[RO]{\@folioblob}%
                2564
                          \fancyhead[LE]{\ACM@linecountL\@folioblob}%
                2565
                          \fancyhead[LO]{\ACM@linecountL}%
                2566
```

```
\fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2567
        \or % acmtog
2568
         \if@ACM@nonacm\else%
2569
         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2570
            \@acmNumber, Article \@acmArticle. Publication date:
2571
            \@acmPubDate.}%
2572
          \fi%
2573
          \fancyhead[L]{\ACM@linecountL}%
2574
          \fancyhead[R]{\ACM@linecountR}%
2575
       \else % Conference proceedings
2576
          \fancyhead[L]{\ACM@linecountL}%
2577
          \fancyhead[R]{\ACM@linecountR}%
2578
          \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2579
2580
     \else
2581
       \fancyhead[L]{\ACM@linecountL}%
2582
       \fancyhead[R]{\ACM@linecountR}%
2583
       \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2584
2585
     \if@ACM@timestamp
2586
       \ifnum\ACM@format@nr=0\relax % Manuscript
2587
       \fancyfoot[LO,RE]{\ACM@timestamp\quad
2588
          \if@ACM@nonacm\else
2589
            \footnotesize Manuscript submitted to ACM
2590
          \fi}
2591
       \else
2592
       \fancyfoot[LO,RE]{\ACM@timestamp}
2593
2594
     \fi
2595
2596 }}
```

### 3.17 Sectioning

\ACM@NRadjust Ross Moore's macro.

Initially \ACM@sect@format@ just passes through its #1 argument unchanged. When a sectioning macro such as \section occurs, the \ACM@NRadjust redefines \ACM@sect@format@ to expand into the styling commands; e.g., \@secfont. Then \Sectionformat is temporarily redefined to produce \realSectionformat{\ACM@sect@format{#1}}{#2}, which ultimately becomes \Sectionformat{\@secfont{#1}}{#2}. This is done to allow \Sectionformat to be variable, as may be needed in particular circumstances. Its current expansion is saved as \realSectionformat which is used with the modified 1st argument, then \Sectionformat is reverted to its former expansion.

To style the section-number, the line #1{} is used at the end of \ACM@NRadjust. This imposes style-changing commands for fonts and sizes, but any \MakeUppercase acts on just the {}. It's a bit hacky, by essentially assuming that only numbers occur here, not letters to be case-changed. (This should be acceptable in a class-file, as it ought to be possible to change the case elsewhere, if that

was ever desired.) Also, it can result in \@adddotafter being called too soon, so a slight adjustment is made, via \ACM@adddotafter, which now tests whether its argument is empty. But the coding has to allow for other packages to have also patched \@adddotafter.

```
2597 \def\ACM@NRadjust#1{%
2598 \begingroup
     \expandafter\ifx\csname Sectionformat\endcsname\relax
     % do nothing when \Sectionformat is unknown
2600
      \def\next{\endgroup #1}%
2601
2602 \else
     \def\next{\endgroup
2603
      \let\realSectionformat\Sectionformat
      \def\ACM@sect@format@{#1}%
2605
      \let\Sectionformat\ACM@NR@adjustedSectionformat
2606
2607 %% next lines added 2018-06-17 to ensure section number is styled
     \let\real@adddotafter\@adddotafter
2608
      \let\@adddotafter\ACM@adddotafter
2609
     #1{}% imposes the styles, but nullifies \MakeUppercase
2610
2611
     \let\@adddotafter\real@adddotafter
2612 }%
2613 \fi \next
2614 }
2615 \def\ACM@NR@adjustedSectionformat#1#2{%
2616 \realSectionformat{\ACM@sect@format{#1}}{#2}%
2617 \let\Sectionformat\realSectionformat}
2618 \DeclareRobustCommand{\ACM@sect@format}{\ACM@sect@format@}
2619 \def\ACM@sect@format@null#1{#1}
2620 \let\ACM@sect@format@\ACM@sect@format@null
2621 \AtBeginDocument{%
2622 \expandafter\ifx\csname LTX@adddotafter\endcsname\relax
2623 \let\LTX@adddotafter\@adddotafter
2624 \fi
2625 }
2626 \ def\ ACM@ add dot after \#1 \{ ifx relax \#1 relax else \ LTX @ add dot after \#1 \} fi \}
   Sectioning is different for different levels
2627 \renewcommand\section{\@startsection{section}{1}{\z@}%
2628 {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2629 {.25\baselineskip}%
2630 {\ACM@NRadjust\@secfont}}
2631 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2632 {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
    {.25\baselineskip}%
2633
2634 {\ACM@NRadjust\@subsecfont}}
```

\ACM@NR@adjustedSectionformat

\ACM@adddotafter

```
2635 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
                                                                          {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
                                                             2636
                                                                          \{-3.5\p@\}\%
                                                             2637
                                                             2638 {\ACM@NRadjust{\@subsubsecfont\@adddotafter}}}
                                                             2639 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
                                                             2640 {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
                                                             2641 {-3.5\p@}%
                                                             2642 {\ACM@NRadjust{\@parfont\@adddotafter}}}
                                                             2643 \renewcommand\part{\@startsection{part}{9}{\z@}%
                                                             2644 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
                                                             2645 {4\p@}%
                                                                          {\ACM@NRadjust\@parfont}}
2647 \def\section@raggedright{\@rightskip\@flushglue
                                                             2648 \rightskip\@rightskip
                                                             2649 \leftskip\z@skip
                                                             2650 \parindent\z@}
                               \@secfont Fonts for sections etc. are different for different formats.
                      \verb|\descfont| 2651 \verb|\def| @ secfont{\sffamily bfseries \section@ ragged right \verb|\def| & section@ ragged right \| & section
             \verb|\ensuremath{\color=0}| \ensuremath{\color=0}| \ensuremath{\color
                               \@parfont 2653 \def\@subsubsecfont{\sffamily\itshape}
                                                             2654 \def\@parfont{\itshape}
                                                             2655 \setcounter{secnumdepth}{3}
                                                             2656 \ifcase\ACM@format@nr
                                                             2657 \relax % manuscript
                                                             2658 \or % acmsmall
                                                             2659 \or % acmlarge
                                                             2660 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
                                                             2661 \def\@subsecfont{\sffamily\large\section@raggedright}
                                                             2662 \or % acmtog
                                                             2663 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
                                                             2664 \def\@subsecfont{\sffamily\large\section@raggedright}
                                                             2665 \or % sigconf
                                                             2666 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
                                                             2667 \def\@subsecfont{\bfseries\Large\section@raggedright}
                                                             2668 \or % siggraph
                                                             2669 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
                                                             2670 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}
                                                             2671 \or % sigplan
                                                             2672 \def\@secfont{\bfseries\Large\section@raggedright}
                                                             2673 \def\@subsecfont{\bfseries\section@raggedright}
                                                             2674 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
                                                                              \{-.75\baselineskip \eqrup -2\p@ \eqrup -.2\p@}%
                                                             2675
                                                                               {.25\baselineskip}%
                                                             2676
                                                                               {\@subsubsecfont}}
                                                             2677
                                                             2678 \def\@subsubsecfont{\bfseries\section@raggedright}
                                                             {-.5\baselineskip \eqnus -2\p@ \eqnus -.2\p@}%
```

```
\{-3.5\p@\}\%
                2681
                      {\@parfont\@addspaceafter}}
                2682
                2683 \def\@parfont{\bfseries\itshape}
                {-.5\baselineskip \eqnus -2\p@ \eqnus -.2\p@}%
                2685
                      \{-3.5\p@\}\%
                      {\@subparfont\@addspaceafter}}
                2687
                2688 \def\@subparfont{\itshape}
                2689 \or % sigchi
                2690 \setcounter{secnumdepth}{1}
                2691 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
                2692 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
                2693 \or % sigchi-a
                2694 \setcounter{secnumdepth}{0}
                2695 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
                2696 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
 \@adddotafter Add punctuation after a sectioning command
                2698 \def\@adddotafter#1{#1\@addpunct{.}}
\@addspaceafter Add space after a sectioning command
                2699 \def\@addspaceafter#1{#1\@addpunct{\enspace}}
```

## 3.18 TOC lists

\@dotsep

Related to the \tableofcontents are all the horizontal fillers. Base LTEX defines \@dottedtocline, which we should not disable. Yet, this command expects \@dotsep to be defined but leaves this to the class implementation. Since amsart does not provide this, we copy the standard variant from article here.

2700 \providecommand\*\@dotsep{4.5}

### 3.19 Theorems

\@acmplainbodyfont The font to typeset the body of the acmplain theorem style.

2701 \def\@acmplainbodyfont{\itshape}

\@acmplainindent The amount to indent the acmplain theorem style.

2702 \def\@acmplainindent{\parindent}

\@acmplainheadfont The font to typeset the head of the acmplain theorem style.

2703 \def\@acmplainheadfont{\scshape}

\@acmplainnotefont The font to typeset the note of the acmplain theorem style.

2704 \def\@acmplainnotefont{\@empty}

```
Customization of the acmplain theorem style:
                          2705 \ifcase\ACM@format@nr
                          2706 \relax % manuscript
                          2707 \or % acmsmall
                          2708 \or % acmlarge
                          2709 \or % acmtog
                          2710 \or % sigconf
                          2711 \or % siggraph
                          2712 \or % sigplan
                          2713 \def\@acmplainbodyfont{\itshape}
                          2714 \def\@acmplainindent{\z@}
                          2715 \def\@acmplainheadfont{\bfseries}
                          2716 \def\@acmplainnotefont{\normalfont}
                          2717 \or % sigchi
                          2718 \or % sigchi-a
                          2719 \fi
               acmplain The acmplain theorem style
                          2720 \newtheoremstyle{acmplain}%
                          2721 {.5\baselineskip\@plus.2\baselineskip
                          2722
                                 \@minus.2\baselineskip}% space above
                          2723 {.5\baselineskip\@plus.2\baselineskip
                          2724
                                 \@minus.2\baselineskip}% space below
                          2725 {\@acmplainbodyfont}% body font
                          2726 {\@acmplainindent}% indent amount
                          2727 {\@acmplainheadfont}% head font
                          2728 {.}% punctuation after head
                          2729 {.5em}% spacing after head
                          2730 {\thmname{#1}\thmnumber{ #2}\thmnote{ (\@acmplainnotefont(#3)}}}% head spec
\@acmdefinitionbodyfont The font to typeset the body of the acmdefinition theorem style.
                          2731 \def\@acmdefinitionbodyfont{\normalfont}
  \@acmdefinitionindent The amount to indent the acmdefinition theorem style.
                          2732 \def\@acmdefinitionindent{\parindent}
\@acmdefinitionheadfont The font to typeset the head of the acmdefinition theorem style.
                          2733 \def\@acmdefinitionheadfont{\itshape}
                         The font to typeset the note of the acmdefinition theorem style.
\@acmdefinitionnotefont
                          2734 \def\@acmdefinitionnotefont{\@empty}
                             Customization of the acmdefinition theorem style:
                          2735 \ifcase\ACM@format@nr
                          2736 \relax % manuscript
                          2737 \or % acmsmall
                          2738 \or % acmlarge
                          2739 \or % acmtog
                          2740 \or % sigconf
```

```
2741 \or % siggraph
             2742 \or % sigplan
                  \def\@acmdefinitionbodyfont{\normalfont}
                  \def\@acmdefinitionindent{\z@}
             2744
                  \def\@acmdefinitionheadfont{\bfseries}
             2745
                 \def\@acmdefinitionnotefont{\normalfont}
             2747 \or % sigchi
             2748 \or % sigchi-a
             2749 \fi
acmdefinition
             The acmdefinition theorem style
             2750 \newtheoremstyle{acmdefinition}%
                 {.5\baselineskip\@plus.2\baselineskip
                    \@minus.2\baselineskip}% space above
             2753
                  {.5\baselineskip\@plus.2\baselineskip
                    \@minus.2\baselineskip}% space below
             2754
                  {\@acmdefinitionbodyfont}% body font
             2755
                  {\@acmdefinitionindent}% indent amount
             2756
                  {\@acmdefinitionheadfont}% head font
             2757
                  {.}% punctuation after head
                  {.5em}% spacing after head
```

Make acmplain the default theorem style.

```
2761 \theoremstyle{acmplain}
```

Delay defining the theorem environments until after other packages have been loaded. In particular, the cleveref package must be loaded before the theorem environments are defined in order to show the correct environment name (see <a href="https://github.com/borisveytsman/acmart/issues/138">https://github.com/borisveytsman/acmart/issues/138</a>). The acmthm option is used to suppress the definition of any theorem environments. Also, to avoid obscure errors arising from these environment definitions conflicting with environments defined by the user or by user-loaded packages, we only define environments that have not yet been defined.

```
2762 \AtEndPreamble{%
     \if@ACM@acmthm
2763
     \theoremstyle{acmplain}
2764
     \@ifundefined{theorem}{%
2765
     \newtheorem{theorem}{Theorem}[section]
2766
2767
     \@ifundefined{conjecture}{%
     \newtheorem{conjecture}[theorem]{Conjecture}
2770
     \@ifundefined{proposition}{%
2771
     \newtheorem{proposition}[theorem]{Proposition}
2772
2773
     \@ifundefined{lemma}{%
2774
     \verb|\newtheorem{lemma}[theorem]{Lemma}|
2776
```

```
\@ifundefined{corollary}{%
                 2777
                       \newtheorem{corollary}[theorem]{Corollary}
                 2778
                 2779
                       }{}
                       \theoremstyle{acmdefinition}
                 2780
                       \@ifundefined{example}{%
                       \newtheorem{example}[theorem]{Example}
                 2783
                       }{}
                       \@ifundefined{definition}{%
                 2784
                       \newtheorem{definition}[theorem]{Definition}
                 2785
                 2786
                       }{}
                       \fi
                 2787
                       \theoremstyle{acmplain}
                 2788
                 2789 }
\@proofnamefont The font to typeset the proof name.
                 2790 \def\@proofnamefont{\scshape}
 \@proofindent Whether or not to indent proofs.
                 2791 \def\@proofindent{\indent}
                     Customization of the proof environment.
                 2792 \ifcase\ACM@format@nr
                 2793 \relax % manuscript
                 2794 \or % acmsmall
                 2795 \or % acmlarge
                 2796 \or % acmtog
                 2797 \or % sigconf
                 2798 \or % siggraph
                 2799 \or % sigplan
                 2800 \def\@proofnamefont{\itshape}
                 2801 \def\@proofindent{\noindent}
                 2802 \or % sigchi
                 2803 \or % sigchi-a
                 2804\fi
          proof We want some customization of the proof environment.
                 2805 \renewenvironment{proof}[1][\proofname]{\par
                 2806 \pushQED{\qed}%
                       \normalfont \topsep6\p@\@plus6\p@\relax
                 2807
                 2808
                       \trivlist
                 2809
                       \item[\@proofindent\hskip\labelsep
                             {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
                 2810
                 2811 }{%
                 2812 \popQED\endtrivlist\@endpefalse
                 2813 }
```

# 3.20 Balancing columns

We need balancing only if the user did not disable it, and we use a two column format

```
2820
                          \global\@ACM@balancefalse
              2821
                        \or % acmlarge
                          \global\@ACM@balancefalse
              2822
                        \or % acmtog
              2823
                           \RequirePackage{balance}%
              2824
              2825
                        \or % sigconf
                           \RequirePackage{balance}%
              2826
                        \or % siggraph
              2827
                           \RequirePackage{balance}%
              2828
                        \or % sigplan
              2829
                           \RequirePackage{balance}%
              2830
                        \or % sigchi
              2831
              2832
                           \RequirePackage{balance}%
              2833
                        \or % sigchi-a
                           \global\@ACM@balancefalse
              2834
                     \fi
              2835
              2836 \fi
              2837 }
              2838 \AtEndDocument{%
              2839 \if@ACM@balance
                   \if@twocolumn
              2840
                   \balance
              2841
              2842 \fi\fi}
              3.21 Acknowledgments
    \acksname
              2843 \newcommand\acksname{Acknowledgments}
              This is a comment-like structure
       \acks
              2844 \specialcomment{acks}{%
              2845 \begingroup
                  \section*{\acksname}
              2847 \phantomsection\addcontentsline{toc}{section}{\acksname}
              2848 }{%
              2849 \endgroup
              2850 }
\grantsponsor
              We just typeset the name of the sponsor
              2851 \def\grantsponsor#1#2#3{#2}
    \grantnum
              2852 \newcommand\grantnum[3][]{#3%
```

2814 \AtEndPreamble{% 2815 \if@ACM@balance

2816

2817

2818 2819 \ifcase\ACM@format@nr

\global\@ACM@balancefalse

\relax % manuscript

\or % acmsmall

# 3.22 Conditional typesetting

We use the comment package for conditional typesetting:

```
2854 \AtEndPreamble{%
2855 \if@ACM@screen
2856 \includecomment{screenonly}
2857 \excludecomment{printonly}
2858 \else
2859 \excludecomment{screenonly}
2860 \includecomment{printonly}
2861 \fi
2862 \if@ACM@anonymous
2863 \excludecomment{anonsuppress}
2864 \excludecomment{acks}
2865 \else
2866 \includecomment{anonsuppress}
2867 \fi}
```

## 3.23 Additional bibliography commands

\showeprint

The command \showeprint has two arguments: the (optional) prefix and the eprint number. Right now the only prefix we understand is the (lowercase) word 'arxiv' (see http://arxiv.org/hypertex/bibstyles/).

```
2868 \newcommand\showeprint[2][arxiv]{%
2869 \def\@tempa{#1}%
2870 \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2871 \def\@tempb{arxiv}%
2872 \ifx\@tempa\@tempb
2873 arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2874 \fi}
```

#### 3.24 End of Class

```
\vspace We do not disable \vspace, but add warning to it
```

```
2875 \let\@vspace@orig=\@vspace
2876 \let\@vspacer@orig=\@vspacer
2877 \apptocmd{\@vspace}{\ClassWarning{\@classname}{\string\vspace\space should
2878 only be used to provide space above/below surrounding
2879 objects}}{}{}
2880 \apptocmd{\@vspacer}{\ClassWarning{\@classname}{\string\vspace\space should
2881 only be used to provide space above/below surrounding
2882 objects}}{}{}
```

\ACM@origbaselinestretch

We produce an error if the user tries to change \baselinestretch

```
2883 \let\ACM@origbaselinestretch\baselinestretch
2884 \AtEndDocument{\ifx\baselinestretch\ACM@origbaselinestretch\else
2885 \ClassError{\@classname}{An attempt to redefine
2886 \string\baselinestretch\space detected. Please do not do this for
2887 ACM submissions!}\fi}
```

2888 \normalsize\normalfont\frenchspacing 2889  $\langle /class \rangle$ 

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