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#### Abstract

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

## **Contents**

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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.

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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 [?] or the documentation for your TEX system).
- 3. Update the database of file names. Again, see [?] 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 ?? and ?? 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 ??. 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 ??. 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 ??) 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  $BibT_EX$  style is based on natbib. In most cases you do not need to set it. See Section ??.

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 ??)
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 ??)
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 ??
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 [?].

\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 ??. 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 LATEX \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{...}
\email{...}
```

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{...}
\author{...}
\atherightarrow
\affiliation{...}
\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 LTEX), 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 ??).

\authorsaddresses

In some formats, addresses are printed as a footnote on the first page. By default Large 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 footnote connected to several authors. The command  $\authornotemark[\langle number \rangle]$  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}
```

\acmDOI T

Setting it to the empty string, as  $\acmISBN{}$ , suppresses printing the ISBN. The macro  $\acmDOI{}(DOI)$  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_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 ??. 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 LTEX. 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 "traditional" 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  $\operatorname{settopmatter}(\operatorname{settings})$ . The settings and their meanings are listed in Table ??. 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  $\ensuremath{\mbox{received[}\langle stage\rangle]} {\langle date\rangle}$  sets the history of the publication. The  $[\langle stage\rangle]$  argument is optional; the default is Received for the first date and revised for the subsequent ones. For example,

```
\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 [?, ?, ?], 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 [?] 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 [?]. The simplest one is to use a \minipage environment:

```
\begin{table}
\caption{Simulation Configuration}
\label{tab:conf}
\begin{minipage}{\columnwidth}
\begin{center}
\begin{array}{ll} \begin{array}{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[\(\langle\) short \(description\rangle\)] \{\(long\) \description\rangle\} 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 ??) 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,
        = {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,
 author =
               "Barack Obama",
 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. <a href="https://www.ifla.org/files/assets/cataloguing/pubs/names-of-persons\_1996.pdf">https://www.ifla.org/files/assets/cataloguing/pubs/names-of-persons\_1996.pdf</a>) 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 [?]: 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:

- 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 [?] is recommended for complex figures with several subplots or subfigures that require separate subcaptioning. The packages nomencl [?] and glossaries [?] 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 [?], 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 <a href="http://tex.stackexchange.com/questions/35">http://tex.stackexchange.com/questions/35</a>

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
JETC	ACM Journal on Emerging Technologies in Computing Systems

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

Abbreviation	Publication
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
TOPC	ACM Transactions on Parallel Computing

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

Abbreviation	Publication
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 ??, 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[2020/01/11 v1.67 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 \langle /gobble \rangle
23 (*class)
24 \def\@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\ACM@format@nr]{%
                          manuscript, acmsmall, acmlarge, acmtog, sigconf, siggraph,
                              sigplan, \ sigchi-a\}[manuscript]\{\}\{\%
                              \ClassError{\@classname}{The option format must be manuscript,
                                acmsmall, acmlarge, acmtog, sigconf, siggraph,
                          36
                                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
                                \PackageInfo{\@classname}{Using screen mode}%
                          50
                             \else
                          51
                          52
                                \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
                          57 \if@ACM@urlbreakonhyphens
                          58
                                \PackageInfo{\@classname}{Using breaking urls on hyphens}%
                          59
                                \PackageInfo{\@classname}{Not breaking urls on hyphens}%
                          61 \fi}{\PackageError{\@classname}{The option urlbreakonhyphens can be either true or
                                false}}
                          62
                          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
                              \fi}{\PackageError{\@classname}{The option acmthm can be either true or
                          69
                                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}%
                          74
                          75
                                \AtBeginDocument{\@ACM@printfoliostrue}%
                          76
                                \PackageInfo{\@classname}{Not using review mode}%
                          77
                            \fi}{\PackageError{\@classname}{The option review can be either true or
                          78
                                false}}
                          79
                          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}%
                          83
                             \else
                          84
                                \PackageInfo{\@classname}{Not using authorversion mode}%
                          85
                          %6 \fi}{\PackageError{\@classname}{The option authorversion can be either true or
                          88 \ExecuteOptionsX{authorversion=false}
                         Special option for non-ACM publications using the ACM typesetting options.
         \if@ACM@nonacm
                          89 \define@boolkey+{acmart.cls}[@ACM@]{nonacm}[true]{%
                             \if@ACM@nonacm
                                \PackageInfo{\@classname}{Using nonacm mode}%
                          91
                                \AtBeginDocument{\@ACM@printacmreffalse}%
                          92
                                % in 'nonacm' mode we disable the "ACM Reference Format"
                          93
                                % printing by default, but this can be re-enabled by the
                                % user using \settopmatter{printacmref=true}
                          96
                                \PackageInfo{\@classname}{Not using nonacm mode}%
                          97
                             \fi}{\PackageError{\@classname}{The option nonacm can be either true or
                          99
                                false}}
                         100 \ExecuteOptionsX{nonacm=false}
        \if@ACM@balance Whether to balance the last page
                         101 \define@boolkey+{acmart.cls}[@ACM@]{balance}[true]{}{%
                             \PackageError{\@classname}{The option balance can be either true or
                                false}}
                         104 \ExecuteOptionsX{balance}
\if@ACM@natbib@override This macro is no longer used.
         \if@ACM@natbib Whether we use natbib mode
                         105 \define@boolkey+{acmart.cls}[@ACM@]{natbib}[true]{%
                         106 \if@ACM@natbib
                                \PackageInfo{\@classname}{Explicitly selecting natbib mode}%
                         107
                         108
                                \PackageInfo{\@classname}{Explicitly deselecting natbib mode}%
                         109
```

```
\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]{%
                         \if@ACM@anonymous
                            \PackageInfo{\@classname}{Using anonymous mode}%
                     115
                     116
                            \PackageInfo{\@classname}{Not using anonymous mode}%
                     117
                         \fi}{\PackageError{\@classname}{The option anonymous can be either true or
                     118
                            false}}
                     119
                     120 \ExecuteOptionsX{anonymous=false}
 \if@ACM@timestamp Whether we use timestamp mode
                     121 \define@boolkey+{acmart.cls}[@ACM@]{timestamp}[true]{%
                         \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}
\if@ACM@authordraft Whether we use author-draft mode
                     129 \define@boolkey+{acmart.cls}[@ACM@]{authordraft}[true]{%
                         \if@ACM@authordraft
                     130
                            \PackageInfo{\@classname}{Using authordraft mode}%
                     131
                     132
                            \@ACM@timestamptrue
                     133
                            \@ACM@reviewtrue
                            \PackageInfo{\@classname}{Not using authordraft mode}%
                     135
                         fi}{\PackageError(\Classname)}{The option authordraft can be either true or
                     136
                     137
                     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

\if@ACM@journal@bibstrip

Sometimes ACM wants a journal-like publication to have conference information in the bibstrip and vice versa, so we have an additional switch.

150 \newif\if@ACM@journal@bibstrip

\if@ACM@sigchiamode

The formatting of SIGCHI extended abstracts is quite unusual. We have a special switch for them.

151 \newif\if@ACM@sigchiamode

#### Setting up switches

\@ACM@journalfalse
\@ACM@sigchiamodetrue

183 \fi

```
152 \ifnum\ACM@format@nr=5\relax % siggraph
    \ClassWarning{\@classname}{The format siggraph is now obsolete.
      I am switching to sigconf.}
    \setkeys{acmart.cls}{format=sigconf}
157 \ifnum\ACM@format@nr=0\relax
158 \@ACM@manuscripttrue
159 \else
    \@ACM@manuscriptfalse
160
161 \fi
162 \@ACM@sigchiamodefalse
163 \ifcase\ACM@format@nr
164 \relax % manuscript
165 \@ACM@journaltrue
166 \or % acmsmall
    \@ACM@journaltrue
168 \or % acmlarge
    \@ACM@journaltrue
170 \or % acmtog
    \@ACM@journaltrue
172 \or % sigconf
173 \@ACM@journalfalse
174 \or % siggraph
175 \@ACM@journalfalse
176 \or % sigplan
    \@ACM@journalfalse
177
178 \or % sigchi
    \@ACM@journalfalse
179
180∖or % sigchi-a
```

```
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
    \ifcase\ACM@format@nr
190
191
    \relax % manuscript
       \def\ACM@fontsize{9pt}%
193
     \or % acmsmall
       \def\ACM@fontsize{10pt}%
194
    \or % acmlarge
195
       \def\ACM@fontsize{10pt}%
196
197
    \or % acmtog
      \def\ACM@fontsize{9pt}%
    \or % sigconf
199
      \def\ACM@fontsize{9pt}%
200
    \or % siggraph
201
      \def\ACM@fontsize{9pt}%
202
203
      \or % sigplan
204
      \def\ACM@fontsize{10pt}%
      \or % sigchi
       \def\ACM@fontsize{10pt}%
206
    \or % sigchi-a
207
      \def\ACM@fontsize{10pt}%
208
   \fi
209
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\@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
     253
      \let\bibstyle=\@gobble\fi
254
     255
256
       \let\bibstyle=\@citestyle\fi
257
     \def\@tempb{sort}\ifx\@tempa\@tempb
       \def\NAT@sort{\@ne}\fi
258
     \def\@tempb{nosort}\ifx\@tempa\@tempb
259
```

```
\def\@tempb{compress}\ifx\@tempa\@tempb
                                                         261
                                                                           \def\NAT@cmprs{\@ne}\fi
                                                         262
                                                                      \def\@tempb{nocompress}\ifx\@tempa\@tempb
                                                         263
                                                                           \def\NAT@cmprs{\z@}\fi
                                                         264
                                                                      265
                                                                           \def\NAT@sort{\@ne}\def\NAT@cmprs{\@ne}\fi
                                                         266
                                                                      \def\@tempb{mcite}\ifx\@tempa\@tempb
                                                         267
                                                                           \let\NAT@merge\@ne\fi
                                                         268
                                                                      \def\@tempb{merge}\ifx\@tempa\@tempb
                                                         269
                                                                           \@ifnum{\NAT@merge<\tw@}{\let\NAT@merge\tw@}{}\fi
                                                         270
                                                          271
                                                                      \def\@tempb{elide}\ifx\@tempa\@tempb
                                                                           \ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\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
                                                         272
                                                                      \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
                                                         278
                                                                      \if\@tempc\relax\else
                                                         279
                                                                           \expandafter\NAT@rem@eq\@tempc
                                                                           \def\@tempb{open}\ifx\@tempa\@tempb
                                                         280
                                                                             \xdef\NAT@open{\@tempc}\fi
                                                         281
                                                                           \def\@tempb{close}\ifx\@tempa\@tempb
                                                         282
                                                                             \xdef\NAT@close{\@tempc}\fi
                                                         283
                                                                           \def\@tempb{aysep}\ifx\@tempa\@tempb
                                                          284
                                                                             \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%
                                                          298
                                                          299
                                                          300
                                                                         \@latex@error{Undefined '#1' citestyle}%
                                                                        \fi
                                                         301
                                                                  }%
                                                         302
                                                         303∖fi
                                                         The default author-year format:
\bibstyle@acmauthoryear
                                                          304 \newcommand{\bibstyle@acmauthoryear}{%
                                                                   \setcitestyle{%
                                                         305
                                                         306
                                                                        authoryear,%
                                                                        open={[},close={]},citesep={;},%
```

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

```
aysep={},yysep={,},%
                       308
                              notesep={, }}}
                       309
\bibstyle@acmnumeric
                       The default numeric format:
                       310 \newcommand{\bibstyle@acmnumeric}{%
                           \setcitestyle{%
                       311
                              numbers, sort&compress,%
                       312
                       313
                              open={[},close={]},citesep={,},%
                              notesep={, }}}
                       314
                           The default is numeric:
                       315 \if@ACM@natbib
                       316 \citestyle{acmnumeric}
                       317 \fi
```

\@startsection Before we call hyperref, we redefine \startsection commands to their LATX 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
319
     \par
320
     \@tempskipa #4\relax
321
     \@afterindenttrue
322
     \ifdim \ensuremath{\mbox{\tt 0}}\ensuremath{\mbox{\tt dempskipa}} <\ensuremath{\mbox{\tt 2}}\ensuremath{\mbox{\tt 0}}
323
        \@tempskipa -\@tempskipa \@afterindentfalse
324
325
     \if@nobreak
326
        \everypar{}%
327
328
        \addpenalty\@secpenalty\addvspace\@tempskipa
329
     \fi
330
331
      \@ifstar
        {\@ssect{#3}{#4}{#5}{#6}}%
332
        {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}}
333
334 \def\@sect#1#2#3#4#5#6[#7]#8{%
     \edse{\colored} $$\edse{\colored} $$\edse{\colored} $$ \edse{\colored} $$\edse{\colored} $$
335
     \ifnum #2>\c@secnumdepth
336
        \let\@svsec\@empty
337
     \else
338
        \refstepcounter{#1}%
339
        \protected@edef\@svsec{\@seccntformat{#1}\relax}%
340
     \fi
341
      \@tempskipa #5\relax
342
      \ifdim \@tempskipa>\z@
343
        \begingroup
344
          #6{%
345
             \@hangfrom{\hskip #3\relax\@svsec}%
346
                \interlinepenalty \@M #8\@@par}%
347
        \endgroup
348
```

```
\csname #1mark\endcsname{#7}%
349
       \ifnum #2>\c@secnumdepth \else
350
           \verb|\dochangmeasure{\csname the #1\endcsname}||%
351
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\ensuremath{\sc 0}
359
         #6{\hskip #3\relax
360
         \@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
367
           \protect\numberline{\csname the#1\endcsname}%
368
369
           #7}}%
370
    \fi
371
    \@xsect{#5}}
372
373 \def\@xsect#1{%
374
     \@tempskipa #1\relax
     \ifdim \@tempskipa>\z@
375
       \par \nobreak
376
       \vskip \@tempskipa
377
       \@afterheading
378
    \else
379
380
       \@nobreakfalse
381
       \global\@noskipsectrue
       \everypar{%
382
         \if@noskipsec
383
           \global\@noskipsecfalse
384
          {\sc}^{\sc}
385
           \clubpenalty\@M
386
           \begingroup \@svsechd \endgroup
           \unskip
388
389
           \@tempskipa #1\relax
           \hskip -\@tempskipa
390
         \else
391
           \clubpenalty \@clubpenalty
392
393
           \everypar{}%
394
         \fi}%
395
    \fi
396
    \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
                                                                        \interlinepenalty \@M \#5\@@par}%
                                           404
                                                          \endgroup
                                          405
                                                     \else
                                          406
                                                          \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
                                                     \label{linespacing} $$ \operatorname{section}\em \z @{\linespacing} % $$ $$ \em \section \sect
                                          413
                                          414
                                                          {.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 \left(1\right)_{0}
       \l@subsection The spacing in amsart is too large
                                           424 \def\l@subsection{\@tocline{2}{0pt}{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{%
                                          431
                                                                 \csname p@footnote\endcsname\@thefnmark
                                          432
```

```
}%
                  433
                        \color@begingroup
                  434
                          \@makefntext{%
                  435
                            436
                        \color@endgroup}}%
                  437
                  438∖fi
\@mpfootnotetext We want the footnotes in minipages centered:
                  439 \long\def\@mpfootnotetext#1{%
                      \global\setbox\@mpfootins\vbox{%
                 440
                        \unvbox\@mpfootins
                  441
                        \reset@font\footnotesize
                  442
                        \hsize\columnwidth
                  443
                        \@parboxrestore
                  444
                  445
                        \protected@edef\@currentlabel
                             {\csname p@mpfootnote\endcsname\@thefnmark}%
                  446
                        \color@begingroup\centering
                  447
                          \@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{%
                     \def\addtocounter#1#2{}%
                     \def\unskip{}%
                      \def\textbullet{- }%
                  458
                      \def\textrightarrow{ -> }%
                 459
                     \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
                         \def\do@url@hyp{\do\-}%
                   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}
                   488
                       \hypersetup{pdflang={en},
                   489
                         pdfdisplaydoctitle}}
                   490
                      Bibliography mangling.
                   491 \if@ACM@natbib
                       \let\citeN\cite
                   492
                       \let\cite\citep
                   493
                       \let\citeANP\citeauthor
                       \let\citeNN\citeyearpar
                   495
                       \let\citeyearNP\citeyear
                   496
                       \let\citeNP\citealt
                   497
                       \DeclareRobustCommand\citeA
                   498
                          {\begingroup\NAT@swafalse
                   499
                            500
                       \providecommand\newblock{}%
                   501
                   502 \else
                       \AtBeginDocument{%
                   503
                         \let\shortcite\cite%
                   504
                         \providecommand\citename[1]{#1}}
                   505
                   506 \fi
                   507 \newcommand\shortcite[2][]{%
                       \bibliographystyle
                   The amsart package redefines \bibliographystyle since it prefers the AMS bibliogra-
                   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
                   515
                          \fi}}
                      Graphics and color.
                   516 \RequirePackage{graphicx}
                   517 \RequirePackage[prologue]{xcolor}
```

476 \AtEndPreamble{%

```
We define ACM colors according to [?]:
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}
527
    \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#is

```
534 \RequirePackage{geometry}
535 \ifcase\ACM@format@nr
536 \relax % manuscript
      \geometry{letterpaper,head=13pt,
537
      marginparwidth=6pc, heightrounded}%
538
539 \or % acmsmall
      \geometry{twoside=true,
540
        includeheadfoot, head=13pt, foot=2pc,
541
        paperwidth=6.75in, paperheight=10in,
542
543
        top=58pt, bottom=44pt, inner=46pt, outer=46pt,
        marginparwidth=2pc,heightrounded
544
      }%
545
546 \or % acmlarge
      \geometry{twoside=true, head=13pt, foot=2pc,
547
548
        paperwidth=8.5in, paperheight=11in,
549
        includeheadfoot,
        top=78pt, bottom=114pt, inner=81pt, outer=81pt,
550
        marginparwidth=4pc, heightrounded
551
        }%
552
553 \or % acmtog
      \geometry{twoside=true, head=13pt, foot=2pc,
554
555
        paperwidth=8.5in, paperheight=11in,
        includeheadfoot, columnsep=24pt,
556
        top=52pt, bottom=75pt, inner=52pt, outer=52pt,
557
        marginparwidth=2pc,heightrounded
558
```

```
560 \or % sigconf
                  \geometry{twoside=true, head=13pt,
            561
                    paperwidth=8.5in, paperheight=11in,
            562
                    includeheadfoot, columnsep=2pc,
            563
                    top=57pt, bottom=73pt, inner=54pt, outer=54pt,
            564
                    marginparwidth=2pc, heightrounded
            565
                    }%
            566
            567 \or % siggraph
                  \geometry{twoside=true, head=13pt,
            568
                    paperwidth=8.5in, paperheight=11in,
            569
                    includeheadfoot, columnsep=2pc,
                    top=57pt, bottom=73pt, inner=54pt, outer=54pt,
                    marginparwidth=2pc,heightrounded
            572
                    }%
            573
            574 \or % sigplan
                  \geometry{twoside=true, head=13pt,
            575
                    paperwidth=8.5in, paperheight=11in,
            576
            577
                    includeheadfoot=false, columnsep=2pc,
            578
                    top=1in, bottom=1in, inner=0.75in, outer=0.75in,
                    marginparwidth=2pc,heightrounded
            579
                    }%
            580
            581 \or % sigchi
                  \geometry{twoside=true, head=13pt,
            582
            583
                    paperwidth=8.5in, paperheight=11in,
                    includeheadfoot, columnsep=2pc,
                    top=66pt, bottom=73pt, inner=54pt, outer=54pt,
            585
                    marginparwidth=2pc,heightrounded
            586
                    }%
            587
            588 \or % sigchi-a
                  \geometry{twoside=false, head=13pt,
            589
            590
                    paperwidth=11in, paperheight=8.5in,
            591
                    includeheadfoot, marginparsep=72pt,
                    marginparwidth=170pt, columnsep=20pt,
            592
                    top=72pt, bottom=72pt, left=314pt, right=72pt
            593
            594
                    \@mparswitchfalse
            595
            596
                    \reversemarginpar
            597 \fi
\parindent Paragraphing
  \parskip
            598 \stlength\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@}%
            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: frontmatter 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@
    \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
623
       \unskip
624
       \ifvoid\@mpfootins\else
625
         \vskip\skip\@mpfootins
626
         \normalcolor
627
         \unvbox\@mpfootins
628
629
       \fi
       \@minipagefalse
     \color@endgroup
631
     \egroup
632
    \expandafter\@iiiparbox\@mpargs{\unvbox\@tempboxa}}
```

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 \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 \neq f_1{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
              have the libertine package installed. Please upgrade your
              669
                   TeX}\@ACM@newfontsfalse}
```

```
have the zi4 package installed. Please upgrade your
                         671
                               TeX}\@ACM@newfontsfalse}
                         672
                         have the newtxmath package installed. Please upgrade your
                                TeX}\@ACM@newfontsfalse}
                         675
                             We use Libertine throughout.
                         676 \if@ACM@newfonts
                         677 \RequirePackage[T1]{fontenc}
                         678 \ifxetex
                             \RequirePackage[tt=false]{libertine}
                             \setmonofont{inconsolata}
                         680
                         681 \else
                         682 \RequirePackage[tt=false, type1=true]{libertine}
                         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
                              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
                         {\tt 697 \ loss} \ and \ {\tt Description[2][]{\ loss}} \ and \ {\tt Description@presenttrue\ lignorespaces}}
                             The global warning
                         698 \AtEndDocument{\if@undescribed@images
                         \ensuremath{\mathsf{OPP}}\ \ClassWarningNoLine{\@classname}{Some images may lack descriptions}\fi}
```

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

```
700 \AtBeginEnvironment{figure}{\@Description@presentfalse
    \let\@vspace\@vspace@orig
    \let\@vspacer\@vspacer@orig}
702
703 \AtBeginEnvironment{figure*}{\@Description@presentfalse
    \let\@vspace\@vspace@orig
    \let\@vspacer\@vspacer@orig}
706 \AtEndEnvironment{figure}{\if@Description@present\else
    \global\@undescribed@imagestrue
707
    \ClassWarning{\@classname}{A possible image without description}\fi}
708
709 \AtEndEnvironment{figure*}{\if@Description@present\else
    \global\@undescribed@imagestrue
710
    \ClassWarning{\@classname}{A possible image without description}\fi}
711
712 \AtBeginEnvironment{table}{\let\@vspace\@vspace@orig
    \let\@vspacer\@vspacer@orig}
714 \AtBeginEnvironment{table*}{\let\@vspace\@vspace@orig
    \let\@vspacer\@vspacer@orig}
715
716 \AtBeginEnvironment{algorithm}{\let\@vspace\@vspace@orig
    \let\@vspacer\@vspacer@orig}
717
718 \AtBeginEnvironment{algorithm*}{\let\@vspace\@vspace@orig
    \let\@vspacer\@vspacer@orig}
720 \AtBeginEnvironment{lstlisting}{\let\@vspace\@vspace@orig
    \let\@vspacer\@vspacer@orig}
721
722 \AtBeginEnvironment{lstlisting*}{\let\@vspace\@vspace@orig
    \let\@vspacer\@vspacer@orig}
723
724
```

# 3.10 Floats

We use the caption package

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

```
\captionsetup{labelfont={bf},
                743
                         textfont={normalfont}, labelsep=period, margin=\z@}
                744
                     \or % sigchi
                745
                       \captionsetup[figure]{labelfont={bf, small},
                746
                         textfont={bf, small}}
                747
                       \captionsetup[table]{labelfont={bf, small},
                748
                         textfont={bf, small}}
                749
                     \or % sigchi-a
                750
                       \captionsetup[figure]{labelfont={bf, small},
                751
                         textfont={bf, small}}
                752
                       \captionsetup[table]{labelfont={bf, small},
                753
                         textfont={bf, small}}
                754
                755
                    \fi
                756\fi
      sidebar The sidebar environment:
                757 \newfloat{sidebar}{}{sbar}
                758 \floatname{sidebar}{Sidebar}
                759 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}
     \@sidebar The processing of the saved text
                760 \long\def\@sidebar#1{\bgroup\let\@vspace\@vspace@orig
                    \let\@vspacer\@vspacer@orig\captionsetup{type=sidebar}%
                     \marginpar{\small#1}\egroup}
 marginfigure The marginfigure environment:
                763 \newenvironment{marginfigure}{\Collect@Body\@marginfigure}{}
\@marginfigure The processing of the saved text
                764 \long\def\@marginfigure#1{\bgroup
                    \let\@vspace\@vspace@orig
                     \let\@vspacer\@vspacer@orig
                766
                     \captionsetup{type=figure}%
                767
                     \marginpar{\@Description@presentfalse\centering
                768
                       \small#1\if@Description@present\else
                769
                         \global\@undescribed@imagestrue
                770
                771
                         \ClassWarning{\@classname}{A possible image without description}
                         \fi}%
                772
                    \egroup}
                773
  margintable The margintable environment:
                774 \newenvironment{margintable}{\Collect@Body\@margintable}{}
\@margintable The processing of the saved text
                775 \long\def\@margintable#1{\bgroup\let\@vspace\@vspace@orig
                    \let\@vspacer\@vspacer@orig\captionsetup{type=table}%
                     \marginpar{\centering\small#1}\egroup}
```

```
\fulltextwidth We define the width of the boxes as
                   778 \newdimen\fulltextwidth
                   779 \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)
                   780 \if@ACM@sigchiamode
                   781 \def\@dblfloat{\bgroup\let\@vspace\@vspace@orig
                   782 \let\@vspacer\@vspacer@orig\columnwidth=\fulltextwidth
                   783 \let\@endfloatbox\@endwidefloatbox
                        \def\@fpsadddefault{\def\@fps{tp}}%
                   785 \@float}
                   786∖fi
    \end@dblfloat And the end. Just adding a \bgroup.
                   787 \if@ACM@sigchiamode
                   788 \def\end@dblfloat{%
                          \end@float\egroup}
                   789
                   790\fi
\@endwidefloatbox This is the end of a wide box—we basically move everything to the left
                   791 \def\@endwidefloatbox{%
                   792 \par\vskip\z@skip
                   793 \@minipagefalse
                   794 \outer@nobreak
                   795
                       \egroup
                        \color@endbox
                        \global\setbox\@currbox=\vbox{\moveleft
                   798
                          \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
                        \wd\@currbox=\textwidth
                   799
                   800 }
                    3.11 Lists
                   801 \ifcase\ACM@format@nr
                   802 \relax % manuscript
                   803 \or % acmsmall
                   804 \or % acmlarge
                   805 \or % acmtog
                   806 \or % sigconf
                   807 \or % siggraph
                   808 \or % sigplan
                   809 \def\labelenumi{\theenumi.}
                   810 \def\labelenumii{\theenumii.}
                   811 \def\labelenumiii{\theenumiii.}
                   812 \def\labelenumiv{\theenumiv.}
                   813 \or % sigchi
                   814 \or % sigchi-a
```

815 \fi

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.

```
816 \newdimen\@ACM@labelwidth
                   817 \AtBeginDocument{%
                       \setlength\labelsep{4pt}
                   818
                       \setlength{\@ACM@labelwidth}{6.5pt}
                   819
                   820
                       %% First-level list: when beginning after the first line of an
                   821
                   822
                       %% indented paragraph or ending before an indented paragraph, labels
                       %% should not hang to the left of the preceding/following text.
                   823
                        \setlength\leftmargini{\z@}
                   824
                        \addtolength\leftmargini{\parindent}
                   825
                        \addtolength\leftmargini{2\labelsep}
                   826
                        \addtolength\leftmargini{\@ACM@labelwidth}
                   827
                   828
                       %% Second-level and higher lists.
                   829
                       \setlength\leftmarginii{\z@}
                   830
                       \addtolength\leftmarginii{0.5\labelsep}
                   831
                       \addtolength\leftmarginii{\@ACM@labelwidth}
                   832
                       \setlength\leftmarginiii{\leftmarginii}
                   833
                   834
                       \setlength\leftmarginiv{\leftmarginiii}
                   835
                       \setlength\leftmarginv{\leftmarginiv}
                       \setlength\leftmarginvi{\leftmarginv}
                       \@listi}
                   837
                   838 \newskip\listisep
                   839 \listisep\smallskipamount
                   \labelwidth\leftmargini \advance\labelwidth-\labelsep
                       \listparindent\z@
                       \topsep\listisep}
                   844 \let\@listi\@listI
                   845 \def\@listii{\leftmargin\leftmarginii
                       \labelwidth\leftmarginii \advance\labelwidth-\labelsep
                   846
                   847
                       \topsep\z@skip}
                   848 \def\@listiii{\leftmargin\leftmarginiii
                       \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
                   850 \def\@listiv{\leftmargin\leftmarginiv
                       \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
                   852 \def\@listv{\leftmargin\leftmarginv
                       \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
                   854 \def\@listvi{\leftmargin\leftmarginvi
                       \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}
\descriptionlabel We do not use a colon by default like amsart does:
```

856 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}

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

```
857 \renewenvironment{description}{\list{}{%}
858 \labelwidth\@ACM@labelwidth
859 \let\makelabel\descriptionlabel}%
860 }{
861 \endlist
862 }
863 \let\enddescription=\endlist % for efficiency
```

# 3.12 Top-matter data

\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.

```
864 \newif\if@ACM@maketitle@typeset
865 \@ACM@maketitle@typesetfalse
```

We use the xkeyval interface to define journal titles and the relevant information

```
866 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
```

```
CIE,%
867
    CSUR,%
868
869
    DGOV,%
    DTRAP,%
    HEALTH,%
871
    IMWUT,%
872
    JACM,%
873
    JDIQ,%
874
    JEA,%
875
876
    JERIC,%
    JETC,%
877
    JOCCH,%
878
    PACMCGIT,%
879
    PACMHCI,%
880
    PACMPL,%
881
    POMACS,%
    TAAS,%
    TACCESS,%
884
    TACO,%
885
    TALG,%
886
    TALLIP,%
887
    TAP,%
888
    TCPS,%
889
    TDS,%
890
    TEAC,%
891
    TECS,%
892
    TELO,%
893
    THRI,%
894
895
    TIIS,%
    TIOT,%
```

```
TISSEC,%
897
              TIST,%
898
              TKDD,%
899
              TMIS,%
900
             TOCE,%
901
902
             TOCHI,%
903
              TOCL,%
             TOCS,%
904
             TOCT,%
905
             TODAES,%
906
             TODS,%
907
             TOG,%
908
              TOIS,%
             TOIT,%
910
             TOMACS,%
911
             TOMM,%
912
             TOMPECS,%
913
             TOMS,%
914
915
             TOPC,%
916
             TOPS,%
             TOPLAS,%
917
             TOS,%
918
             TOSEM,%
919
             TOSN,%
920
              TQC,%
921
             TRETS,%
922
              TSAS,%
923
             TSC,%
924
             TSLP,%
925
             TWEB,%
926
             FACMP%
927
928 }{%
929 \ifcase\@journalCode@nr
930 \relax % CIE
              \def\@journalName{ACM Computers in Entertainment}%
931
              \def\@journalNameShort{ACM Comput. Entertain.}%
932
              \label{lem:codeOne} $$ \end{1544-3574} % $$ \end{15444-3574} % $$ \end{154444-3574} % $$ \end{154444-3574} % $$ \end{154444} % $$ \end{154444-3574} % $$ \end{154444-3574} % $$ \end{154444-3574} % $$ \end{15444
933
934 \or % CSUR
              \def\@journalName{ACM Computing Surveys}%
              \def\@journalNameShort{ACM Comput. Surv.}%
936
937
              \def\@permissionCodeOne{0360-0300}%
938 \or % DGOV
              \def\@journalName{Digital Government: Research and Practice}%
939
              \def\@journalNameShort{Digit. Gov. Res. Pract.}%
940
941
              \def\@permissionCodeOne{2639-0175}%
942 \or % DTRAP
943
              \def\@journalName{Digital Threats: Research and Practice}%
              \def\@journalNameShort{Digit. Threat. Res. Pract.}%
944
              \label{lem:codeOne} $$ \ensuremath{\tt QpermissionCodeOne\{2576-5337\}\%}$
945
946 \or % HEALTH
```

```
\def\@journalName{ACM Transactions on Computing for Healthcare}%
947
    \def\@journalNameShort{ACM Trans. Comput. Healthcare}%
948
    \def\@permissionCodeOne{2637-8051}%
949
950 \or % IMWUT
    \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
951
      Wearable and Ubiquitous Technologies}%
   \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
953
    \def\@permissionCodeOne{2474-9567}%
954
    \@ACM@screentrue
955
    \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
956
957 \or % JACM
    \def\@journalName{Journal of the ACM}%
    \def\@journalNameShort{J. ACM}%
    \def\@permissionCodeOne{0004-5411}%
960
961 \or % JDIQ
    \def\@journalName{ACM Journal of Data and Information Quality}%
962
    \def\@journalNameShort{ACM J. Data Inform. Quality}%
963
    \def\@permissionCodeOne{1936-1955}%
964
965 \or % JEA
    \def\@journalName{ACM Journal of Experimental Algorithmics}%
966
    \def\@journalNameShort{ACM J. Exp. Algor.}%
967
    \def\@permissionCodeOne{1084-6654}%
968
969 \or % JERIC
    \def\@journalName{ACM Journal of Educational Resources in Computing}%
970
    \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
971
    \def\@permissionCodeOne{1073-0516}%
973\or % JETC
   \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
    \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
975
    \def\@permissionCodeOne{1550-4832}%
976
977 \or % JOCCH
    \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
    \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%
980 \or % PACMCGIT
   \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
981
    \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
982
    \def\@permissionCodeOne{2577-6193}%
983
    \@ACM@screentrue
    \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
986 \or % PACMHCI
    \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
987
    \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
988
    \def\@permissionCodeOne{2573-0142}%
989
    \@ACM@screentrue
990
    \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
991
992 \or % PACMPL
993
    \def\@journalName{Proceedings of the ACM on Programming Languages}%
994
    \def\@journalNameShort{Proc. ACM Program. Lang.}%
    \def\@permissionCodeOne{2475-1421}%
995
```

\@ACM@screentrue

```
\PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
998 \or % POMACS
    \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
     \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
1000
     \def\@permissionCodeOne{2476-1249}%
1001
     \@ACM@screentrue
1003
     \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1004 \or % TAAS
     \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
1005
     \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
1006
     \def\@permissionCodeOne{1556-4665}%
1007
1008 \or % TACCESS
     \def\@journalName{ACM Transactions on Accessible Computing}%
     \def\@journalNameShort{ACM Trans. Access. Comput.}%
1010
     \def\@permissionCodeOne{1936-7228}%
1011
1012 \or % TACO
     \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
     \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%
1014
1015 \or % TALG
1016
     \def\@journalName{ACM Transactions on Algorithms}%
     \def\@journalNameShort{ACM Trans. Algor.}%
1017
     \def\@permissionCodeOne{1549-6325}%
1018
1019 \or % TALLIP
    \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
     \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
     \def\@permissionCodeOne{2375-4699}%
     \def\@journalName{ACM Transactions on Applied Perception}%
1025 \or % TCPS
     \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
1027 \or % TDS
     \def\@journalName{ACM Transactions on Data Science}%
1029
     \def\@journalNameShort{ACM Trans. Data Sci.}%
     \def\@permissionCodeOne{2577-3224}%
1030
1031 \or % TEAC
     \def\@journalName{ACM Transactions on Economics and Computation}%
1032
1033 \or % TECS
     \def\@journalName{ACM Transactions on Embedded Computing Systems}%
     \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
     \def\@permissionCodeOne{1539-9087}%
1036
1037 \or % TFLO
     \def\@journalName{ACM Transactions on Evolutionary Learning}%
1038
     \def\@journalNameShort{ACM Trans. Evol. Learn.}%
1039
     \def\@permissionCodeOne{2688-3007}%
1040
1041 \or % THRI
     \def\@journalName{ACM Transactions on Human-Robot Interaction}%
     \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%
     \def\@permissionCodeOne{2573-9522}%
1044
1045 \or % TIIS
```

\def\@journalName{ACM Transactions on Interactive Intelligent Systems}%

```
\def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
1047
     \def\@permissionCodeOne{2160-6455}%
1048
1049 \or % TIOT
     \def\@journalName{ACM Transactions on Internet of Things}%
1050
     \def\@journalNameShort{ACM Trans. Internet Things}%
1051
     \def\@permissionCodeOne{2577-6207}%
1052
1053 \or % TISSEC
     \def\@journalName{ACM Transactions on Information and System Security}%
1054
     \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
1055
     \def\@permissionCodeOne{1094-9224}%
1056
1057 \or % TIST
     \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
1058
     \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
     \def\@permissionCodeOne{2157-6904}%
1060
1061 \or % TKDD
     \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
1062
     \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
1063
     \def\@permissionCodeOne{1556-4681}%
1064
1065 \or % TMIS
1066
     \def\@journalName{ACM Transactions on Management Information Systems}%
     \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
1067
     \def\@permissionCodeOne{2158-656X}%
1068
1069 \or % TOCE
     \def\@journalName{ACM Transactions on Computing Education}%
1070
     \def\@journalNameShort{ACM Trans. Comput. Educ.}%
1071
     \def\@permissionCodeOne{1946-6226}%
     \def\@journalName{ACM Transactions on Computer-Human Interaction}%
1074
     \def\@iournalNameShort{ACM Trans. Comput.-Hum. Interact.}%
1075
     \def\@permissionCodeOne{1073-0516}%
1076
1077 \or % TOCL
     \def\@journalName{ACM Transactions on Computational Logic}%
1078
1079
     \def\@journalNameShort{ACM Trans. Comput. Logic}%
     \def\@permissionCodeOne{1529-3785}%
1080
1081 \or % TOCS
     \def\@journalName{ACM Transactions on Computer Systems}%
1082
     \def\@journalNameShort{ACM Trans. Comput. Syst.}%
1083
     \label{lem:codeOne} $$ \ensuremath{\tt 0734-2071}\% $$
1084
1085 \or % TOCT
     \def\@journalName{ACM Transactions on Computation Theory}%
1086
1087
     \def\@journalNameShort{ACM Trans. Comput. Theory}%
     \def\@permissionCodeOne{1942-3454}%
1088
1089 \or % TODAES
    \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
1090
     \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
1091
     \def\@permissionCodeOne{1084-4309}%
1093 \or % TODS
     \def\@journalName{ACM Transactions on Database Systems}%
1094
     \def\@iournalNameShort{ACM Trans. Datab. Syst.}%
1095
```

\def\@permissionCodeOne{0362-5915}%

```
1097 \or % TOG
     \def\@journalName{ACM Transactions on Graphics}%
     \def\@journalNameShort{ACM Trans. Graph.}%
1099
     \def\@permissionCodeOne{0730-0301}
1101 \or % TOIS
    \def\@journalName{ACM Transactions on Information Systems}%
     \def\@permissionCodeOne{1046-8188}%
1103
1104\or % TOIT
     \def\@journalName{ACM Transactions on Internet Technology}%
1105
     \def\@journalNameShort{ACM Trans. Internet Technol.}%
1106
     \def\@permissionCodeOne{1533-5399}%
1107
1108 \or % TOMACS
     \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
     \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
1110
1111 \or % TOMM
    \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
     \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
     \def\@permissionCodeOne{1551-6857}%
     \def\@permissionCodeTwo{0100}%
1116 \or % TOMPECS
    \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
     \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1118
     \def\@permissionCodeOne{2376-3639}%
1119
1120 \or % TOMS
     \def\@journalName{ACM Transactions on Mathematical Software}%
1121
     \def\@journalNameShort{ACM Trans. Math. Softw.}%
     \def\@permissionCodeOne{0098-3500}%
1123
1124 \or % TOPC
     \def\@journalName{ACM Transactions on Parallel Computing}%
1125
     \def\@journalNameShort{ACM Trans. Parallel Comput.}%
1126
     \def\@permissionCodeOne{1539-9087}%
1127
1128 \or % TOPS
1129
     \def\@journalName{ACM Transactions on Privacy and Security}%
     \def\@journalNameShort{ACM Trans. Priv. Sec.}%
1130
     \def\@permissionCodeOne{2471-2566}%
1131
1132 \or % TOPLAS
     \def\@journalName{ACM Transactions on Programming Languages and Systems}%
1133
     \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
     \def\@permissionCodeOne{0164-0925}%
1135
1136 \or % TOS
     \def\@journalName{ACM Transactions on Storage}%
1137
     \def\@journalNameShort{ACM Trans. Storage}%
1138
     \def\@permissionCodeOne{1553-3077}%
1139
1140 \or % TOSEM
     \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
     \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
1143
     \def\@permissionCodeOne{1049-331X}%
1144 \or % TOSN
     \def\@iournalName{ACM Transactions on Sensor Networks}%
1145
```

\def\@journalNameShort{ACM Trans. Sensor Netw.}%

```
1148 \or % TQC
                     \def\@journalName{ACM Transactions on Quantum Computing}%
                     \def\@journalNameShort{ACM Trans. Quantum Comput.}%
               1150
                     \def\@permissionCodeOne{2643-6817}%
               1151
               1152 \or % TRETS
                    \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
               1153
                     \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
               1154
                    \def\@permissionCodeOne{1936-7406}%
               1155
               1156 \or % TSAS
                     \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
               1157
                     \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
                     \def\@permissionCodeOne{2374-0353}%
               1160 \or % TSC
                     \def\@journalName{ACM Transactions on Social Computing}%
               1161
                     \def\@journalNameShort{ACM Trans. Soc. Comput.}%
               1162
                     \def\@permissionCodeOne{2469-7818}%
               1163
               1164 \or % TSLP
                    \def\@journalName{ACM Transactions on Speech and Language Processing}%
               1165
                     \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
               1166
                     \def\@permissionCodeOne{1550-4875}%
               1167
               1168 \or % TWEB
                     \def\@journalName{ACM Transactions on the Web}%
               1169
                     \def\@journalNameShort{ACM Trans. Web}%
               1170
                     \def\@permissionCodeOne{1559-1131}%
               1171
               1172 \else % FACMP, a dummy journal
                     \def\@journalName{Forthcoming ACM Publication}%
               1173
                     \def\@journalNameShort{ACM Forthcoming}%
               1174
                     \def\@permissionCodeOne{XXXX-XXXX}%
               1175
               1176 \fi
               1177 \ClassInfo{\@classname}{Using journal code \@journalCode}%
                     \ClassError{\@classname}{Incorrect journal #1}%
               1180 }%
  \acmJournal And the syntactic sugar around it
               1181 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}%
                    \global\@ACM@journal@bibstriptrue}
                    The defaults:
               1183 \def\@journalCode@nr{0}
               1184 \def\@journalName{}%
               1185 \def\@journalNameShort{\@journalName}%
               1186 \def\@permissionCodeOne{XXXX-XXXX}%
               1187 \def\@permissionCodeTwo{}%
\acmConference This is the conference command
               1188 \newcommand\acmConference[4][]{%
               1189 \gdef\acmConference@shortname{#1}%
```

\def\@permissionCodeOne{1550-4859}%

```
\gdef\acmConference@name{#2}%
                      1190
                           \gdef\acmConference@date{#3}%
                      1191
                           \gdef\acmConference@venue{#4}%
                      1192
                           \ifx\acmConference@shortname\@empty
                      1193
                              \gdef\acmConference@shortname{#2}%
                      1194
                      1195
                           \fi
                      1196
                           \global\@ACM@journal@bibstripfalse
                      1197 }
                      1198 \if@ACM@journal\else
                      1199 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
                      1200 DC, USA}%
                      1201\fi
        \acmBooktitle The book title of the conference:
       1203 \acmBooktitle{Proceedings of \acmConference@name
                                 \ifx\acmConference@name\acmConference@shortname\else
                      1204
                                   \ (\acmConference@shortname)\fi}
                      1205
      \@editorsAbbrev How to abbreviate editors
                      1206 \def\@editorsAbbrev{(Ed.)}
         \@acmEditors The list of editors
                      1207 \def\@acmEditors{}
              \editor Add a new editor to the list
                      1208 \def\editor#1{\ifx\@acmEditors\@empty
                              \gdef\@acmEditors{#1}%
                      1209
                           \else
                      1210
                              \gdef\@editorsAbbrev{(Eds.)}%
                      1211
                              \g@addto@macro\@acmEditors{\and#1}%
                      1212
                      1213 \fi}
            \subtitle The subtitle macro
                      1214 \def\subtitle#1{\def\@subtitle{#1}}
                      1215 \subtitle{}
    \num@authorgroups The total number of "groups". Each group is several authors with the same affiliations(s)
                      1216 \newcount\num@authorgroups
                      1217 \num@authorgroups=0\relax
         \num@authors The total number of authors
                      1218 \newcount\num@authors
                      1219 \num@authors=0\relax
\if@insideauthorgroup Whether we are continuing an author group
                      1220 \newif\if@insideauthorgroup
                      1221 \@insideauthorgroupfalse
```

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

```
1222 \renewcommand\author[2][]{%
     \IfSubStr{#2}{,}{\ClassWarning{\Classname}{Do not put several}}
1223
         authors in the same \string\author\space macro!}}{}%
1224
1225
     \global\advance\num@authors by 1\relax
1226
     \if@insideauthorgroup\else
       \global\advance\num@authorgroups by 1\relax
1227
       \global\@insideauthorgrouptrue
1228
1229
     \ifx\addresses\@empty
1230
       \if@ACM@anonymous
1231
         \gdef\addresses{\@author{Anonymous Author(s)%
1232
           \ifx\@acmSubmissionID\@empty\else\\Submission Id:
1233
              \@acmSubmissionID\fi}}%
1234
         \gdef\authors{Anonymous Author(s)}%
1235
       \else
1236
         \gdef\addresses{\@author{#2}}%
1237
1238
         \gdef\authors{#2}%
1239
       \fi
     \else
1240
       \if@ACM@anonvmous\else
1241
         \g@addto@macro\addresses{\and\@author{#2}}%
1242
         \g@addto@macro\authors{\and#2}%
1243
       \fi
1244
     \fi
1245
     \if@ACM@anonymous
1246
       \ifx\shortauthors\@empty
1247
         \gdef\shortauthors{Anon.
1248
           1249
           \@acmSubmissionID\fi}%
1250
       \fi
1251
1252
     \else
       \def\@tempa{#1}%
1253
       \ifx\@tempa\@empty
1254
         \ifx\shortauthors\@empty
1255
           \gdef\shortauthors{#2}%
1256
1257
           \g@addto@macro\shortauthors{\and#2}%
1258
         \fi
1259
1260
         \ifx\shortauthors\@empty
1261
           \gdef\shortauthors{#1}%
1262
         \else
1263
1264
            \g@addto@macro\shortauthors{\and#1}%
1265
         \fi
       \fi
1266
     \fi}
1267
```

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

```
argument, which we use differently from amsart.
                                                                       1268 \newcommand{\affiliation}[2][]{%
                                                                                   \global\@insideauthorgroupfalse
                                                                       1269
                                                                                   \if@ACM@anonymous\else
                                                                       1270
                                                                       1271
                                                                                       \g@addto@macro\addresses{\affiliation{#1}{#2}}%
@ACM@affiliation@obeypunctuation Whether to use the author's punctuation (false by default, which adds American-style
                                                                         address punctuation)
                                                                       1273 \define@boolkey+{@ACM@affiliation@}[@ACM@affiliation@]{obeypunctuation}%
                                                                       1274 [true]{}{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}
                     \additional affiliation Additional affiliations go to footnotes
                                                                       1275 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}
                   \@additionalaffiliation Process \additionalaffiliation inside \authornote
                                                                       1276 \def\@additionalaffiliation#1{\bgroup
                                                                                   \def\position##1{\ignorespaces}%
                                                                                   \def\institution##1{##1\ignorespaces}%
                                                                       1278
                                                                                   \def\department{\@ifnextchar[{\@department}{\@department[]}}%
                                                                       1279
                                                                                  \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
                                                                       1281 \let\streetaddress\position
                                                                       1282 \let\city\position
                                                                       1283 \let\state\position
                                                                       1284 \let\postcode\position
                                                                                  \let\country\position
                                                                       1285
                                                                       1286
                                                                                 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.
                                                                       1287 \renewcommand{\email}[2][]{%
                                                                                   \footnote{Model} \ \footnote{M
                                                                       1288
                                                                                           addresses in the same \string\email\space macro!}}{}%
                                                                       1289
                                                                                   \if@ACM@anonymous\else
                                                                                       \g@addto@macro\addresses{\email{#1}{\#2}}\%
                                                                       1291
                                                                                  \fi}
                                                                       1292
                                                        \orcid Right now we do not typeset ORCIDs
                                                                       1293 \def\orcid#1{\unskip\ignorespaces}
                                \authorsaddresses Setting up authors' addresses
                                                                       1294 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
                                                                       1295 \authorsaddresses{\@mkauthorsaddresses}
                                          \@titlenotes The title notes
                                                                       1296 \def\@titlenotes{}
```

```
\titlenote Adding a note to the title
                1297 \def\titlenote#1{%
                      \g@addto@macro\@title{\footnotemark}%
                1298
                      \if@ACM@anonymous
                1299
                1300
                        \g@addto@macro\@titlenotes{%
                          \stepcounter{footnote}\footnotetext{Title note}}%
                1301
                     \else
                1302
                        \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
                1303
                1304
\@subtitlenotes The subtitle notes
                1305 \def\@subtitlenotes{}
  \subtitlenote Adding a note to the subtitle
                1306 \def\subtitlenote#1{%
                     \g@addto@macro\@subtitle{\footnotemark}%
                1307
                     \if@ACM@anonymous
                1308
                        \g@addto@macro\@subtitlenotes{%
                1309
                          \stepcounter{footnote}\footnotetext{Subtitle note}}%
                1310
                1311
                     \else
                        \g@addto@macro\@subtitlenotes{%
                1312
                          \stepcounter{footnote}\footnotetext{#1}}%
                1313
                     \fi}
                1314
  \@authornotes The author notes
                1315 \def\@authornotes{}
    \authornote Adding a note to the author
                1316 \def\authornote#1{%
                     \if@ACM@anonymous\else
                        \g@addto@macro\addresses{\@authornotemark}%
                1318
                        \g@addto@macro\@authornotes{%
                1319
                          \stepcounter{footnote}\footnotetext{#1}}%
                1320
                     \fi}
                1321
\authornotemark Adding a footnote mark to the authors
                1322 \newcommand\authornotemark[1][\relax]{%
                     \ifx#1\relax\relax\relax
                     \g@addto@macro\addresses{\@authornotemark}\%
                1324
                1325
                     \g@addto@macro\addresses{\@@authornotemark{#1}}%
                1326
                1327 \fi}
     \acmVolume The current volume
                1328 \def\acmVolume#1{\def\@acmVolume{#1}}
                1329 \acmVolume{1}
     \acmNumber The current number
                1331 \acmNumber{1}
```

```
\acmArticle The current article
                    1332 \def\acmArticle#1{\def\@acmArticle{#1}}
                    1333 \acmArticle{}
   \acmArticleSeq The sequence number
                    1334 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
                    1335 \acmArticleSeq{\@acmArticle}
          \acmYear The current year
                    1336 \def\acmYear#1{\def\@acmYear{#1}}
                    1337 \acmYear{\the\year}
         \acmMonth The current month
                    1338 \def\acmMonth#1{\def\@acmMonth{#1}}
                    1339 \acmMonth{\the\month}
     \@acmPubDate The publication date
                    {\tt 1340 \backslash def \backslash @acmPubDate \{ \backslash if case \backslash @acmMonth \backslash or \}}
                    1341 January\or February\or March\or April\or May\or June\or
                    1342 July\or August\or September\or October\or November\or
                    1343 December\fi~\@acmYear}
         \acmPrice The price
                    1344 \def\acmPrice#1{\def\@acmPrice{#1}}
                    1345 \acmPrice{15.00}
 \acmSubmissionID The submission ID
                    1346 \def\acmSubmissionID#1{\def\@acmSubmissionID{#1}}
                    1347 \acmSubmissionID{}
          \acmISBN The book ISBN
                    1348 \ensuremath{\def\ensuremath{\def\ensuremath{\def\floor} \{#1\}}
                    1349 \acmISBN{978-x-xxxx-xxxx-x/YY/MM}
           \acmDOI The paper DOI
                    1350 \def\acmDOI#1{\def\@acmDOI{#1}}
                    1351 \acmDOI{10.1145/nnnnnnn.nnnnnnn)
    \if@ACM@badge Whether to print a badge. Note that either a left or right badge triggers it:
                    1352 \newif\if@ACM@badge
                    1353 \@ACM@badgefalse
\@ACM@badge@width The width of the badge
                    1354 \newlength\@ACM@badge@width
                    1355 \setlength\@ACM@badge@width{5pc}
\@ACM@title@width The width of the badge
                    1356 \newlength\@ACM@title@width
```

```
\@ACM@badge@skip The space between the badge and the title
                 1357 \newlength\@ACM@badge@skip
                 1358 \setlength\@ACM@badge@skip{1pc}
      \acmBadgeR Setting the right badge
                 1360 \def\@acmBadgeR@url{#1}%
                 1361 \def\@acmBadgeR@image{#2}}
                 1362 \def\@acmBadgeR@url{}
                 1363 \def\@acmBadgeR@image{ }
      \acmBadgeL Setting the left badge
                 1364 \newcommand\acmBadgeL[2][]{\@ACM@badgetrue
                 1365 \def\@acmBadgeL@url{#1}%
                 1366 \def\@acmBadgeL@image{#2}}
                 1367 \def\@acmBadgeL@url{}
                 1368 \def\@acmBadgeL@image{}
      \startPage The start page of the paper
                 1369 \def\startPage#1{\def\@startPage{#1}}
                 1370 \startPage{}
          \terms Terms are obsolete. We use CCS now.
                 {\tt 1371 \backslash def\backslash terms\#1{\backslash ClassWarning{\backslash @classname}}} \\ The command {\tt string\backslash terms{}} is
                         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.
                 1373 \def\keywords#1{\def\@keywords{#1}}
                 1374 \let\@keywords\@empty
                 1375 \AtEndDocument{\if@ACM@nonacm\else\ifx\@keywords\@empty
                       \ifnum\getrefnumber{TotPages}>2\relax
                       \ClassWarningNoLine{\@classname}{ACM keywords are mandatory
                 1377
                         for papers over two pages}%
                 1378
                      \fi\fi\fi}
                 1379
        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
                 1380 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
  \@saveabstract And saving the abstract
                 1381 \long\def\@saveabstract#1{\if@ACM@maketitle@typeset
                       \ClassError{\@classname}{Abstract must be defined before maketitle
                         command. Please move it!}\fi
                 1384 \long\gdef\@abstract{#1}}
                 1385 \@saveabstract{}
```

```
\@lempty The long version of \@empty (to compare with \@abstract)
                    1386 \long\def\@lempty{}
  \if@ACM@printccs Whether to print CCS
                    1387 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
                          \if@ACM@printccs
                            \ClassInfo{\@classname}{Printing CCS}%
                    1389
                    1390
                    1391
                            \ClassInfo{\@classname}{Suppressing CCS}%
                    1392 fi}{ClassError{Qclassname}{The option printces can be either true or false}}
\if@ACM@printacmref Whether to print the ACM bibstrip
                    1393 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
                          \if@ACM@printacmref
                            \ClassInfo{\@classname}{Printing bibformat}%
                    1395
                          \else
                    1396
                            \ClassInfo{\@classname}{Suppressing bibformat}%
                    1397
                         fi}{\classError{\classname}{The option printacmref can be either true or false}}
                    1398
                    1399 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@printacmref\else
                         \ifnum\getrefnumber{TotPages}>1\relax
                          \ClassWarningNoLine{\@classname}{ACM reference format is mandatory
                            for papers over one page}%
                         \fi\fi\fi}
                    1403
\if@ACM@printfolios Whether to print folios
                    1404 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
                         \if@ACM@printfolios
                    1405
                            \ClassInfo{\@classname}{Printing folios}%
                    1406
                    1407
                            \ClassInfo{\@classname}{Suppressing folios}%
                    1409 \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.
                    1410 \define@cmdkey{@ACM@topmatter@}[@ACM@]{authorsperrow}[0]{%
                          \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorsperrow to
                    1411
                              #1}}{\ClassWarning{\@classname}{The parameter authorsperrow must be
                    1412
                              numerical. Ignoring the input #1}\gdef\@ACM@authorsperrow{0}}}
                    1413
      \settopmatter The usual syntactic sugar
                    1414 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
                         Now the settings
                    1415 \settopmatter{printccs=true, printacmref=true}
                    1416 \if@ACM@manuscript
                    1417 \settopmatter{printfolios=true}
                    1418 \else
                    1419
                          \if@ACM@journal
                    1420
                            \settopmatter{printfolios=true}
```

```
\else
               1421
                       \settopmatter{printfolios=false}
               1422
                    \fi
               1423
               1424\fi
               1425 \settopmatter{authorsperrow=0}
    \@received The container for the paper history
               1426 \def\@received{}
     \received The \received command
               1427 \newcommand\received[2][]{\def\@tempa{#1}%
                     \ifx\@tempa\@empty
               1428
                       \ifx\@received\@empty
               1429
                         \gdef\@received{Received #2}%
               1430
                       \else
               1431
                         \g@addto@macro{\@received}{; revised #2}%
               1432
               1433
               1434
                     \else
                       \ifx\@received\@empty
               1435
                         \gdef\@received{#1 #2}%
               1436
               1437
                       \else
                         \g@addto@macro{\@received}{; #1 #2}%
               1438
                       \fi
               1439
                    \fi}
               1440
               1441 \AtEndDocument{%
                     \ifx\@received\@empty\else
               1442
                       \par\bigskip\noindent\small\normalfont\@received\par
               1443
               1444
                        Concepts system
                We exclude CCSXML stuff generated by the ACM system:
               1445 \RequirePackage{comment}
               1446 \excludecomment{CCSXML}
    \@concepts This is the storage macro and counter for concepts
               1447 \let\@concepts\@empty
               1448 \newcounter{@concepts}
      \ccsdesc The first argument is the significance, the second is the concept(s)
               1449 \newcommand\ccsdesc[2][100]{%
                     \ccsdesc@parse#1~#2~~\ccsdesc@parse@end}
\ccsdesc@parse The parser of the expression Significance~General~Specific (we need textcomp for
                \textrightarrow). Note that Specific can be empty!
               1451 \RequirePackage{textcomp}
               1452 \def\ccsdesc@parse#1~#2~#3~{%
               1453 \stepcounter{@concepts}%
```

```
\expandafter\ifx\csname CCS@General@#2\endcsname\relax
                     1454
                            \expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
                     1455
                              \textbf{#2}}%
                     1456
                            \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{; }%
                     1457
                            \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
                     1458
                          \g@addto@macro{\@concepts}{\csname CCS@General@#2\endcsname
                     1459
                            \csname CCS@Punctuation@#2\endcsname
                     1460
                            \csname CCS@Specific@#2\endcsname}%
                     1461
                          \fi
                     1462
                          \ifx#3\relax\relax\else
                     1463
                            \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
                     1464
                              \textrightarrow\ }%
                     1465
                           \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
                     1466
                             \addtocounter{@concepts}{-1}%
                     1467
                             1468
                             1469
                             #3\fi\fi\ifnum\value{@concepts}=0.\else; \fi}%
                     1470
                          \fi
                     1471
                     1472 \ccsdesc@parse@finish}
                     1473 \AtEndDocument{\if@ACM@nonacm\else\ifx\@concepts\@empty\relax
                          \ifnum\getrefnumber{TotPages}>2\relax
                     1475
                          \ClassWarningNoLine{\@classname}{CCS concepts are mandatory
                     1476
                            for papers over two pages}%
                     1477
                          \fi\fi\fi}
\ccdesc@parse@finish Gobble everything to \ccsdesc@parse@end
                     1478 \def\ccsdesc@parse@finish#1\ccsdesc@parse@end{}
                             Copyright system
                      3.14
                      This is from acmcopyright.sty
 \if@printcopyright Whether to print a copyright symbol
                     1479 \newif\if@printcopyright
                     1480 \@printcopyrighttrue
 \if@printpermission Whether to print the permission block
                     1481 \newif\if@printpermission
                     1482 \@printpermissiontrue
       \if@acmowned Whether the ACM owns the rights to the paper
                     1483 \newif\if@acmowned
                     1484 \@acmownedtrue
                         Keys:
                     1485 \define@choicekey*{ACM@}{acmcopyrightmode}[%
                          \acm@copyrightinput\acm@copyrightmode]{none,%
                            acmcopyright, acmlicensed, rightsretained, %
```

```
usgov, usgovmixed, cagov, cagovmixed, licensedusgovmixed, %
1488
       licensedcagov, licensedcagovmixed, othergov, licensedothergov, %
1489
       iw3c2w3,iw3c2w3g}{%
1490
     \@printpermissiontrue
1491
     \@printcopyrighttrue
1492
1493
     \@acmownedtrue
1494
     \ifnum\acm@copyrightmode=0\relax % none
      \@printpermissionfalse
1495
      \@printcopyrightfalse
1496
      \@acmownedfalse
1497
     ۱fi
1498
     \ifnum\acm@copyrightmode=2\relax % acmlicensed
1499
      \@acmownedfalse
1500
1501
     \ifnum\acm@copyrightmode=3\relax % rightsretained
1502
      \@acmownedfalse
1503
      \AtBeginDocument{\acmPrice{}}%
1504
1505
     \ifnum\acm@copyrightmode=4\relax % usgov
1506
1507
      \@printpermissiontrue
      \@printcopyrightfalse
1508
      \@acmownedfalse
1509
      \AtBeginDocument{\acmPrice{}}%
1510
1511
     \ifnum\acm@copyrightmode=6\relax % cagov
1512
      \@acmownedfalse
1513
1514
     \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1515
      \@acmownedfalse
1516
     \fi
1517
     \ifnum\acm@copyrightmode=9\relax % licensedcagov
1518
1519
      \@acmownedfalse
1520
     \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1521
      \@acmownedfalse
1522
1523
     \ifnum\acm@copyrightmode=11\relax % othergov
1524
      \@acmownedtrue
1525
1526
     \ifnum\acm@copyrightmode=12\relax % licensedothergov
1527
1528
      \@acmownedfalse
1529
     \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1530
      \@acmownedfalse
1531
1532
      \AtBeginDocument{\acmPrice{}}%
1533
1534
     \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
      \@acmownedfalse
1535
      \AtBeginDocument{\acmPrice{}}%
1536
```

\fi}

```
\setcopyright This is the syntactic sugar around setting keys.
                      1538 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
                      1539 \setcopyright{acmcopyright}
     \@copyrightowner Here is the owner of the copyright
                      1540 \def\@copyrightowner{%
                      1541 \ifcase\acm@copyrightmode\relax % none
                      1542 \or % acmcopyright
                      1543 Association for Computing Machinery.
                      1544 \or % acmlicensed
                           Copyright held by the owner/author(s). Publication rights licensed to
                      1545
                      1546
                           ACM\@.
                            \or % rightsretained
                      1547
                            Copyright held by the owner/author(s).
                      1548
                      1549
                            \or % usgov
                           \or % usgovmixed
                      1550
                      1551 Association for Computing Machinery.
                          \or % cagov
                      1552
                      1553 Crown in Right of Canada.
                           \or %cagovmixed
                      1555 Association for Computing Machinery.
                           \or %licensedusgovmixed
                      1556
                      1557 Copyright held by the owner/author(s). Publication rights licensed to
                      1558 ACM\@.
                      1559
                           \or % licensedcagov
                           Crown in Right of Canada. Publication rights licensed to
                      1560
                           ACM\@.
                           \or %licensedcagovmixed
                      1562
                           Copyright held by the owner/author(s). Publication rights licensed to
                      1563
                      1564 ACM\@.
                      1565 \or % othergov
                      1566 Association for Computing Machinery.
                      1567 \or % licensedothergov
                      1568 Copyright held by the owner/author(s). Publication rights licensed to
                      1569 ACM\@.
                      1570 \or % ic2w3www
                      1571 IW3C2 (International World Wide Web Conference Committee), published
                           under Creative Commons CC-BY~4.0 License.
                      1572
                      1573
                           \or % ic2w3wwwgoogle
                      1574 IW3C2 (International World Wide Web Conference Committee), published
                           under Creative Commons CC-BY-NC-ND~4.0 License.
                      1576
                           \fi}
          \@formatdoi Print a clickable DOI
                      1577 \def\@formatdoi#1{\url{https://doi.org/#1}}
\@copyrightpermission The canned permission block.
```

1578 \def\@copyrightpermission{%

1579 \ifcase\acm@copyrightmode\relax % none

```
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      work for personal or classroom use is granted without fee provided
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      that copies are not made or distributed for profit or commercial
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1610 \or % usgov

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      purposes only.
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                                                 disseminate the work on their personal and corporate Web sites with
                                   1698
                                   1699
                                                 the appropriate attribution.
                                   1700 \fi}
  \copyrightyear By default, the copyright year is the same as \acmYear, but one can override this:
                                   1701 \def\copyrightyear#1{\def\@copyrightyear{#1}}
                                   1702 \copyrightyear{\@acmYear}
\@teaserfigures The teaser figures container
                                   1703 \def\@teaserfigures{}
      teaserfigure The teaser figure
                                   1704 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}
      \@saveteaser Saving the teaser
                                   \label{longdef} $$1705 \leq \ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\en
                 \thanks We redefine amsart \thanks so the anonymous key works
                                   1706 \renewcommand{\thanks}[1]{%
                                               \@ifnotempty{#1}{%
                                   1707
                                                   \if@ACM@anonymous
                                   1708
                                   1709
                                                        \g@addto@macro\thankses{\thanks{A note}}%
                                   1710
                                                 \else
                                                   \g@addto@macro\thankses{\thanks{#1}}%
                                   1711
                                   1712
                                                 fi}
```

#### Typesetting top matter 3.15

\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  $\ensuremath{\langle etwocolumn[\langle box \rangle]}$ .

1713 \newbox\mktitle@bx

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

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.

```
1714 \def\maketitle{%
             \@ACM@maketitle@typesettrue
1715
1716
             \if@ACM@anonymous
                  % Anonymize omission of \author-s
1717
                  \ifnum\num@authorgroups=0\author{}\fi
1718
1719
             \begingroup
1720
             \let\@vspace\@vspace@orig
1721
             \let\@vspacer\@vspacer@orig
1722
             \let\@footnotemark\@footnotemark@nolink
1723
             \let\@footnotetext\@footnotetext@nolink
1724
             \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1725
             \hsize=\textwidth
1726
             \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1727
             \verb|\del{condition}| \end{condition} \label{lem:condition} $$ \end{condition} $$ \end{con
1728
1729
             \@printtopmatter
             \if@ACM@sigchiamode\@mkauthors\fi
1730
             \setcounter{footnote}{0}%
1731
             \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1732
             \@titlenotes
1733
             \@subtitlenotes
1734
             \@authornotes
1735
             \let\@makefnmark\relax
             \let\@thefnmark\relax
1737
             \let\@makefntext\noindent
1738
             \ifx\@empty\thankses\else
1739
                  \footnotetextauthorsaddresses{%
1740
1741
                       \def\par{\let\par\@par}\parindent\z@\@setthanks}%
             \fi
1742
             \ifx\@empty\@authorsaddresses\else
1743
                    \if@ACM@anonymous\else
1744
                         \if@ACM@journal@bibstrip
1745
                              \footnotetextauthorsaddresses{%
1746
                                   \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
1747
                         \fi
1748
                    \fi
1749
             \fi
1750
             \if@ACM@nonacm\else\footnotetextcopyrightpermission{%
1751
                  \if@ACM@authordraft
1752
                           1753
1754
                                     Unpublished working draft. Not for distribution.}}%
1755
                         \color[gray]{0.9}%
                  \fi
1756
                  \parindent\z@\parskip0.1\baselineskip
1757
```

```
\if@ACM@authorversion\else
1758
         \if@printpermission\@copyrightpermission\par\fi
1759
       \fi
1760
       \if@ACM@manuscript\else
1761
          \if@ACM@journal@bibstrip\else % Print the conference information
1762
1763
         1764
          \fi
1765
       \if@printcopyright
1766
         \copyright\ \@copyrightyear\ \@copyrightowner\\
1767
       \else
1768
1769
         \@copyrightyear.\
       \fi
1770
       \if@ACM@manuscript
1771
        Manuscript submitted to ACM\\
1772
       \else
1773
         \if@ACM@authorversion
1774
            This is the author's version of the work. It is posted here for
1775
1776
            your personal use. Not for redistribution. The definitive Version
1777
            of Record was published in
            \if@ACM@journal@bibstrip
1778
              \emph{\@journalName}%
1779
            \else
1780
               \emph{\@acmBooktitle}%
1781
1782
            \fi
            \ifx\@acmDOI\@empty
1783
1784
             \else
1785
               , \@formatdoi{\@acmDOI}.
1786
            \fi\\
1787
          \else
1788
1789
            \if@ACM@nonacm\else
1790
              \if@ACM@journal@bibstrip
                \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1791
                \ifx\@acmPrice\@empty\else\ \$\@acmPrice\fi\\
1792
                \@formatdoi{\@acmDOI}%
1793
              \else % Conference
1794
                1795
                \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\\\fi
                \int \mathbb{Q}_{\mathbb{Q}}\
1797
1798
            \fi
1799
          \fi
1800
         \fi}
1801
1802
       \fi
1803
     \endgroup
1804
     \setcounter{footnote}{0}%
1805
     \@mkabstract
     \if@ACM@printccs
1806
     \ifx\@concepts\@empty\else\bgroup
1807
```

```
\noindent\@concepts\par}\egroup
                  1809
                           \fi
                  1810
                         \fi
                  1811
                         \ifx\@keywords\@empty\else\bgroup
                  1812
                  1813
                            {\if@ACM@journal
                  1814
                                \@specialsection{Additional Key Words and Phrases}%
                  1815
                             \else
                                \@specialsection{Keywords}%
                  1816
                             \fi
                  1817
                                \noindent\@keywords}\par\egroup
                  1818
                  1819
                         \fi
                        \andify\authors
                  1820
                        \andify\shortauthors
                  1821
                        \global\let\authors=\authors
                  1822
                        \global\let\shortauthors=\shortauthors
                  1823
                        \if@ACM@printacmref
                  1824
                           \@mkbibcitation
                  1825
                  1826
                        \fi
                  1827
                        \hypersetup{%
                          pdfauthor={\authors},
                  1828
                          pdftitle={\@title},
                  1829
                          pdfsubject={\@concepts},
                  1830
                          pdfkeywords={\@keywords},
                  1831
                          pdfcreator = \{LaTeX\ with\ acmart
                  1832
                            \csname ver@acmart.cls\endcsname\space
                  1833
                            and hyperref
                  1834
                            \csname ver@hyperref.sty\endcsname}}%
                  1835
                        \global\@topnum\z@ % this prevents floats from falling
                  1836
                                            % at the top of page 1
                  1837
                        \global\@botnum\z@ % we do not want them to be on the bottom either
                  1838
                  1839
                        \@printendtopmatter
                  1840
                        \@afterindentfalse
                        \@afterheading
                  1841
                  1842 }
\@specialsection This macro starts sections for proceedings and uses \small for journals
                  1843 \def\@specialsection#1{%
                        \bgroup
                  1844
                        \let\@vspace\@vspace@orig
                  1845
                        \let\@vspacer\@vspacer@orig
                  1846
                        \ifcase\ACM@format@nr
                  1847
                  1848
                        \relax % manuscript
                          \par\medskip\small\noindent#1: %
                  1849
                        \or % acmsmall
                  1850
                          \par\medskip\small\noindent#1: %
                  1851
                        \or % acmlarge
                  1852
                          \par\medskip\small\noindent#1: %
                  1853
                  1854
                        \or % acmtog
                          \par\medskip\small\noindent#1: %
                  1855
```

{\@specialsection{CCS Concepts}%

1808

```
\or % sigconf
1856
        \section*{#1}%
1857
     \or % siggraph
1858
        \section*{#1}%
1859
1860
     \or % sigplan
1861
         \noindent\emph{\bfseries#1.}~%
1862
     \or % sigchi
       \section*{#1}%
1863
     \or % sigchi-a
1864
        \section*{#1}%
1865
        \fi
1866
     \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.

```
1868 \def\@printtopmatter{%
     \ifx\@startPage\@empty
1869
         \gdef\@startPage{1}%
1870
     \else
1871
         \setcounter{page}{\@startPage}%
1872
     \fi
1873
     \thispagestyle{firstpagestyle}%
1874
1875
     \noindent
     \ifcase\ACM@format@nr
1876
     \relax % manuscript
1877
        \box\mktitle@bx\par
1878
     \or % acmsmall
1879
       \box\mktitle@bx\par
1880
     \or % acmlarge
1881
        \box\mktitle@bx\par
1882
     \or % acmtog
1883
       \twocolumn[\box\mktitle@bx]%
1884
     \or % sigconf
1885
       \twocolumn[\box\mktitle@bx]%
1886
     \or % siggraph
1887
1888
       \twocolumn[\box\mktitle@bx]%
     \or % sigplan
1889
       \twocolumn[\box\mktitle@bx]%
1890
     \or % sigchi
1891
       \twocolumn[\box\mktitle@bx]%
1892
     \or % sigchi-a
1893
       \par\box\mktitle@bx\par\bigskip
1894
        \if@ACM@badge
1895
           \marginpar{\noindent
1896
             \ifx\@acmBadgeL@image\@empty\else
1897
               \href{\@acmBadgeL@url}{%
1898
                 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1899
1900
                \hskip\@ACM@badge@skip
              \fi
1901
```

```
\ifx\@acmBadgeR@image\@empty\else
             1902
                             \href{\@acmBadgeR@url}{%
             1903
                               \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
             1904
                           \fi}%
             1905
                     \fi
             1906
             1907
                   \fi
             1908 }
  \@mktitle The title of the article
             1909 \def\@mktitle{%
                   \ifcase\ACM@format@nr
                   \relax % manuscript
                     \@mktitle@i
             1912
                   \or % acmsmall
             1913
                     \@mktitle@i
             1914
                   \or % acmlarge
             1915
                     \@mktitle@i
             1916
             1917
                   \or % acmtog
                     \@mktitle@i
             1918
             1919
                   \or % sigconf
                     \@mktitle@iii
             1920
                   \or % siggraph
             1921
                     \@mktitle@iii
             1922
             1923
                   \or % sigplan
             1924
                     \@mktitle@iii
                   \or % sigchi
             1925
                     \@mktitle@iii
             1926
                   \or % sigchi-a
             1927
                     \@mktitle@iv
             1928
                   \fi
             1929
             1930 }
\@titlefont The font to typeset the title
             1931 \def\@titlefont{%
                   \ifcase\ACM@format@nr
             1932
             1933
                   \relax % manuscript
                     \LARGE\sffamily\bfseries
             1934
                   \or % acmsmall
             1935
                     \LARGE\sffamily\bfseries
             1936
                   \or % acmlarge
             1937
                     \LARGE\sffamily\bfseries
             1938
                   \or % acmtog
             1939
             1940
                     \Huge\sffamily
                   \or % sigconf
             1941
                     \Huge\sffamily\bfseries
             1942
                   \or % siggraph
             1943
                     \Huge\sffamily\bfseries
             1944
                   \or % sigplan
             1945
             1946
                     \Huge\bfseries
                   \or % sigchi
```

```
\Huge\sffamily\bfseries
               1948
                     \or % sigchi-a
               1949
                        \Huge\bfseries
               1950
                     \fi}
               1951
\@subtitlefont The font to typeset the subtitle
               1952 \def\@subtitlefont{\normalsize
                     \ifcase\ACM@format@nr
               1953
                     \relax % manuscript
               1954
               1955
                       \mdseries
               1956
                     \or % acmsmall
                       \mdseries
                     \or % acmlarge
               1958
                       \mdseries
               1959
                     \or % acmtog
               1960
                        \LARGE
               1961
                     \or % sigconf
               1962
                        \LARGE\mdseries
               1963
                     \or % siggraph
               1964
                        \LARGE\mdseries
               1965
                     \or % sigplan
               1966
                        \LARGE\mdseries
               1967
               1968
                     \or % sigchi
               1969
                        \LARGE\mdseries
               1970
                     \or % sigchi-a
                        \mdseries
               1971
                     \fi}
               1972
               The version of \mktitle for most journals
  \@mktitle@i
               1973 \def\@mktitle@i{\hsize=\textwidth
                     \@ACM@title@width=\hsize
                     \ifx\@acmBadgeL@image\@empty\else
               1975
                       \advance\@ACM@title@width by -\@ACM@badge@width
               1976
                       \advance\@ACM@title@width by -\@ACM@badge@skip
               1977
                     \fi
               1978
                     \ifx\@acmBadgeR@image\@empty\else
                       \advance\@ACM@title@width by -\@ACM@badge@width
               1980
                       \advance\@ACM@title@width by -\@ACM@badge@skip
               1981
               1982
                     \setbox\mktitle@bx=\vbox{\noindent\@titlefont
               1983
                       1984
                         \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
               1985
                             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
               1986
                         \hskip\@ACM@badge@skip
               1987
               1988
                       \parbox[t]{\@ACM@title@width}{\raggedright
               1989
                         \@titlefont\noindent
               1990
                         \@title
               1991
               1992
                     \ifx\@subtitle\@empty\else
                       \par\noindent{\@subtitlefont\@subtitle}
```

```
\fi}%
             1994
                  \ifx\@acmBadgeR@image\@empty\else
             1995
                    \hskip\@ACM@badge@skip
             1996
                    1997
                        \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
             1998
             1999
                  \fi
             2000
                  \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.
             2001 \def\@mktitle@iii{\hsize=\textwidth
                    \setbox\mktitle@bx=\vbox{\@titlefont\centering
             2002
                      \@ACM@title@width=\hsize
             2003
                      \if@ACM@badge
             2004
                        \verb|\advance|@ACM@title@width| by -2\\@ACM@badge@width|
             2005
                        \advance\@ACM@title@width by -2\@ACM@badge@skip
             2006
                        \parbox[b]{\@ACM@badge@width}{\strut
             2007
                          \ifx\@acmBadgeL@image\@empty\else
             2008
                            2009
             2010
                             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
             2011
                          \fi}%
                        \hskip\@ACM@badge@skip
             2012
             2013
                      \parbox[t]{\@ACM@title@width}{\centering\@titlefont
             2014
                        \@title
             2015
                        \ifx\@subtitle\@empty\else
             2016
                          \par\noindent{\@subtitlefont\@subtitle}
             2017
                        \fi
             2018
                      }%
             2019
             2020
                      \if@ACM@badge
                        \hskip\@ACM@badge@skip
             2021
                        \parbox[b]{\@ACM@badge@width}{\strut
             2022
                          \ifx\@acmBadgeR@image\@empty\else
             2023
                            2024
             2025
                             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
             2026
                          \fi}%
                      \fi
             2027
                      \par\bigskip}}%
             2028
\@mktitle@iv The version of \@mktitle for sigchi-a
             2029 \def\@mktitle@iv{\hsize=\textwidth}
                    \setbox\mktitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
             2030
                      \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
             2031
                      \noindent\@title
             2032
                     \ifx\@subtitle\@empty\else
             2033
             2034
                       \par\noindent\@subtitlefont\@subtitle
             2035
                     \fi
```

```
2036 \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.

```
2037 \newbox\@ACM@commabox
              2038 \def\@ACM@addtoaddress#1{%
                   \ifvmode\else
              2039
                      \if@ACM@affiliation@obeypunctuation\else
                      \setbox\@ACM@commabox=\hbox{, }%
                      \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
              2042
                   \fi\fi
              2043
                   #1}
              2044
 \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
               \affiliation. Of course we can make them produce an error message, but...
   \department
\streetaddress 2045 \def\streetaddress#1{\unskip\ignorespaces}
        \city 2046 \def\postcode#1{\unskip\ignorespaces}
       \state 2047 \if@ACM@journal
                   \def\position#1{\unskip\ignorespaces}
     \postcode 2048
                    \def\institution#1{\unskip~#1\ignorespaces}
     \country ^{2049}
                    \def\city#1{\unskip\ignorespaces}
                   \def\state#1{\unskip\ignorespaces}
                   \newcommand\department[2][0]{\unskip\ignorespaces}
              2053 \def\country#1{\if@ACM@affiliation@obeypunctuation\else, \fi#1\ignorespaces}
                    \def\position#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
              2055
                    \def\institution#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
              2056
                    2057
                      #2\else#2\par\fi}%
              2058
              2059% \def\streetaddress#1{\left(\frac{6ACM@affiliation@obeypunctuation#1\else#1\pi}\right)}
                    \let\city\@ACM@addtoaddress
                    \let\state\@ACM@addtoaddress
              2062% \def\postcode#1{\if@ACM@affiliation@obeypunctuation#1\else\unskip\space#1\fi}%
                   \let\country\@ACM@addtoaddress
              2064\fi
  \@mkauthors Typesetting the authors
              2065 \def\@mkauthors{\begingroup
                   \hsize=\textwidth
              2067
                    \ifcase\ACM@format@nr
              2068
                    \relax % manuscript
                      \@mkauthors@i
              2069
```

```
\@mkauthors@i
                   2071
                         \or % acmlarge
                   2072
                           \@mkauthors@i
                   2073
                   2074
                         \or % acmtog
                   2075
                           \@mkauthors@i
                   2076
                         \or % sigconf
                           \@mkauthors@iii
                   2077
                        \or % siggraph
                   2078
                           \@mkauthors@iii
                   2079
                        \or % sigplan
                   2080
                   2081
                           \@mkauthors@iii
                         \or % sigchi
                   2082
                           \@mkauthors@iii
                   2083
                         \or % sigchi-a
                   2084
                           \@mkauthors@iv
                   2085
                        \fi
                   2086
                         \endgroup
                   2087
                   2088 }
     \@authorfont Somehow different conferences use different fonts for author names. Why?
                   2089 \def\@authorfont{\Large\sffamily}
\@affiliationfont Font for affiliations
                   2090 \def\@affiliationfont{\normalsize\normalfont}
                        Adjusting fonts for different formats
                   2091 \ifcase\ACM@format@nr
                   2092 \relax % manuscript
                   2093 \or % acmsmall
                        \def\@authorfont{\large\sffamily}
                        \def\@affiliationfont{\small\normalfont}
                   2096 \or % acmlarge
                   2097 \or % acmtog
                         \def\@authorfont{\LARGE\sffamily}
                   2098
                        \def\@affiliationfont{\large}
                   2099
                   2100 \or % sigconf
                        \def\@authorfont{\LARGE}
                   2101
                        \def\@affiliationfont{\large}
                   2102
                   2103 \or % siggraph
                        \def\@authorfont{\normalsize\normalfont}
                   2104
                        \def\@affiliationfont{\normalsize\normalfont}
                   2105
                   2106 \or % sigplan
                        \def\@authorfont{\Large\normalfont}
                        \def\@affiliationfont{\normalsize\normalfont}
                   2109 \or % sigchi
                   2110 \def\@authorfont{\bfseries}
                        \def\@affiliationfont{\mdseries}
                   2112 \or % sigchi-a
```

\or % acmsmall

2070

```
2113 \def\@authorfont{\bfseries}
2114 \def\@affiliationfont{\mdseries}
2115 \fi

\@typeset@author@line At this point we have \@currentauthors and \@currentaffiliations. We typeset them in the journal style
```

2116 \def\@typeset@author@line{%
2117 \andify\@currentauthors\par\noindent
2118 \@currentauthors\def\@currentauthors{}%
2119 \ifx\@currentaffiliations\@empty\else
2120 \andify\@currentaffiliations
2121 \unskip, {\@currentaffiliations}\par
2122 \fi
2123 \def\@currentaffiliations{}}

\@mkauthors@i This version is used in most journal formats. Note that \and between authors with the same affiliation becomes \_and\_:

```
2124 \def\@mkauthors@i{%
     \def\@currentauthors{}%
2125
     \def\@currentaffiliations{}%
     \global\let\and\@typeset@author@line
     \def\@author##1{%
2128
       \ifx\@currentauthors\@empty
2129
          \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
2130
       \else
2131
           \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
2132
2133
       \fi
       2134
     \def\email##1##2{}%
2135
     \def\affiliation##1##2{%
2136
       \def\@tempa{\##2}\ifx\@tempa\@empty\else
2137
           \ifx\@currentaffiliations\@empty
2138
              \gdef\@currentaffiliations{%
2139
                \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2140
                \setkeys{@ACM@affiliation@}{##1}%
2141
                \@affiliationfont##2}%
2142
          \else
2143
             \g@addto@macro{\@currentaffiliations}{\and
2144
               \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2145
               \setkeys{@ACM@affiliation@}{##1}##2}%
2146
2147
         \fi
2148
        \global\let\and\@typeset@author@line}%
2149
     \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
2150
       \noindent\addresses\@typeset@author@line
2151
      \par\medskip}%
2152
2153 }
```

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

```
\author@bx The box to put an individual author in
                    2154 \newbox\author@bx
      \author@bx@wd
                    The width of the author box
                    2155 \newdimen\author@bx@wd
     \author@bx@sep The separation between author boxes
                    2156 \newskip\author@bx@sep
                    2157 \author@bx@sep=1pc\relax
\@typeset@author@bx Typesetting the box with authors. Note that in sigchi-a the box is not centered.
                    2158 \def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd
                    2159
                          \def\and{\par}\normalbaselines
                          \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
                    2160
                            \@authorfont\@currentauthors\par\@affiliationfont
                    2161
                            \@currentaffiliation}\egroup
                    2162
                          \box\author@bx\hspace{\author@bx@sep}%
                    2163
                          \gdef\@currentauthors{}%
                    2164
```

\gdef\@currentaffiliation{}}

\@mkauthors@iii The sigconf version. Here we use a centered design with each author in a separate box. 2166 \def\@mkauthors@iii{%

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.

```
2167
     \author@bx@wd=\textwidth\relax
2168
     \advance\author@bx@wd by -\author@bx@sep\relax
2169
     \ifnum\@ACM@authorsperrow>0\relax
       \divide\author@bx@wd by \@ACM@authorsperrow\relax
2170
2171
     \else
2172
       \ifcase\num@authorgroups
2173
       \relax % 0?
       \or % 1=one author per row
2174
2175
       \or % 2=two authors per row
          \divide\author@bx@wd by \num@authorgroups\relax
2176
       \or % 3=three authors per row
2177
          \divide\author@bx@wd by \num@authorgroups\relax
2178
       \or % 4=two authors per row (!)
2179
          \divide\author@bx@wd by 2\relax
2180
2181
       \else % three authors per row
          \divide\author@bx@wd by 3\relax
2182
       \fi
2183
     \fi
2184
     \advance\author@bx@wd by -\author@bx@sep\relax
2185
Now, parsing of \addresses:
     \gdef\@currentauthors{}%
```

```
\gdef\@currentaffiliation{}%
2187
     \def\@author##1{\ifx\@currentauthors\@empty
2188
       \gdef\@currentauthors{\par##1}%
2189
     \else
2190
       \g@addto@macro\@currentauthors{\par##1}%
2191
     \fi
2192
2193
     \def\email##1##2{\ifx\@currentaffiliation\@empty
2194
       \gdef\@currentaffiliation{\bgroup
2195
          \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2196
2197
     \else
       \g@addto@macro\@currentaffiliation{\par\bgroup
2198
          \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2199
2200
     \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2201
       \gdef\@currentaffiliation{%
2202
          \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2203
          \setkeys{@ACM@affiliation@}{##1}##2}%
2204
2205
     \else
2206
       \g@addto@macro\@currentaffiliation{\par
          \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2207
          \setkeys{@ACM@affiliation@}{##1}##2}%
2208
2209
     \global\let\and\@typeset@author@bx
2210
2211 }%
 Actual typesetting is done by the \and macro:
     \hsize=\textwidth
2212
     \global\setbox\mktitle@bx=\vbox{\noindent
2213
       \box\mktitle@bx\par\medskip\leavevmode
2214
2215
       \lineskip=1pc\relax\centering\hspace*{-1em}%
       \addresses\let\and\@typeset@author@bx\and\par\bigskip}}
2216
```

\@mkauthors@iv

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

```
2217 \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
2218
     \advance\author@bx@wd by -\author@bx@sep\relax
2219
     \ifnum\@ACM@authorsperrow>0\relax
       \divide\author@bx@wd by \@ACM@authorsperrow\relax
2221
     \else
2222
       \ifcase\num@authorgroups
2223
       \relax % 0?
2224
       \or % 1=one author per row
2225
       \else % 2=two authors per row
2226
```

```
\fi
                      2228
                            \fi
                      2229
                            \advance\author@bx@wd by -\author@bx@sep\relax
                      2230
                       Now, parsing of \addresses:
                            \gdef\@currentauthors{}%
                      2231
                            \gdef\@currentaffiliation{}%
                      2232
                            \def\@author##1{\ifx\@currentauthors\@empty
                              \gdef\@currentauthors{\par##1}%
                            \else
                      2235
                              \g@addto@macro\@currentauthors{\par##1}%
                      2236
                            \fi
                      2237
                            \gdef\and{}}%
                      2238
                            \def\email##1##2{\ifx\@currentaffiliation\@empty
                      2239
                              \gdef\@currentaffiliation{\nolinkurl{##2}}%
                      2240
                            \else
                      2241
                              \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
                      2242
                            \fi}%
                      2243
                            \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
                      2244
                              \gdef\@currentaffiliation{%
                      2245
                                \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
                      2246
                                     \setkeys{@ACM@affiliation@}{##1}##2}%
                      2247
                      2248
                            \else
                              \g@addto@macro\@currentaffiliation{\par
                      2249
                                \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
                      2250
                                \setkeys{@ACM@affiliation@}{##1}##2}%
                      2251
                            \fi
                      2252
                            \global\let\and\@typeset@author@bx}%
                      2253
                      2254 %
                       Actual typesetting is done by the \and macro
                              \bgroup\hsize=\columnwidth
                      2255
                              \par\raggedright\leftskip=\z@
                      2256
                              \lineskip=1pc\noindent
                      2257
                              \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}
                      2258
\@mkauthorsaddresses
                       Typesetting authors' addresses in the footnote style
                      2259 \def\@mkauthorsaddresses{%
                            \ifnum\num@authors>1\relax
                      2260
                            Authors' \else Author's \fi
                      2261
                      2262
                            \ifnum\num@authorgroups>1\relax
                            addresses: \else address: \fi
                      2263
                            \bgroup
                      2264
                            \def\streetaddress##1{\unskip, ##1}%
                      2265
                      2266
                            \def\postcode##1{\unskip, ##1}%
                      2267
                            \def\position##1{\unskip\ignorespaces}%
                      2268
                            \def\institution##1{\unskip, ##1}%
                            \def\city##1{\unskip, ##1}%
                      2269
                            \def\state##1{\unskip, ##1}%
                      2270
```

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

2227

```
\renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
                  2271
                        \def\country##1{\unskip, ##1}%
                  2272
                       \def\and{\unskip; }%
                  2273
                       \def\@author##1{##1}%
                  2274
                       \def\email##1##2{\unskip, \nolinkurl{##2}}%
                  2275
                       \addresses
                  2276
                  2277
                       \egroup}
                  2278 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@journal
                  2279
                       \ifx\@authorsaddresses\@emptv
                       \ClassWarningNoLine{\@classname}{Authors'
                  2280
                         addresses are mandatory for ACM journals}%
                  2281
                       \fi\fi\fi}
                  2282
   \@setaddresses This is an amsart macro that we do not need.
                  2283 \def\@setaddresses{}
 \@authornotemark Adding a footnote mark to authors. This version adds a "normal" footnote mark.
                  \@@authornotemark Adding a footnote mark to authors with a given number
                  2285 \def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}
      \@mkteasers Typesetting the teasers
                  2286 \def\@mkteasers{%
                       \ifx\@teaserfigures\@empty\else
                  2287
                  2288
                         \def\@teaser##1{\par\bigskip\bgroup
                  2289
                            \captionsetup{type=figure}##1\egroup\par}
                          \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
                  2290
                            \noindent\@Description@presentfalse
                  2291
                            \@teaserfigures\par\if@Description@present\else
                  2292
                               \global\@undescribed@imagestrue
                  2293
                  2294
                               \ClassWarning{\@classname}{A possible image without
                  2295
                                description}\fi
                  2296
                          \medskip}%
                  2297
                       \fi}
     \@mkabstract Typesetting the abstract
                  2298 \def\@mkabstract{\bgroup
                       \ifx\@abstract\@lempty\else
                       {\bf \{hantomsection \ add contents line \{toc\} \{section\} \{Abstract\} \%}
                  2300
                         \if@ACM@journal
                  2301
                  2302
                             \everypar{\setbox\z@\lastbox\everypar{}}\small
                  2303
                          \else
                           \section*{\abstractname}%
                  2304
                  2305
                        \ignorespaces\@abstract\par}%
                  2306
                  2307
                       \fi\egroup}
```

```
\@mkbibcitation Print the bibcitation format
                                               2308 \def\@mkbibcitation{\bgroup
                                                          \let\@vspace\@vspace@orig
                                               2309
                                                          \let\@vspacer\@vspacer@orig
                                               2310
                                               2311
                                                         \def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%
                                                          \def\footnotemark{}%
                                               2313
                                                          \def\\{\unskip{} \ignorespaces}%
                                                          \def\footnote{\ClassError{\@classname}{Please do not use footnotes
                                               2314
                                                                   inside a \string\title{} or \string\author{} command! Use
                                               2315
                                                                   \string\titlenote{} or \string\authornote{} instead!}}%
                                               2316
                                               2317
                                                          \def\@article@string{\ifx\@acmArticle\@empty{\ }\else,
                                                              Article \@acmArticle \ \fi}%
                                               2318
                                                          \par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak
                                               2319
                                                          \noindent\bgroup
                                               2320
                                                               \def\\{\unskip{}, \ignorespaces}\authors\egroup. \@acmYear. \@title
                                               2321
                                                          \ifx\@subtitle\@empty. \else: \@subtitle. \fi
                                               2322
                                                          \if@ACM@nonacm\else
                                               2323
                                               2324
                                                              % The 'nonacm' option disables 'printacmref' by default,
                                                              % and the present \@mkbibcitation definition is never used
                                                              % in this case. The conditional remains useful if the user
                                               2326
                                                              % explicitly sets \settopmatter{printacmref=true}.
                                               2327
                                                              \if@ACM@journal@bibstrip
                                               2328
                                                                     \textit{\@journalNameShort}
                                               2329
                                                                     \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
                                               2330
                                                                     \ref{TotPages}~\@pages@word.
                                               2331
                                                              \else
                                               2332
                                                                     In \textit{\@acmBooktitle}%
                                               2333
                                                                     \ifx\@acmEditors\@empty\textit{.}\else
                                               2334
                                                                         \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
                                               2335
                                                                     \fi\
                                               2336
                                               2337
                                                                     ACM, New York, NY, USA%
                                                                         \@article@string\unskip, \ref{TotPages}~\@pages@word.
                                               2338
                                                              \fi
                                               2339
                                                          \fi
                                               2340
                                                          \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
                                               2341
                                               2342 \par\egroup}
    2343 \def\@printendtopmatter{\bgroup
                                               2344 \let\@vspace\@vspace@orig
                                                          \let\@vspacer\@vspacer@orig
                                               2346
                                                          \par\bigskip
                                                          \egroup}
                     \@setthanks We redefine \setthanks using \long
                                               2348 \end{array} $$ 2348
\@setauthorsaddresses
```

2349 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}

#### 3.16 Headers and Footers

```
We use fancyhdr for our headers and footers:
                                                      2350 \RequirePackage{fancyhdr}
\ACM@restore@pagestyle The following code by Ross Moore protects against changes by the totpages package:
                                                      2351 \let\ACM@ps@plain\ps@plain
                                                      2352 \let\ACM@ps@myheadings\ps@myheadings
                                                      2353 \let\ACM@ps@headings\ps@headings
                                                      2354 \def\ACM@restore@pagestyle{%
                                                                 \let\ps@plain\ACM@ps@plain
                                                                 \let\ps@myheadings\ACM@ps@myheadings
                                                      2356
                                                                 \let\ps@headings\ACM@ps@headings}
                                                      2357
                                                      2358 \AtBeginDocument{\ACM@restore@pagestyle}
           \ACM@linecount@bx This is the box displayed in review mode
                                                      2359 \if@ACM@review
                                                                  \newsavebox{\ACM@linecount@bx}
                                                      2360
                                                      2361
                                                                  \newlength\ACM@linecount@bxht
                                                      2362
                                                                  \newcount\ACM@linecount
                                                                  \ACM@linecount\@ne\relax
                                                      2363
                                                                  \def\ACM@mk@linecount{%
                                                      2364
                                                                       2365
                                                                                \normalsize
                                                      2366
                                                                                \setlength{\ACM@linecount@bxht}{0pt}%
                                                      2367
                                                                                \label{loop{color{red}\scriptsize} \label{loop{color{red}\scriptsize}} \label{loop{color{red}\script
                                                      2368
                                                                                \global\advance\ACM@linecount by \@ne
                                                      2369
                                                                                \addtolength{\ACM@linecount@bxht}{\baselineskip}%
                                                      2370
                                                                                \ifdim\ACM@linecount@bxht<\textheight\repeat
                                                      2371
                                                                                {\color{red}\scriptsize\the\ACM@linecount}\hfill
                                                      2372
                                                                                \global\advance\ACM@linecount by \@ne}}}
                                                      2373
                                                      2374\fi
                \ACM@linecountL How to display the box on the left
                                                      2375 \def\ACM@linecountL{%
                                                                 \if@ACM@review
                                                      2376
                                                      2377
                                                                  \ACM@mk@linecount
                                                                  \begin{picture}(0,0)%
                                                      2378
                                                                      \put(-26,-22){\usebox{\ACM@linecount@bx}}%
                                                                 \end{picture}%
                                                      2380
                                                                 \fi}
                                                      2381
                \ACM@linecountR How to display the box on the right
                                                      2382 \def\ACM@linecountR{%
                                                                 \if@ACM@review
                                                      2383
                                                                  \ACM@mk@linecount
                                                      2384
                                                                  \begin{picture}(0,0)%
                                                      2385
                                                                       \put(20,-22){\usebox{\ACM@linecount@bx}}%
                                                      2386
```

2387

2388

\fi}

\end{picture}%

```
\ACM@timestamp The timestamp system
                   2389 \if@ACM@timestamp
                        % Subtracting 30 from \time gives us the effect of rounding down despite
                         % \numexpr rounding to nearest
                   2391
                   2392
                         \newcounter{ACM@time@hours}
                         \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
                         \newcounter{ACM@time@minutes}
                   2394
                        \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
                   2395
                         \newcommand\ACM@timestamp{%
                   2396
                           \footnotesize%
                   2397
                           \ifx\@acmSubmissionID\@empty\relax\else
                   2398
                           Submission ID: \@acmSubmissionID.{ }%
                   2399
                   2400
                           \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
                   2401
                           \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
                   2402
                           Page \thepage\ of \@startPage--\pageref*{TotPages}.%
                   2403
                   2404 }
                   2405 \fi
   \@shortauthors Even if the author redefined \shortauthors, we do not print it in the headers when in
                    anonymous mode:
                   2406 \ensuremath{\mbox{def}\ensuremath{\mbox{@shortauthors}}\xspace}\%
                        \if@ACM@anonymous
                   2407
                   2408
                           Anon.
                           \ifx\@acmSubmissionID\@empty\else Submission Id: \@acmSubmissionID\fi
                        \else\shortauthors\fi}
   \@headfootfont The font to typeset header and footer text.
                   2411 \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
                   2412 \AtBeginDocument{%
                   2413 \fancypagestyle{standardpagestyle}{%
                       \fancyhf{}%
                         \renewcommand{\headrulewidth}{\z@}%
                   2415
                         \renewcommand{\footrulewidth}{\z@}%
                   2416
                         \def\@acmArticlePage{%
                   2417
                           \ifx\@acmArticle\empty%
                   2418
                             \if@ACM@printfolios\thepage\fi%
                   2419
                   2420
                           \else%
                             \@acmArticle\if@ACM@printfolios:\thepage\fi%
                   2421
                   2422
                   2423
                         \if@ACM@journal@bibstrip
                   2424
                           \ifcase\ACM@format@nr
                   2425
                           \relax % manuscript
                   2426
                             \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
                   2427
                             \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
                   2428
                             \fancyhead[RE]{\@shortauthors}%
                   2429
```

```
\fancyhead[LO]{\ACM@linecountL\shorttitle}%
2430
         \if@ACM@nonacm\else%
2431
            \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}
2432
          \fi%
2433
       \or % acmsmall
2434
         \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticlePage}%
2435
2436
         \fancyhead[RO]{\@headfootfont\@acmArticlePage}%
2437
         \fancyhead[RE]{\@headfootfont\@shortauthors}%
         \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2438
         \if@ACM@nonacm\else%
2439
         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2440
           \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2441
         \fi
2442
       \or % acmlarge
2443
         \fancyhead[LE]{\ACM@linecountL\@headfootfont
2444
         \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2445
         \fancyhead[L0]{\ACM@linecountL}%
2446
         \fancyhead[RO]{\@headfootfont
2447
           \shorttitle\quad\textbullet\quad\@acmArticlePage}%
2448
2449
         \if@ACM@nonacm\else%
         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2450
           \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2451
         \fi
2452
       \or % acmtog
2453
         \fancyhead[LE]{\ACM@linecountL\@headfootfont
2454
            \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2455
          \fancyhead[LO]{\ACM@linecountL}%
2456
         \fancyhead[RE]{\ACM@linecountR}%
2457
         \fancyhead[R0]{\@headfootfont
2458
            \shorttitle\quad\textbullet\quad\@acmArticlePage\ACM@linecountR}%
2459
2460
         \if@ACM@nonacm\else%
         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2461
2462
           \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
         \fi
2463
       \else % Proceedings
2464
         \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2465
         \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2466
         \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2467
         \if@ACM@nonacm\else%
           \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
2469
2470
              \acmConference@shortname,
              \acmConference@date, \acmConference@venue}%
2471
           \footnotemark
2472
              \acmConference@shortname,
2473
2474
              \acmConference@date, \acmConference@venue\ACM@linecountR}%
2475
         \fi
2476
       \fi
2477
     \else % Proceedings
       \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2478
       \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2479
```

```
\fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
                                                                2480
                                                                                              \if@ACM@nonacm\else%
                                                                2481
                                                                                                     \fancyhead[LE]{\ACM@linecountL\@headfootfont
                                                                2482
                                                                                                             \acmConference@shortname,
                                                                2483
                                                                                                             \acmConference@date, \acmConference@venue}%
                                                                2484
                                                                2485
                                                                                                      \fancyhead[RO]{\@headfootfont
                                                                2486
                                                                                                             \acmConference@shortname,
                                                                                                             \acmConference@date, \acmConference@venue\ACM@linecountR}%
                                                                2487
                                                                                             \fi
                                                                2488
                                                                                     \fi
                                                                2489
                                                                                     \if@ACM@sigchiamode
                                                                2490
                                                                                                 \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
                                                                2491
                                                                2492
                                                                                     \if@ACM@timestamp
                                                                2493
                                                                                                 \fancyfoot[LO,RE]{\ACM@timestamp}
                                                                2494
                                                                                    \fi
                                                                2495
                                                                2496 }%
                                                                2497 \pagestyle{standardpagestyle}
                    \@folio@wd Folio blob width, height, offsets and max number
                    \ensuremath{$\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensure
\ensuremath{$\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{$}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensuremath{}\ensure
                \@folio@max 2501 \newdimen\@folio@ht
                                                                2502 \@folio@ht=\z@
                                                                2503 \newdimen\@folio@voffset
                                                                2504 \@folio@voffset=\z@
                                                                2505 \def\@folio@max{1}
                                                                2506 \ifcase\ACM@format@nr
                                                                2507 \relax % manuscript
                                                                2508 \or % acmsmall
                                                                2509 \@folio@wd=45.75pt\relax
                                                                                    \@folio@ht=1.25in\relax
                                                                2510
                                                                                     \@folio@voffset=.2in\relax
                                                                                    \def\@folio@max{8}
                                                                2513 \or % acmlarge
                                                                2514 \@folio@wd=43.25pt\relax
                                                                2515 \@folio@ht=79pt\relax
                                                                2516 \@folio@voffset=.55in\relax
                                                                2517 \def\@folio@max{10}
                                                                2518\fi
               \@folioblob The macro to typeset the folio blob.
                                                                2519 \def\@folioblob{\@tempcnta=0\@acmArticleSeg\relax
                                                                                    \ifnum\@tempcnta=0\relax\else
                                                                    First, we calculate \@acmArticleSeq modulo \@folio@max
                                                                2521
                                                                2522
                                                                                                  \ifnum\@tempcnta>\@folio@max\relax
                                                                                                     \advance\@tempcnta by - \@folio@max
                                                                2523
```

```
\repeat
                                   2524
                                                    \advance\@tempcnta by -1\relax
                                   2525
                                                    \@tempdima=\@folio@ht\relax
                                   2526
                                                    \multiply\@tempdima by \the\@tempcnta\relax
                                   2527
                                                    \advance\@tempdima by -\@folio@voffset\relax
                                   2528
                                   2529
                                                    \begin{picture}(0,0)
                                                    \mbox[\z@]{\raisebox{-}@tempdima}{\%}
                                   2530
                                   2531
                                   2532
                                                                   \raisebox{-0.45\@folio@ht}[\z@][\z@]{%
                                                                       \left( \frac{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath
                                   2533
                                                             \parbox{\@folio@wd}{%
                                   2534
                                   2535
                                                                  \centering
                                                                   \textcolor{white}{\LARGE\sffamily\bfseries\@acmArticle}}}
                                   2536
                                                \end{picture}\fi}
                                   2537
                                   2538
firstpagestyle The page style for the first page only.
                                   2539 \AtBeginDocument{%
                                   2540 \fancypagestyle{firstpagestyle}{%
                                   2541
                                               \fancyhf{}%
                                               \renewcommand{\headrulewidth}{\z@}%
                                   2542
                                                \renewcommand{\footrulewidth}{\z@}%
                                                \if@ACM@journal@bibstrip
                                   2544
                                                    \ifcase\ACM@format@nr
                                   2545
                                                    \relax % manuscript
                                   2546
                                                         \fancyhead[L]{\ACM@linecountL}%
                                   2547
                                                         \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
                                   2548
                                   2549
                                                         \if@ACM@nonacm\else%
                                                             \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
                                   2550
                                   2551
                                                         \fi%
                                                    \or % acmsmall
                                   2552
                                                         \if@ACM@nonacm\else%
                                   2553
                                                        \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
                                   2554
                                                             \@acmNumber, Article \@acmArticle. Publication date:
                                   2555
                                                             \@acmPubDate.}%
                                   2557
                                                         \fancyhead[LE]{\ACM@linecountL\@folioblob}%
                                   2558
                                                         \fancyhead[L0]{\ACM@linecountL}%
                                   2559
                                                         \fancyhead[RO]{\@folioblob}%
                                   2560
                                                         \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
                                   2561
                                   2562
                                                    \or % acmlarge
                                                         \if@ACM@nonacm\else%
                                   2563
                                   2564
                                                       \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
                                                             \@acmNumber, Article \@acmArticle. Publication date:
                                   2565
                                                             \@acmPubDate.}%
                                   2566
                                                         \fi%
                                   2567
                                                         \fancyhead[RO]{\@folioblob}%
                                   2568
                                                         \fancyhead[LE]{\ACM@linecountL\@folioblob}%
                                   2569
                                                         \fancyhead[LO]{\ACM@linecountL}%
                                   2570
```

```
\fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2571
        \or % acmtog
2572
          \if@ACM@nonacm\else%
2573
         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2574
            \@acmNumber, Article \@acmArticle. Publication date:
2575
            \@acmPubDate.}%
2576
2577
          \fi%
          \fancyhead[L]{\ACM@linecountL}%
2578
          \fancyhead[R]{\ACM@linecountR}%
2579
        \else % Conference proceedings
2580
          \fancyhead[L]{\ACM@linecountL}%
2581
          \fancyhead[R]{\ACM@linecountR}%
          \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2583
2584
     \else
2585
       \fancyhead[L]{\ACM@linecountL}%
2586
       \fancyhead[R]{\ACM@linecountR}%
2587
       \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2588
2589
2590
     \if@ACM@timestamp
        \ifnum\ACM@format@nr=0\relax % Manuscript
2591
        \fancyfoot[LO,RE]{\ACM@timestamp\quad
2592
          \if@ACM@nonacm\else
2593
            \footnotesize Manuscript submitted to ACM
2594
2595
          \fi}
        \else
2596
        \fancyfoot[LO,RE]{\ACM@timestamp}
2598
     \fi
2599
2600 }}
```

## 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.

```
2601 \def\ACM@NRadjust#1{%
2602 \begingroup
     \expandafter\ifx\csname Sectionformat\endcsname\relax
2603
     % do nothing when \Sectionformat is unknown
2604
      \def\next{\endgroup #1}%
2605
2606
    \else
     \def\next{\endgroup
2607
      \let\realSectionformat\Sectionformat
2608
      \def\ACM@sect@format@{#1}%
2609
      \let\Sectionformat\ACM@NR@adjustedSectionformat
2610
2611 %% next lines added 2018-06-17 to ensure section number is styled
      \let\real@adddotafter\@adddotafter
2612
      2613
      #1{}% imposes the styles, but nullifies \MakeUppercase
2614
2615
      \let\@adddotafter\real@adddotafter
2616 }%
2617 \fi \next
2618 }
2620 \realSectionformat{\ACM@sect@format{#1}}{#2}%
2621 \let\Sectionformat\realSectionformat}
2622 \DeclareRobustCommand{\ACM@sect@format}{\ACM@sect@format@}
2623 \def\ACM@sect@format@null#1{#1}
2624 \let\ACM@sect@format@\ACM@sect@format@null
2625 \AtBeginDocument{%
2626 \expandafter\ifx\csname LTX@adddotafter\endcsname\relax
     \let\LTX@adddotafter\@adddotafter
2628 \fi
2629 }
2630 \ def\ ACM@adddotafter \#1 \{ ifx relax \#1 relax \ else \ LTX @adddotafter \#1 \} \ fi \}
    Sectioning is different for different levels
2631 \renewcommand\section{\@startsection{section}{1}{\z@}%
2632 {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2633 {.25\baselineskip}%
2634 {\ACM@NRadjust\@secfont}}
2635 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2636 {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
     {.25\baselineskip}%
2637
    {\ACM@NRadjust\@subsecfont}}
2638
```

\ACM@NR@adjustedSectionformat

\ACM@adddotafter

```
2639 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
                                                                            \{-.5\baselineskip \eqrup -2\p@ \eqrup -.2\p@}%
                                                                           \{-3.5\p@\}\%
                                                             2641
                                                                          {\ACM@NRadjust{\@subsubsecfont\@adddotafter}}}
                                                             2643 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
                                                                           \{-.5\baselineskip \eqrup -2\p@ \eqrup -.2\p@}%
                                                                            \{-3.5\p0\}\%
                                                             2645
                                                                            {\ACM@NRadjust{\@parfont\@adddotafter}}}
                                                             2646
                                                             2647
                                                             2648 \renewcommand\part{\@startsection{part}{9}{\z@}%
                                                                             {-10\p@ \ensuremath{\mbox{\mbox{$0$}}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensuremath{\mbox{$0$}}\ensu
                                                             2649
                                                                             {4\p@}%
                                                             2650
                                                                            {\ACM@NRadjust\@parfont}}
\section@raggedright Special version of \raggedright compatible with \MakeUppercase
                                                             2653 \rightskip\@rightskip
                                                             2654 \leftskip\z@skip
                                                             2655 \parindent\z@}
                                \@secfont Fonts for sections etc. are different for different formats.
                       \verb|\descfont| 2656 \texttt| def \texttt| escfont{\sffamily bfseries } section \texttt| eragged right \texttt| Make Text Upper case \} | the total content of th
              \@subsubsecfont 2657 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
                                \@parfont 2658 \def\@subsubsecfont{\sffamily\itshape}
                                                             2659 \def\@parfont{\itshape}
                                                             2660 \setcounter{secnumdepth}{3}
                                                             2661 \ifcase\ACM@format@nr
                                                             2662 \relax % manuscript
                                                             2663 \or % acmsmall
                                                             2664 \or % acmlarge
                                                             2665 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
                                                             2666 \def\@subsecfont{\sffamily\large\section@raggedright}
                                                             2667 \or % acmtog
                                                             2668 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
                                                             2669 \def\@subsecfont{\sffamily\large\section@raggedright}
                                                             2670 \or % sigconf
                                                             2671 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
                                                             2672 \def\@subsecfont{\bfseries\Large\section@raggedright}
                                                             2673 \or % siggraph
                                                             2674 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
                                                             2675 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}
                                                             2676 \or % sigplan
                                                             2677 \def\@secfont{\bfseries\Large\section@raggedright}
                                                             2678 \def\@subsecfont{\bfseries\section@raggedright}
                                                             2679 \def\@subsubsecfont{\bfseries\section@raggedright}
                                                             2680 \def\@parfont{\bfseries\itshape}
                                                             2681 \def\@subparfont{\itshape}
                                                             2682 \or % sigchi
                                                             2683 \setcounter{secnumdepth}{1}
                                                             2684 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
```

```
2685 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2686 \or % sigchi-a
2687 \setcounter{secnumdepth}{0}
2688 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2689 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2690 \fi

\@adddotafter Add punctuation after a sectioning command
2691 \def\@adddotafter#1{#1\@addpunct{.}}

\@addspaceafter Add space after a sectioning command
2692 \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.

2693 \providecommand\*\@dotsep{4.5}

#### 3.19 Theorems

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

2694 \def\@acmplainbodyfont{\itshape}

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

2695 \def\@acmplainindent{\parindent}

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

2696 \def\@acmplainheadfont{\scshape}

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

2697 \def\@acmplainnotefont{\@empty}

Customization of the acmplain theorem style:

```
2698 \ifcase\ACM@format@nr
2699 \relax % manuscript
2700 \or % acmsmall
2701 \or % acmlarge
2702 \or % acmtog
2703 \or % sigconf
2704 \or % siggraph
2705 \or % sigplan
2706 \def\@acmplainbodyfont{\itshape}
2707 \def\@acmplainindent{\z@}
2708 \def\@acmplainheadfont{\bfseries}
2709 \def\@acmplainnotefont{\normalfont}
```

```
2710 \or % sigchi
                         2711 \or % sigchi-a
                         2712 \fi
               acmplain The acmplain theorem style
                         2713 \newtheoremstyle{acmplain}%
                         2714 {.5\baselineskip\@plus.2\baselineskip
                                \@minus.2\baselineskip}% space above
                         2715
                             {.5\baselineskip\@plus.2\baselineskip
                         2716
                                \@minus.2\baselineskip}% space below
                         2717
                         2718 {\@acmplainbodyfont}% body font
                         2719 {\@acmplainindent}% indent amount
                         2720 {\@acmplainheadfont}% head font
                         2721 {.}% punctuation after head
                         2722 {.5em}% spacing after head
                             {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont(#3)}}}% head spec
\@acmdefinitionbodyfont The font to typeset the body of the acmdefinition theorem style.
                         2724 \def\@acmdefinitionbodyfont{\normalfont}
  \@acmdefinitionindent The amount to indent the acmdefinition theorem style.
                         2725 \def\@acmdefinitionindent{\parindent}
\@acmdefinitionheadfont The font to typeset the head of the acmdefinition theorem style.
                         2726 \def\@acmdefinitionheadfont{\itshape}
\@acmdefinitionnotefont The font to typeset the note of the acmdefinition theorem style.
                         2727 \def\@acmdefinitionnotefont{\@empty}
                             Customization of the acmdefinition theorem style:
                         2728 \ifcase\ACM@format@nr
                         2729 \relax % manuscript
                         2730 \or % acmsmall
                         2731 \or % acmlarge
                         2732 \or % acmtog
                         2733 \or % sigconf
                         2734 \or % siggraph
                         2735 \or % sigplan
                         2736 \def\@acmdefinitionbodyfont{\normalfont}
                         2737
                              \def\@acmdefinitionindent{\z@}
                              \def\@acmdefinitionheadfont{\bfseries}
                         2739 \def\@acmdefinitionnotefont{\normalfont}
                         2740 \or % sigchi
                         2741 \or % sigchi-a
                         2742 \fi
          acmdefinition The acmdefinition theorem style
                         2743 \newtheoremstyle{acmdefinition}%
```

2744 {.5\baselineskip\@plus.2\baselineskip

```
\@minus.2\baselineskip}% space above
2745
     {.5\baselineskip\@plus.2\baselineskip
2746
        \@minus.2\baselineskip}% space below
2747
     {\@acmdefinitionbodyfont}% body font
2748
     {\@acmdefinitionindent}% indent amount
2749
     {\@acmdefinitionheadfont}% head font
2751
     {.}% punctuation after head
     {.5em}% spacing after head
2752
    {\thmname{\#1}}\thmnumber{\#2}\thmnote{ {\center} definitionnotefont(\#3)}}}\ head \ spec
2753
```

Make acmplain the default theorem style.

```
2754 \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/acm">https://github.com/borisveytsman/acm</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.

```
2755 \AtEndPreamble{%
2756
     \if@ACM@acmthm
2757
     \theoremstyle{acmplain}
     \@ifundefined{theorem}{%
2758
     \newtheorem{theorem}{Theorem}[section]
2759
2760
     \@ifundefined{conjecture}{%
2761
2762
     \newtheorem{conjecture}[theorem]{Conjecture}
2763
2764
     \@ifundefined{proposition}{%
     \newtheorem{proposition}[theorem]{Proposition}
2765
     }{}
2766
     \@ifundefined{lemma}{%
2767
     \newtheorem{lemma}[theorem]{Lemma}
2768
2769
     \@ifundefined{corollary}{%
2770
     \newtheorem{corollary}[theorem]{Corollary}
2771
2772
     \theoremstyle{acmdefinition}
2773
     \@ifundefined{example}{%
2774
     \newtheorem{example}[theorem]{Example}
2775
2776
2777
     \@ifundefined{definition}{%
     \newtheorem{definition}[theorem]{Definition}
2778
2779
     }{}
2780
     \theoremstyle{acmplain}
2781
2782 }
```

\@proofnamefont The font to typeset the proof name.

```
{\tt 2783 \setminus def \setminus @proofname font \{ \setminus scshape \}}
```

## \@proofindent Whether or not to indent proofs.

2784 \def\@proofindent{\indent}

Customization of the proof environment.

```
2785 \ifcase\ACM@format@nr
2786 \relax % manuscript
2787 \or % acmsmall
2788 \or % acmlarge
2789 \or % acmtog
2790 \or % sigconf
2791 \or % siggraph
2792 \or % sigplan
2793 \def\@proofnamefont{\itshape}
2794 \def\@proofindent{\noindent}
2795 \or % sigchi
2796 \or % sigchi-a
2797 \fi
```

proof We want some customization of the proof environment.

## 3.20 Balancing columns

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

```
2807 \AtEndPreamble{%
     \if@ACM@balance
2808
        \ifcase\ACM@format@nr
2809
        \relax % manuscript
2810
             \global\@ACM@balancefalse
2811
           \or % acmsmall
2812
             \global\@ACM@balancefalse
2813
           \or % acmlarge
2814
             \global\@ACM@balancefalse
2815
2816
           \or % acmtog
2817
              \RequirePackage{balance}%
2818
           \or % sigconf
2819
              \RequirePackage{balance}%
           \or % siggraph
2820
              \RequirePackage{balance}%
2821
```

```
\or % sigplan
2822
              \RequirePackage{balance}%
2823
           \or % sigchi
2824
              \RequirePackage{balance}%
2825
           \or % sigchi-a
2826
2827
              \global\@ACM@balancefalse
2828
       \fi
     \fi
2829
2830 }
2831 \AtEndDocument{%
     \if@ACM@balance
2832
     \if@twocolumn
     \balance
     \fi\fi}
```

## 3.21 Acknowledgments

```
\acksname
            2836 \newcommand\acksname{Acknowledgments}
       \acks This is a comment-like structure
            2837 \specialcomment{acks}{%
            2838
                 \begingroup
                 \section*{\acksname}
            2839
                 \phantomsection\addcontentsline{toc}{section}{\acksname}
            2840
            2841 }{%
            2842
                 \endgroup
            2843 }
             We just typeset the name of the sponsor
\grantsponsor
            2844 \def\grantsponsor#1#2#3{#2}
   \grantnum
            2845 \newcommand\grantnum[3][]{#3%
```

# 3.22 Conditional typesetting

We use the comment package for conditional typesetting:

```
2847 \AtEndPreamble{%
2848 \if@ACM@screen
2849 \includecomment{screenonly}
2850 \excludecomment{printonly}
2851 \else
2852 \excludecomment{screenonly}
2853 \includecomment{printonly}
2854 \fi
2855 \if@ACM@anonymous
```

```
\excludecomment{anonsuppress}
2856
     \excludecomment{acks}
2857
2858 \else
    \includecomment{anonsuppress}
2859
2860 \fi}
```

#### 3.23 Additional bibliography commands

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

```
2861 \newcommand\showeprint[2][arxiv]{%
     \def\@tempa{#1}%
2862
     \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2863
     \def\@tempb{arxiv}%
2864
     \ifx\@tempa\@tempb
2865
        arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2866
2867
```

## 3.24 End of Class

2882 (/class)

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

```
2868 \let\@vspace@orig=\@vspace
2869 \let\@vspacer@orig=\@vspacer
2871
    only be used to provide space above/below surrounding
2872
    objects}}{}{}
only be used to provide space above/below surrounding
2874
    objects}}{}{}
2875
```

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

```
2876 \let\ACM@origbaselinestretch\baselinestretch
2877 \AtEndDocument{\ifx\baselinestretch\ACM@origbaselinestretch\else
     \ClassError{\@classname}{An attempt to redefine
       \string\baselinestretch\space detected. Please do not do this for
2879
       ACM submissions!}\fi}
2880
2881 \normalsize\normalfont\frenchspacing
```