# LaTeX Class for *Association for Computing Machinery*[*]

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**Abstract**

This package provides a class for typesetting publications of Association for Computing Machinery.

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# 1 Introduction

Association for Computing Machinery is the world's largest educational and scientific computing society, which delivers resources that advance computing as a science and a profession[1]. It was one of the earily adopters of TEX for its typesetting.

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

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

The 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 the package.

I am grateful to Matthew Fluet, John Owens, Craig Rodkin, Bernard Rous, David Shamma, Stephen Spencer and many others for their invaluable help.

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

# 2 User's guide

## 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 the package uses a number relatively recent packages, especially the ones related to the fonts.

If you decide to install the package yourself, follow the standard rules:

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

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

The 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

[1] http://www.acm.org/

- *amsfonts*, http://www.ctan.org/pkg/amsfonts
- *amsmath*, http://www.ctan.org/pkg/amsmath
- *binhex*, http://www.ctan.org/pkg/binhex
- *caption*, http://www.ctan.org/pkg/caption
- *comment*, http://www.ctan.org/pkg/comment
- *environ*, http://www.ctan.org/pkg/environ
- *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
- *latex-tools*, http://www.ctan.org/pkg/latex-tools
- *libertine*, http://www.ctan.org/pkg/libertine
- *manyfoot*, http://www.ctan.org/pkg/manyfoot
- *microtype*, http://www.ctan.org/pkg/microtype
- *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
- *setspace*, http://www.ctan.org/pkg/setspace
- *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

## 2.2 Invocation and options

To use the class put in the premable of your document

```
\documentclass[⟨options⟩]{acmart}
```

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

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

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

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

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

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

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

There are several Boolean options which can take `true` or `false` values. They are listed in Table 2. The words `=true` can be omitted when setting the 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 copyeditors.

The option `screen` may in the future involve additional features suitable for on-screen versions of the articles.

The option `natbib` is used when the corresponding BibTeX style is based on `natbib`. In most cases you do not need to set it. See Section 2.10.

The option `anonymous` is used for anonymous review process: all author information becomes obscured.

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, TAAS, TACCESS, TACO, TALG, TALLIP (formerly TALIP), TCPS, TEAC, TECS, TIIS, 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, TRETS, TSAS, TSC, TSLP, TWEB. |
| `acmlarge` | Large single column format, used for IMWUT, JOCCH, PACMPL, TAP |
| `acmtog` | Large double column format, used for TOG |
| `sigconf` | Proceedings format for most of ACM conferences (with the exceptions listed below) |
| `siggraph` | Proceedings format for SIGGRAPH and SIGGRAPH Asia conferences, published in ACM Transactions on Graphics journal issues |
| `sigplan` | Proceedings format for SIGPLAN conferences |
| `sigchi` | Proceedings format for SIGCHI conferences |
| `sigchi-a` | Format for SIGCHI extended abstract |

Table 2: Boolean options

| Option | Default | Meaning |
|---|---|---|
| `review` | `false` | A review version: lines are numbered, hyperlinks are colored |
| `screen` | `false` | A screen version: hyperlinks are colored |
| `natbib` | `true` | Whether to use `natbib` package (see Section 2.10) |
| `anonymous` | `false` | Whether to make author(s) anonymous |
| `authorversion` | `false` | Whether to generate a special version for authors' personal use or posting (see Section 2.3) |

## 2.3 Topmatter commands

A number of commands set up *top matter* information, or, in the computer science jargon, *metadata* for the article. They establish the publication name, article title, authors, doi and other data. Some of these commands, like `\title` or `\author`, should be put by the authors. Others, like `\acmVolume` or `\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 the previous versions of ACM classes some of these commands should be used before `\maketitle`, and some after it. Now they all must be used before `\maketitle`.

The class internally loads `amsart` class, so many top matter commands are inherited from `amsart` [2].

`\acmJournal` The macro `\acmJournal{`⟨*shortName*⟩`}` 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 3. Note that conference proceedings published in *book* form do not set this macro.

It is expected that this command is inserted by the author of the manuscript when she decides to which journal to submit the manuscript.

`\acmConference` The macro `\acmConference[`⟨*short name*⟩`]{`⟨*name*⟩`}{`⟨*date*⟩`}{`⟨*venue*⟩`}` 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 *or* the name of the book as set by the editor.

**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}
```

Normally this command is entered either by the editor or by the typesetter.

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

`\title[`⟨*ShortTitle*⟩`]{`⟨*FullTitle*⟩`}`

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.

Table 3: ACM publications and arguments of the `\acmJournal` command

| Abbreviation | Publication |
|---|---|
| CIE | ACM Computers in Entertainment |
| CSUR | ACM Computing Surveys |
| 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 |
| JOCCH | ACM Journal on Computing and Cultural Heritage |
| PACMPL | PACM on Programming Languages |
| 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 |
| TEAC | ACM Transactions on Economics and Computation |
| TECS | ACM Transactions on Embedded Computing Systems |
| TIIS | ACM Transactions on Interactive Intelligent Systems |
| 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 Computing Systems |
| TOMS | ACM Transactions on Mathematical Software |
| TOPC | ACM Transactions on Parallel Computing |
| TOPLAS | ACM Transactions on Programming Languages and Systems |
| TOPS | ACM Transactions on Privacy and Security |
| TOS | ACM Transactions on Storage |
| TOSEM | ACM Transactions on Software Engineering and Methodology |
| TOSN | ACM Transactions on Sensor Networks |
| 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 |

\subtitle

Besides title, ACM classes allow subtitle, set with the `\subtitle{⟨subtitle⟩}` macro.

The commands for specification of 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 ORCID, http://www.orcid.org/), `\affiliation` and `\email`. In the simplest case you enter them in this order:

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

Do *not* use LaTeX `\and` macro! Each author deserves his or her own `\author` command.

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

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

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

Similarly you can repeat `\email` command.

You may have several authors with the same afifliation, 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, and author $A_3$ is affiliated with $I_1$ and $I_3$, …). The recommended solution is to put the `\affiliation` commands after each author, possibly repeating them:

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

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

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

However, this format is not generally recommended.

\position
\institution
\department
\streetaddress
\city
\state
\postcode
\country

The \affiliation command is further structured to interact with the metadata extraction tools. Inside the this command you should use \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 old ACM conference formats did not allow for more than six authors and required some efforts from the authors to achieve alignment. The new format is much better in this.

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

\thanks Like amsart (and unlike standard LaTeX), we allow \thanks only *outside* of commands \title and \author. Example:

```
\thanks{This work is supported by the Widget Corporation Grant
\#312-001.\\
Author's address: D. Pineo, Kingsbury Hall, 33 Academic Way, Durham,
N.H. 03824; email: dspineo@comcast.net; Colin Ware, Jere A. Chase
Ocean Engineering Lab, 24 Colovos Road, Durham, NH 03824; email:
cware@ccom.unh.edu;
Sean Fogarty, (Current address) NASA Ames Research Center, Moffett
Field, California 94035.}
```

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

\titlenote \subtitlenote \authornote While the command \thanks generates a note without 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}
```

\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, including \acmMonth, for example,

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

\acmArticleSeq The articles in the same issue of a journal have *sequential number*. It is used to position black blob in same formats. By default it is the same as article number, but the command \acmArticleSeq{⟨*n*⟩} can be used to change it:

```
\acmArticle{39}   % The sequence number will be 39 by default
\acmArticleSeq{5} % We redefine it to 5
```

\acmPrice The macro \acmPrice{⟨*price*⟩} sets the price for the article (by default 15.00), for

example,

```
\acmPrice{25.00}
```

\acmISBN Book-like volumes have ISBN numbers attached to them. The macro \acmISBN{⟨*ISBN*⟩} sets it. Normally it is set by the typesetter, for example,

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

\acmDOI The macro \acmDOI{⟨*DOI*⟩} sets the DOI number of the article, for example,

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

It is normally set by the typesetter.

\acmBadgeR \acmBadgeL Some conference articles get special distinction, 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. The class provides commands to add these badges: \acmBadgeR[⟨*url*⟩]{⟨*graphics*⟩} and \acmBadgeL[⟨*url*⟩]{⟨*graphics*⟩}. 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 abstract, which puts the badges on the left margin. The argument have the following meaning: [⟨*url*⟩], if provided, sets the link to the badge authority in the screen version, while {⟨*graphics*⟩} 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{⟨*page*⟩} sets the first page of the article in the journal or book. It is used by the typesetter.

\terms \keywords The macros \terms{⟨*term, term,…*⟩} and \keywords{⟨*keyword, keyword,…*⟩} set the main terms and the additional keywords for the article. Term and keywords must be separated by commas, for example,

```
\terms{wireless, interference}
\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 the 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 the result 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_id>10003033.10003083.10003095</concept_id>
  <concept_desc>Networks~Network reliability</concept_desc>
  <concept_significance>100</concept_significance>
 </concept>
</ccs2012>
\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 need to just copy this code and paste it in your paper anywhere before `\maketitle`.

`\setcopyright` There are several possibilities for the copyright of the papers published by ACM: the authors may transfer the rights to ACM, license them to ACM, some or all authors might be employees of the US or Canada Government, 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 4.

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 decision 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

Table 4: Parameters for \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 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. |

the 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* \maketitle command. Again, this is different from the standard LATEX.

teaserfigure A special kind of figure is used for many two-column conference proceedings. 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 may override these defaults using the command \settopmatter{⟨*settings*⟩}. The settings and their meanings are listed in Table 5. For example,

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

\received The command \received[⟨*stage*⟩]{⟨*date*⟩} sets the history of the publication. The [⟨*stage*⟩] argument is optional; the default is Received for the first date and revised for the subsequent ones. For example

Table 5: Settings for `\settopmatter` command

| Parameter | Values | Meaning |
|---|---|---|
| printccs | true/false | Whether to print CCS categories |
| printacmref | true/false | Whether to print ACM bibliographic entry |
| printfolios | true/false | Whether to print page numbers (folios) |

```
\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: i.e., 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 may redefine it if the list of author's name is too long, e.g.,

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

## 2.4 Algorithms

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

## 2.5 Figures and tables

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 the tables *before* the table bodies.
2. ACM uses the standard types for figures and types and adds several new ones. In total there are follwing types:

   **figure, table:** a standard figure or table, taking full text width in one-column formats and one column in two-column formats.

   **figure*, table*** in two-column formats, a special figure or table taking full text width.

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

   **sidebar, marginfigure, margintable:** in the `sigchi-a` format, special sidebars, tables and figures on the margin.

3. Accordingly, when scaling the images, one should use the following sizes:
   (a) For `figure` in one-column mode, `figure*` in two-column mode or `teaserfigure`—`\textwidth` (in the one-column you can also use `\columnwidth`, which coincides with `\textwidth` in this case).
   (b) For `figure` in two-column mode—`\columnwidth`.
   (c) For `marginfigure`–`\marginparwidth`.
   (d) For `figure*` in SIGCHI Extended abstracts—`\fulltextwidth`.

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

1. Never, ever use vertical rules.
2. Never use double rules.

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

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

```
\begin{table}
\caption{Simulation Configuration}
\label{tab:conf}
\begin{minipage}{\columnwidth}
\begin{center}
\begin{tabular}{ll}
  \toprule
  TERRAIN\footnote{This is a table footnote. This is a
    table footnote. This is a table footnote.}   &
    (200\,m$\times$200\,m) Square\\
  Node Number     & 289\\
  Node Placement  & Uniform\\
  Application     & Many-to-Many/Gossip CBR Streams\\
  Payload Size    & 32 bytes\\
  Routing Layer   & GF\\
  MAC Layer       & CSMA/MMSN\\
  Radio Layer     & RADIO-ACCNOISE\\
  Radio Bandwidth & 250Kbps\\
  Radio Range     & 20m--45m\\
  \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 abstract extensively uses margin space. The package provides three environments for this with option captions:

**sidebar:** textual information on the margin

**marginfigure:** a figure on the margin

**margintable:** a table on 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 decision. A good way to do so is to put the contents into a `\minipage` of the width `\columnwidth`.

## 2.6 Theorems

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

**acmplain:** this is the style used for `theorem`, `conjecture`, `proposition`, `lemma`, `corollary`, and

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

## 2.7 Online-only and offline-only material

printonly
screenonly

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

```
\section{Supplementary materials}

\begin{printonly}
  This section is included in the online version of the paper.
\end{printonly}

\begin{screenonly}
  (The actual section).
\end{screenonly}
```

We use *comment* package for typesetting this code, so `\begin` and `\end` should start at the first positions of the lines of their own (no initial spaces etc.).

## 2.8 Note about anonymous mode

anonsuppress

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

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

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

## 2.9 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 the anonymous mode this section must be omitted: it gives too much information to the reviewers. Second, the data about the 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 printonly and screenonly environments, \begin{acks} and \end{acls} should start the line of their own (no leading or trailing spaces).

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

\grantsponsor{⟨*sponsorID*⟩}{⟨*name*⟩}{⟨*url*⟩}
\grantnum[⟨*url*⟩]{⟨*sponsorID*⟩}{⟨*number*⟩}.

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

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. The work is
  supported by the \grantsponsor{GS501100001809}{National Natural
  Science Foundation of
  China}{http://dx.doi.org/10.13039/501100001809} under Grant
  No.:~\grantnum{GS501100001809}{61273304}
  and~\grantnum[http://www.nnsf.cn/youngscientsts]{GS501100001809}{Young
  Scientsts' Support Program}.
\end{acks}
```

## 2.10 Bibliography

ACM uses *natbib* package for formatting of referencing ant the style `ACM-Reference-Format.bst` for BibTEX processing. You may disable loading of *natbib* by 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 sitation styles: the author-year format `acmauthoryear` or the numeric format `acmnumeric` using the command `\citestyle`, for example,

```
\citestyle{acmauthoryear}
```

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

`\setcitestyle` You may further customize *natbib* using `\setcitestyle` command, for example,

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

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 the author-date mode.

There are several customized BibTEX entries and fields in ACM style `ACM-Reference-Format.bst` you may want to be aware of.

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

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

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

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

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

There are special entries `online` and `game` 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",
}
```

For these entries you can use the lastaccessed field to add the access date to the URL.

There are two ways to enter video and audio sources in the bibliograpy corresponding to two different possibilies. For standalone sources available on WWW you can use an online entry, setting there howpublished field, for example,

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

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

```
@Inproceedings{Novak03,
 author =       "Dave Novak",
 title =        "Solder man",
 booktitle =    {ACM SIGGRAPH 2003 Video Review on Animation theater
                 Program},
 year =         "2003",
 publisher =   "ACM Press",
 address =   "New York, NY",
 pages =        "4",
 month =   "March 21, 2008",
 doi =   "99.9999/woot07-S422",
 howpublished = "Video"
}
```

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

```
@periodical{JCohen96,
 key =   "Cohen",
 editor =       "Jacques Cohen",
 title =        "Special issue: Digital Libraries",
 journal =      CACM,
 volume =       "39",
 number =   "11",
 month =  nov,
 year =   "1996",
}
```

## 2.11 Colors

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

## 2.12 Other notable packages and typographic remarks

Several other packages are recommended for specialized tasks.

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

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

# 3 Implementation

## 3.1 Identification

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

```
⟨class⟩\NeedsTeXFormat{LaTeX2e}
⟨*gobble⟩
\ProvidesFile{acmart.dtx}
⟨/gobble⟩
⟨class⟩\ProvidesClass{acmart}
[2017/01/07 v1.28 Typesetting articles for Association of
Computing Machinery]
```

And the driver code:

```
⟨*gobble⟩
\documentclass{ltxdoc}
\usepackage{array,booktabs,amsmath,graphicx,fancyvrb,tabularx}
\usepackage[tt=false]{libertine}
\usepackage[varqu]{zi4}
\usepackage[libertine]{newtxmath}
\usepackage[tableposition=top]{caption}
\usepackage{hypdoc}
\PageIndex
\CodelineIndex
\RecordChanges
\EnableCrossrefs
\begin{document}
  \DocInput{acmart.dtx}
\end{document}
⟨/gobble⟩
⟨*class⟩
\def\@classname{acmart}
```

## 3.2 Options

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

```
\RequirePackage{xkeyval}
```

`format` The possible formats

```
\define@choicekey*+{acmart.cls}{format}[\ACM@format\ACM@format@nr]{%
  manuscript, acmsmall, acmlarge, acmtog, sigconf, siggraph,
  sigplan, sigchi, sigchi-a}[manuscript]{}{%
  \ClassError{\@classname}{The option format must be manuscript,
    acmsmall, acmlarge, acmtog, sigconf, siggraph,
    sigplan, sigchi or sigchi-a}}
\def\@DeclareACMFormat#1{\DeclareOptionX{#1}{\setkeys{acmart.cls}{format=#1}}}
\@DeclareACMFormat{manuscript}
```

```
\@DeclareACMFormat{acmsmall}
\@DeclareACMFormat{acmlarge}
\@DeclareACMFormat{acmtog}
\@DeclareACMFormat{sigconf}
\@DeclareACMFormat{siggraph}
\@DeclareACMFormat{sigplan}
\@DeclareACMFormat{sigchi}
\@DeclareACMFormat{sigchi-a}
\ExecuteOptionsX{format}
```

`\if@ACM@screen` Whether we use screen mode

```
\define@boolkey+{acmart.cls}[@ACM@]{screen}[true]{%
  \if@ACM@screen
    \PackageInfo{\@classname}{Using screen mode}%
  \else
    \PackageInfo{\@classname}{Not using screen mode}%
  \fi}{\PackageError{\@classname}{Option screen can be either true or
    false}}
\ExecuteOptionsX{screen=false}
```

`\if@ACM@review` Whether we use review mode

```
\define@boolkey+{acmart.cls}[@ACM@]{review}[true]{%
  \if@ACM@review
    \PackageInfo{\@classname}{Using review mode}%
  \else
    \PackageInfo{\@classname}{Not using review mode}%
  \fi}{\PackageError{\@classname}{Option review can be either true or
    false}}
\ExecuteOptionsX{review=false}
```

`\if@ACM@authorversion` Whether we use author's version

```
\define@boolkey+{acmart.cls}[@ACM@]{authorversion}[true]{%
  \if@ACM@authorversion
    \PackageInfo{\@classname}{Using authorversion mode}%
  \else
    \PackageInfo{\@classname}{Not using authorversion mode}%
  \fi}{\PackageError{\@classname}{Option authorversion can be either true or
    false}}
\ExecuteOptionsX{authorversion=false}
```

`\if@ACM@natbib@override` Whether to override the format decision about *natbib*

```
\newif\if@ACM@natbib@override
\@ACM@natbib@overridefalse
```

`\if@ACM@natbib` Whether we use natbib mode

```
\define@boolkey+{acmart.cls}[@ACM@]{natbib}[true]{%
  \@ACM@natbib@overridetrue
  \if@ACM@natbib
    \PackageInfo{\@classname}{Explicitly selecting natbib mode}%
```

```
  \else
    \PackageInfo{\@classname}{Explicitly deselecting natbib mode}%
  \fi}{\PackageError{\@classname}{Option natbib can be either true or
    false}}
```

`\if@ACM@anonymous` Whether we use anonymous mode

```
\define@boolkey+{acmart.cls}[@ACM@]{anonymous}[true]{%
  \if@ACM@anonymous
    \PackageInfo{\@classname}{Using anonymous mode}%
  \else
    \PackageInfo{\@classname}{Not using anonymous mode}%
  \fi}{\PackageError{\@classname}{Option anonymous can be either true or
    false}}
\ExecuteOptionsX{anonymous=false}
```

`\ACM@fontsize` The font size to pass to the base class

```
\def\ACM@fontsize{}
\DeclareOptionX{9pt}{\edef\ACM@fontsize{\CurrentOption}}
\DeclareOptionX{10pt}{\edef\ACM@fontsize{\CurrentOption}}
\DeclareOptionX{11pt}{\edef\ACM@fontsize{\CurrentOption}}
\DeclareOptionX{12pt}{\edef\ACM@fontsize{\CurrentOption}}

\DeclareOptionX{draft}{\PassOptionsToClass{\CurrentOption}{amsart}}
\DeclareOptionX{*}{\PassOptionsToClass{\CurrentOption}{amsart}}
\ProcessOptionsX
\ClassInfo{\@classname}{Using format \ACM@format, number \ACM@format@nr}
```

## 3.3 Setting switches

`\if@ACM@manuscript` Whether we use manuscript mode

```
\newif\if@ACM@manuscript
```

`\if@ACM@journal` There are two kinds of publications: journals and books

```
\newif\if@ACM@journal
```

`\if@ACM@sigchiamode` The formatting of SIGCHI abstracts is quite unusual. We have a special switch for them.

```
\newif\if@ACM@sigchiamode
```

Setting up switches

```
\ifnum\ACM@format@nr=0\relax
  \@ACM@manuscripttrue
\else
  \@ACM@manuscriptfalse
\fi
\@ACM@sigchiamodefalse
\ifcase\ACM@format@nr
\relax % manuscript
  \@ACM@journaltrue
```

```
\or % acmsmall
  \@ACM@journaltrue
\or % acmlarge
  \@ACM@journaltrue
\or % acmtog
  \@ACM@journaltrue
\or % sigconf
  \@ACM@journalfalse
\or % siggraph
  \@ACM@journalfalse
 \or % sigplan
  \@ACM@journalfalse
 \or % sigchi
  \@ACM@journalfalse
\or % sigchi-a
  \@ACM@journalfalse
  \@ACM@sigchiamodetrue
\fi
```

A format sets up `\if@ACM@natbib` only if `\@ACM@natbib@override` is false (i.e. user did *not* overrode format's selection):

```
\if@ACM@natbib@override\else
    \@ACM@natbibtrue
\fi
```

## 3.4 Loading base class and package

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

```
\ifx\ACM@fontsize\@empty
  \ifcase\ACM@format@nr
  \relax % manuscript
    \def\ACM@fontsize{9pt}%
  \or % acmsmall
    \def\ACM@fontsize{10pt}%
  \or % acmlarge
    \def\ACM@fontsize{10pt}%
  \or % acmtog
    \def\ACM@fontsize{9pt}%
  \or % sigconf
    \def\ACM@fontsize{9pt}%
  \or % siggraph
    \def\ACM@fontsize{9pt}%
   \or % sigplan
    \def\ACM@fontsize{9pt}%
   \or % sigchi
    \def\ACM@fontsize{10pt}%
  \or % sigchi-a
    \def\ACM@fontsize{10pt}%
  \fi
\fi
```

```
\ClassInfo{\@classname}{Using fontsize \ACM@fontsize}
\LoadClass[\ACM@fontsize, reqno]{amsart}
\RequirePackage{microtype}
```

We need `totpages` package to calculate the number of pages

```
\RequirePackage{totpages}
```

The `amsmath` `\collect@body` is defined using `\def`. We load `environ` to access the `\long` version of the command

```
\RequirePackage{environ}
```

We use `setspace` for doublespacing

```
\if@ACM@manuscript
\RequirePackage{setspace}
\onehalfspacing
\fi
```

Citations. We patch `\setcitestyle` to allow, e.g., `\setcitestyle{sort}` and `\setcitestyle{nosort}`. We patch `\citestyle` to warn about undefined citation styles.

```
\if@ACM@natbib
  \RequirePackage{natbib}
  \renewcommand{\bibsection}{%
     \section*{\refname}%
     \phantomsection\addcontentsline{toc}{section}{\refname}%
  }
  \renewcommand{\bibfont}{\bibliofont}
  \renewcommand\setcitestyle[1]{
  \@for\@tempa:=#1\do
  {\def\@tempb{round}\ifx\@tempa\@tempb
     \renewcommand\NAT@open{(}\renewcommand\NAT@close{)}\fi
   \def\@tempb{square}\ifx\@tempa\@tempb
     \renewcommand\NAT@open{[}\renewcommand\NAT@close{]}\fi
   \def\@tempb{angle}\ifx\@tempa\@tempb
     \renewcommand\NAT@open{$<$}\renewcommand\NAT@close{$>$}\fi
   \def\@tempb{curly}\ifx\@tempa\@tempb
     \renewcommand\NAT@open{\{}\renewcommand\NAT@close{\}}\fi
   \def\@tempb{semicolon}\ifx\@tempa\@tempb
     \renewcommand\NAT@sep{;}\fi
   \def\@tempb{colon}\ifx\@tempa\@tempb
     \renewcommand\NAT@sep{;}\fi
   \def\@tempb{comma}\ifx\@tempa\@tempb
     \renewcommand\NAT@sep{,}\fi
   \def\@tempb{authoryear}\ifx\@tempa\@tempb
     \NAT@numbersfalse\fi
   \def\@tempb{numbers}\ifx\@tempa\@tempb
     \NAT@numberstrue\NAT@superfalse\fi
   \def\@tempb{super}\ifx\@tempa\@tempb
     \NAT@numberstrue\NAT@supertrue\fi
   \def\@tempb{nobibstyle}\ifx\@tempa\@tempb
     \let\bibstyle=\@gobble\fi
```

```
  \def\@tempb{bibstyle}\ifx\@tempa\@tempb
    \let\bibstyle=\@citestyle\fi
  \def\@tempb{sort}\ifx\@tempa\@tempb
    \def\NAT@sort{\@ne}\fi
  \def\@tempb{nosort}\ifx\@tempa\@tempb
    \def\NAT@sort{\z@}\fi
  \def\@tempb{compress}\ifx\@tempa\@tempb
    \def\NAT@cmprs{\@ne}\fi
  \def\@tempb{nocompress}\ifx\@tempa\@tempb
    \def\NAT@cmprs{\@z}\fi
  \def\@tempb{sort&compress}\ifx\@tempa\@tempb
    \def\NAT@sort{\@ne}\def\NAT@cmprs{\@ne}\fi
  \def\@tempb{mcite}\ifx\@tempa\@tempb
    \let\NAT@merge\@ne\fi
  \def\@tempb{merge}\ifx\@tempa\@tempb
    \@ifnum{\NAT@merge<\tw@}{\let\NAT@merge\tw@}{}\fi
  \def\@tempb{elide}\ifx\@tempa\@tempb
    \@ifnum{\NAT@merge<\thr@@}{\let\NAT@merge\thr@@}{}\fi
  \def\@tempb{longnamesfirst}\ifx\@tempa\@tempb
    \NAT@longnamestrue\fi
  \def\@tempb{nonamebreak}\ifx\@tempa\@tempb
    \def\NAT@nmfmt#1{\mbox{\NAT@up#1}}\fi
  \expandafter\NAT@find@eq\@tempa=\relax\@nil
  \if\@tempc\relax\else
    \expandafter\NAT@rem@eq\@tempc
    \def\@tempb{open}\ifx\@tempa\@tempb
     \xdef\NAT@open{\@tempc}\fi
    \def\@tempb{close}\ifx\@tempa\@tempb
     \xdef\NAT@close{\@tempc}\fi
    \def\@tempb{aysep}\ifx\@tempa\@tempb
     \xdef\NAT@aysep{\@tempc}\fi
    \def\@tempb{yysep}\ifx\@tempa\@tempb
     \xdef\NAT@yrsep{\@tempc}\fi
    \def\@tempb{notesep}\ifx\@tempa\@tempb
     \xdef\NAT@cmt{\@tempc}\fi
    \def\@tempb{citesep}\ifx\@tempa\@tempb
     \xdef\NAT@sep{\@tempc}\fi
  \fi
 }%
 \NAT@@setcites
 }
 \renewcommand\citestyle[1]{%
   \ifcsname bibstyle@#1\endcsname%
   \csname bibstyle@#1\endcsname\let\bibstyle\@gobble%
   \else%
   \@latex@error{Undefined `#1' citestyle}%
   \fi
 }%
\fi
```

\bibstyle@acmauthoryear The default author-year format:

```
\newcommand{\bibstyle@acmauthoryear}{%
  \setcitestyle{%
    authoryear,%
    open={(},close={)},citesep={;},%
    aysep={},yysep={,},%
    notesep={, }}}
```

\bibstyle@acmnumeric The default numeric format:

```
\newcommand{\bibstyle@acmnumeric}{%
  \setcitestyle{%
    numbers,sort&compress,%
    open={[},close={]},citesep={,},%
    notesep={, }}}
```

The default is numeric:

```
\if@ACM@natbib
\citestyle{acmnumeric}
\fi
```

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

```
\def\@startsection#1#2#3#4#5#6{%
  \if@noskipsec \leavevmode \fi
  \par
  \@tempskipa #4\relax
  \@afterindenttrue
  \ifdim \@tempskipa <\z@
    \@tempskipa -\@tempskipa \@afterindentfalse
  \fi
  \if@nobreak
    \everypar{}%
  \else
    \addpenalty\@secpenalty\addvspace\@tempskipa
  \fi
  \@ifstar
    {\@ssect{#3}{#4}{#5}{#6}}%
    {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}}
\def\@sect#1#2#3#4#5#6[#7]#8{%
  \ifnum #2>\c@secnumdepth
    \let\@svsec\@empty
  \else
    \refstepcounter{#1}%
    \protected@edef\@svsec{\@seccntformat{#1}\relax}%
  \fi
  \@tempskipa #5\relax
  \ifdim \@tempskipa>\z@
    \begingroup
      #6{%
```

```
        \@hangfrom{\hskip #3\relax\@svsec}%
          \interlinepenalty \@M #8\@@par}%
    \endgroup
    \csname #1mark\endcsname{#7}%
    \addcontentsline{toc}{#1}{%
      \ifnum #2>\c@secnumdepth \else
        \protect\numberline{\csname the#1\endcsname}%
      \fi
      #7}%
  \else
    \def\@svsechd{%
      #6{\hskip #3\relax
      \@svsec #8}%
      \csname #1mark\endcsname{#7}%
      \addcontentsline{toc}{#1}{%
        \ifnum #2>\c@secnumdepth \else
          \protect\numberline{\csname the#1\endcsname}%
        \fi
        #7}}%
  \fi
  \@xsect{#5}}
\def\@xsect#1{%
  \@tempskipa #1\relax
  \ifdim \@tempskipa>\z@
    \par \nobreak
    \vskip \@tempskipa
    \@afterheading
  \else
    \@nobreakfalse
    \global\@noskipsectrue
    \everypar{%
      \if@noskipsec
        \global\@noskipsecfalse
       {\setbox\z@\lastbox}%
        \clubpenalty\@M
        \begingroup \@svsechd \endgroup
        \unskip
        \@tempskipa #1\relax
        \hskip -\@tempskipa
      \else
        \clubpenalty \@clubpenalty
        \everypar{}%
      \fi}%
  \fi
  \ignorespaces}
\def\@seccntformat#1{\csname the#1\endcsname\quad}
\def\@ssect#1#2#3#4#5{%
  \@tempskipa #3\relax
  \ifdim \@tempskipa>\z@
    \begingroup
```

```
      #4{%
        \@hangfrom{\hskip #1}%
          \interlinepenalty \@M #5\@@par}%
    \endgroup
  \else
    \def\@svsechd{#4{\hskip #1\relax #5}}%
  \fi
  \@xsect{#3}}
```

And hyperref

```
\let\@footnotemark@nolink\@footnotemark
\let\@footnotetext@nolink\@footnotetext
\RequirePackage[bookmarksnumbered,unicode]{hyperref}
\pdfstringdefDisableCommands{%
  \def\unskip{}
  \def\textbullet{- }
  \def\textrightarrow{ -> }
  \def\footnotemark{}
}
\urlstyle{rm}
\ifcase\ACM@format@nr
\relax % manuscript
\or % acmsmall
\or % acmlarge
\or % acmtog
\or % sigconf
\or % siggraph
\or % sigplan
  \urlstyle{sf}
\or % sigchi
\or % sigchi-a
  \urlstyle{sf}
\fi
\if@ACM@screen
  \hypersetup{colorlinks,
    linkcolor=ACMRed,
    citecolor=ACMPurple,
    urlcolor=ACMDarkBlue,
    filecolor=ACMDarkBlue}
\else
  \hypersetup{hidelinks}
\fi
```

Bibliography mangling.

```
\if@ACM@natbib
  \let\citeN\cite
  \let\cite\citep
  \let\citeANP\citeauthor
  \let\citeNN\citeyearpar
  \let\citeyearNP\citeyear
  \let\citeyear\citeyearpar
```

```
  \let\citeNP\citealt
  \DeclareRobustCommand\citeA
     {\begingroup\NAT@swafalse
       \let\NAT@ctype\@ne\NAT@partrue\NAT@fullfalse\NAT@open\NAT@citetp}%
  \providecommand\newblock{}%
\else
  \providecommand\citename[1]{#1}
\fi
\def\shortcite#1{\ifNAT@numbers\cite{#1}\else\citeyear{#1}\fi}
```

`\bibliographystyle` Amsart redefines `\bibliographystyle` since it prefers AMS bibliography. We turn it back to LaTeX definition:

```
\def\bibliographystyle#1{%
  \ifx\@begindocumenthook\@undefined\else
    \expandafter\AtBeginDocument
  \fi
    {\if@filesw
       \immediate\write\@auxout{\string\bibstyle{#1}}%
     \fi}}
```

Graphics and color

```
\RequirePackage{graphicx, xcolor}
```

We define ACM colors according to [7]:

```
\definecolor[named]{ACMBlue}{cmyk}{1,0.1,0,0.1}
\definecolor[named]{ACMYellow}{cmyk}{0,0.16,1,0}
\definecolor[named]{ACMOrange}{cmyk}{0,0.42,1,0.01}
\definecolor[named]{ACMRed}{cmyk}{0,0.90,0.86,0}
\definecolor[named]{ACMLightBlue}{cmyk}{0.49,0.01,0,0}
\definecolor[named]{ACMGreen}{cmyk}{0.20,0,1,0.19}
\definecolor[named]{ACMPurple}{cmyk}{0.55,1,0,0.15}
\definecolor[named]{ACMDarkBlue}{cmyk}{1,0.58,0,0.21}
```

## 3.5 Paper size and paragraphing

We use `geometry` for dimensions

```
\RequirePackage{geometry}
\ifcase\ACM@format@nr
\relax % manuscript
   \geometry{letterpaper,head=1pc}%
\or % acmsmall
   \geometry{twoside=true,
     includeheadfoot, head=1pc, foot=2pc,
     paperwidth=6.75in, paperheight=10in,
     top=58pt, bottom=44pt, inner=46pt, outer=46pt
   }%
\or % acmlarge
   \geometry{twoside=true, head=1pc, foot=2pc,
     paperwidth=8.5in, paperheight=11in,
```

```
    includeheadfoot,
    top=78pt, bottom=114pt, inner=81pt, outer=81pt
    }%
\or % acmtog
  \geometry{twoside=true, head=1pc, foot=2pc,
    paperwidth=8.5in, paperheight=11in,
    includeheadfoot, columnsep=24pt,
    top=52pt, bottom=75pt, inner=52pt, outer=52pt
    }%
\or % sigconf
  \geometry{twoside=true, head=1pc,
    paperwidth=8.5in, paperheight=11in,
    includeheadfoot, columnsep=2pc,
    top=57pt, bottom=73pt, inner=54pt, outer=54pt
    }%
\or % siggraph
  \geometry{twoside=true, head=1pc,
    paperwidth=8.5in, paperheight=11in,
    includeheadfoot, columnsep=2pc,
    top=57pt, bottom=73pt, inner=54pt, outer=54pt
    }%
\or % sigplan
  \geometry{twoside=true, head=1pc,
    paperwidth=8.5in, paperheight=11in,
    includeheadfoot=false, columnsep=2pc,
    top=1in, bottom=1in, inner=0.75in, outer=0.75in
    }%
\or % sigchi
  \geometry{twoside=true, head=1pc,
    paperwidth=8.5in, paperheight=11in,
    includeheadfoot, columnsep=2pc,
    top=66pt, bottom=73pt, inner=54pt, outer=54pt
    }%
\or % sigchi-a
  \geometry{twoside=false, head=1pc,
    paperwidth=11in, paperheight=8.5in,
    includeheadfoot, marginparsep=72pt,
    marginparwidth=170pt, columnsep=20pt,
    top=72pt, bottom=72pt, left=314pt, right=72pt
    }%
    \@mparswitchfalse
    \reversemarginpar
\fi
```

\parindent
\parskip

### Paragraphing

```
\setlength\parindent{10\p@}
\setlength\parskip{\z@}
\ifcase\ACM@format@nr
\relax % manuscript
\or % acmsmall
```

```
\or % acmlarge
\or % acmtog
  \setlength\parindent{9\p@}%
\or % sigconf
\or % siggraph
\or % sigplan
\or % sigchi
\or % sigchi-a
\fi
```

Footnotes require some consideration. We have several layers of footnotes: front-matter footnotes, "regular" footnotes and the special insert for bibstrip. In the old ACM classes 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 bibstrip from the rest of the paper. It is a full width rule.

```
\def\copyrightpermissionfootnoterule{\kern-3\p@
  \hrule \@width \columnwidth \kern 2.6\p@}

\RequirePackage{manyfoot}
\SelectFootnoteRule[2]{copyrightpermission}
\DeclareNewFootnote{copyrightpermission}
```

`\footnoterule` Tschichold's rules:

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

`\endminipage` We do not use footnote rules in minipages

```
\def\endminipage{%
    \par
    \unskip
    \ifvoid\@mpfootins\else
      \vskip\skip\@mpfootins
      \normalcolor
      \unvbox\@mpfootins
    \fi
    \@minipagefalse   %% added 24 May 89
  \color@endgroup
  \egroup
  \expandafter\@iiiparbox\@mpargs{\unvbox\@tempboxa}}
```

`\@makefntext` We do note use indentation for footnotes

```
\def\@makefntext{\noindent\@makefnmark}
```

`\@footnotetext` In sigchi-a mode our footnotes are on the margins!

```
\if@ACM@sigchiamode
\long\def\@footnotetext#1{\marginpar{%
```

```
    \reset@font\small
    \interlinepenalty\interfootnotelinepenalty
    \protected@edef\@currentlabel{%
       \csname p@footnote\endcsname\@thefnmark
    }%
    \color@begingroup
      \@makefntext{%
        \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
    \color@endgroup}}%
\fi
```

\@mpfootnotetext We want the footnotes in minipages centered:

```
\long\def\@mpfootnotetext#1{%
  \global\setbox\@mpfootins\vbox{%
    \unvbox\@mpfootins
    \reset@font\footnotesize
    \hsize\columnwidth
    \@parboxrestore
    \protected@edef\@currentlabel
         {\csname p@mpfootnote\endcsname\@thefnmark}%
    \color@begingroup\centering
      \@makefntext{%
        \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
    \color@endgroup}}
```

\@makefnmark AMS classes use a buggy definition of \makefnmark. We revert to the standard one.

```
\def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}
```

## 3.6 Fonts

\if@ACM@newfonts Whether we load the new fonts

```
\newif\if@ACM@newfonts
\@ACM@newfontstrue
\IfFileExists{libertine.sty}{}{\ClassWarning{\@classname}{You do not
    have libertine package installed.  Please upgrade your
    TeX}\@ACM@newfontsfalse}
\IfFileExists{zi4.sty}{}{\ClassWarning{\@classname}{You do not
   have zi4 package installed.  Please upgrade your TeX}\@ACM@newfontsfalse}
\IfFileExists{newtxmath.sty}{}{\ClassWarning{\@classname}{You do not
    have newtxmath package installed.  Please upgrade your
    TeX}\@ACM@newfontsfalse}
```

We use Libertine throughout.

```
\if@ACM@newfonts
\RequirePackage[tt=false]{libertine}
\RequirePackage[varqu]{zi4}
\RequirePackage[libertine]{newtxmath}
\fi
```

The SIGCHI extended abstracts are sans serif:

```
\if@ACM@sigchiamode
  \renewcommand{\familydefault}{\sfdefault}
\fi
```

## 3.7 Floats

We use caption package

```
\RequirePackage{caption, float}
\captionsetup[table]{position=top}
\if@ACM@journal
  \captionsetup{labelfont={sf, small},
    textfont={sf, small},  margin=\z@}
  \captionsetup[figure]{name={Fig.}}
\else
  \captionsetup{labelfont={bf},
    textfont={bf}, labelsep=colon, margin=\z@}
  \ifcase\ACM@format@nr
  \relax % manuscript
  \or % acmsmall
  \or % acmlarge
  \or % acmtog
  \or % sigconf
  \or % siggraph
    \captionsetup{textfont={it}}
  \or % sigplan
    \captionsetup{labelfont={bf},
      textfont={normalfont}, labelsep=period, margin=\z@}
  \or % sigchi
    \captionsetup[figure]{labelfont={bf, small},
      textfont={bf, small}}
  \or % sigchi-a
    \captionsetup[figure]{labelfont={bf, small},
      textfont={bf, small}}
  \fi
\fi
```

`sidebar` The sidebar environment:

```
\newfloat{sidebar}{}{sbar}
\floatname{sidebar}{Sidebar}
\renewenvironment{sidebar}{\Collect@Body\@sidebar}{}
```

`\@sidebar` The processing of the saved text

```
\long\def\@sidebar#1{\bgroup\captionsetup{type=sidebar}%
  \marginpar{\small#1}\egroup}
```

`marginfigure` The marginfigure environment:

```
\newenvironment{marginfigure}{\Collect@Body\@marginfigure}{}
```

`\@marginfigure` The processing of the saved text

```
\long\def\@marginfigure#1{\bgroup\captionsetup{type=figure}%
  \marginpar{\centering\small#1}\egroup}
```

`margintable` The margintable environment:

```
\newenvironment{margintable}{\Collect@Body\@margintable}{}
```

`\@margintable` The processing of the saved text

```
\long\def\@margintable#1{\bgroup\captionsetup{type=table}%
  \marginpar{\centering\small#1}\egroup}
```

SIGCHI extended abstract provides an interesting possibility to push into the margin. Here we use `figure*` and `table*` for this.

`\fulltextwidth` We define the width of the boxes as

```
\newdimen\fulltextwidth
\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)

```
\if@ACM@sigchiamode
\def\@dblfloat{\bgroup\columnwidth=\fulltextwidth
  \let\@endfloatbox\@endwidefloatbox
  \def\@fpsadddefault{\def\@fps{tp}}%
  \@float}
\fi
```

`\end@dblfloat` And the end. Just adding a `\bgroup`.

```
\if@ACM@sigchiamode
\def\end@dblfloat{%
    \end@float\egroup}
\fi
```

`\@endwidefloatbox` This is the end of a wide box - we basically move everything to the left

```
\def\@endwidefloatbox{%
  \par\vskip\z@skip
  \@minipagefalse
  \outer@nobreak
  \egroup
  \color@endbox
  \global\setbox\@currbox=\vbox{\moveleft
    \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
  \wd\@currbox=\textwidth
}
```

## 3.8 Lists

```
\ifcase\ACM@format@nr
\relax % manuscript
\or % acmsmall
\or % acmlarge
\or % acmtog
\or % sigconf
\or % siggraph
\or % sigplan
\def\labelenumi{\theenumi.}
\def\labelenumii{\theenumii.}
\def\labelenumiii{\theenumiii.}
\def\labelenumiv{\theenumiv.}
\or % sigchi
\or % sigchi-a
\fi
```

`\descriptionlabel` We do not use default colon as `\amsart` does:

```
\renewcommand{\descriptionlabel}[1]{\hspace\labelsep \upshape\bfseries #1}
```

`\description` AMS uses additional indent of 6pt. Frank recommends dropping it.

```
\renewenvironment{description}{\list{}{%
    \itemindent-12\p@
    \labelwidth\z@ \let\makelabel\descriptionlabel}%
}{
  \endlist
}
\let\enddescription=\endlist % for efficiency
```

## 3.9 Top matter data

We use keyval interface to define journal title and relevant information

```
\define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
  CIE,%
  CSUR,%
  IMWUT,%
  JACM,%
  JDIQ,%
  JEA,%
  JERIC,%
  JETC,%
  JOCCH,%
  PACMPL,%
  TAAS,%
  TACCESS,%
  TACO,%
  TALG,%
  TALLIP,%
  TAP,%
```

```
  TCPS,%
  TEAC,%
  TECS,%
  TIIS,%
  TISSEC,%
  TIST,%
  TKDD,%
  TMIS,%
  TOCE,%
  TOCHI,%
  TOCL,%
  TOCS,%
  TOCT,%
  TODAES,%
  TODS,%
  TOG,%
  TOIS,%
  TOIT,%
  TOMACS,%
  TOMM,%
  TOMPECS,%
  TOMS,%
  TOPC,%
  TOPS,%
  TOPLAS,%
  TOS,%
  TOSEM,%
  TOSN,%
  TRETS,%
  TSAS,%
  TSC,%
  TSLP,%
  TWEB%
}{%
\ifcase\@journalCode@nr
\relax % CIE
  \def\@journalName{ACM Computers in Entertainment}%
  \def\@journalNameShort{ACM Comput. Entertain.}%
  \def\@permissionCodeOne{1544-3574}%
\or % CSUR
  \def\@journalName{ACM Computing Surveys}%
  \def\@journalNameShort{ACM Comput. Surv.}%
  \def\@permissionCodeOne{0360-0300}%
\or % IMWUT
  \def\@journalName{PACM on Interactive, Mobile, Wearable and
    Ubiquitous Technologies}%
  \def\@journalNameShort{PACM Interact. Mob. Wearable Ubiquitous Technol.}%
  \def\@permissionCodeOne{2474-9567}%
\or % JACM
  \def\@journalName{Journal of the ACM}%
```

```
  \def\@journalNameShort{J. ACM}%
  \def\@permissionCodeOne{0004-5411}%
\or % JDIQ
  \def\@journalName{ACM Journal of Data and Information Quality}%
  \def\@journalNameShort{ACM J. Data Inform. Quality}%
  \def\@permissionCodeOne{1936-1955}%
\or % JEA
  \def\@journalName{ACM Journal of Experimental Algorithmics}%
  \def\@journalNameShort{ACM J. Exp. Algor.}%
  \def\@permissionCodeOne{1084-6654}%
\or % JERIC
  \def\@journalName{ACM Journal of Educational Resources in Computing}%
  \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
  \def\@permissionCodeOne{1073-0516}%
\or % JETC
  \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
  \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
  \def\@permissionCodeOne{1550-4832}%
\or % JOCCH
  \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
  \def\@journalName{ACM J. Comput. Cult. Herit.}%
\or % PACMPL
  \def\@journalName{PACM on Programming Languages}%
  \def\@journalName{PACM Progr. Lang.}%
  \def\@permissionCodeOne{2475-1421}%
\or % TAAS
  \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
  \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
  \def\@permissionCodeOne{1556-4665}%
\or % TACCESS
  \def\@journalName{ACM Transactions on Accessible Computing}%
  \def\@journalNameShort{ACM Trans. Access. Comput.}%
  \def\@permissionCodeOne{1936-7228}%
\or % TACO
  \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
\or % TALG
  \def\@journalName{ACM Transactions on Algorithms}%
  \def\@journalNameShort{ACM Trans. Algor.}%
  \def\@permissionCodeOne{1549-6325}%
\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}%
\or % TAP
  \def\@journalName{ACM Transactions on Applied Perception}%
\or % TCPS
  \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
\or % TEAC
  \def\@journalName{ACM Transactions on Economics and Computation}%
\or % TECS
```

```
  \def\@journalName{ACM Transactions on Embedded Computing Systems}%
  \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
  \def\@permissionCodeOne{1539-9087}%
\or % TIIS
  \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
  \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
  \def\@permissionCodeOne{2160-6455}%
\or % TISSEC
  \def\@journalName{ACM Transactions on Information and System Security}%
  \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
  \def\@permissionCodeOne{1094-9224}%
\or % TIST
  \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
  \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
  \def\@permissionCodeOne{2157-6904}%
\or % TKDD
  \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
  \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
  \def\@permissionCodeOne{1556-4681}%
\or % TMIS
  \def\@journalName{ACM Transactions on Management Information Systems}%
  \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
  \def\@permissionCodeOne{2158-656X}%
\or % TOCE
  \def\@journalName{ACM Transactions on Computing Education}%
  \def\@journalNameShort{ACM Trans. Comput. Educ.}%
  \def\@permissionCodeOne{1946-6226}%
\or % TOCHI
  \def\@journalName{ACM Transactions on Computer-Human Interaction}%
  \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
  \def\@permissionCodeOne{1073-0516}%
\or % TOCL
  \def\@journalName{ACM Transactions on Computational Logic}%
  \def\@journalNameShort{ACM Trans. Comput. Logic}%
  \def\@permissionCodeOne{1529-3785}%
\or % TOCS
  \def\@journalName{ACM Transactions on Computer Systems}%
  \def\@journalNameShort{ACM Trans. Comput. Syst.}%
  \def\@permissionCodeOne{0734-2071}%
\or % TOCT
  \def\@journalName{ACM Transactions on Computation Theory}%
  \def\@journalNameShort{ACM Trans. Comput. Theory}%
  \def\@permissionCodeOne{1942-3454}%
\or % TODAES
  \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
  \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
  \def\@permissionCodeOne{1084-4309}%
\or % TODS
  \def\@journalName{ACM Transactions on Database Systems}%
  \def\@journalNameShort{ACM Trans. Datab. Syst.}%
```

```
  \def\@permissionCodeOne{0362-5915}%
\or % TOG
  \def\@journalName{ACM Transactions on Graphics}%
  \def\@journalNameShort{ACM Trans. Graph.}%
  \def\@permissionCodeOne{0730-0301}
\or % TOIS
  \def\@journalName{ACM Transactions on Information Systems}%
  \def\@journalName{ACM Transactions on Information Systems}%
  \def\@permissionCodeOne{1046-8188}%
\or % TOIT
  \def\@journalName{ACM Transactions on Internet Technology}%
  \def\@journalNameShort{ACM Trans. Internet Technol.}%
  \def\@permissionCodeOne{1533-5399}%
\or % TOMACS
  \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
  \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
  \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
\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}%
\or % TOMPECS
  \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
  \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
  \def\@permissionCodeOne{2376-3639}%
\or % TOMS
  \def\@journalName{ACM Transactions on Mathematical Software}%
  \def\@journalNameShort{ACM Trans. Math. Softw.}%
  \def\@permissionCodeOne{0098-3500}%
\or % TOPC
  \def\@journalName{ACM Transactions on Parallel Computing}%
  \def\@journalNameShort{ACM Trans. Parallel Comput.}%
  \def\@permissionCodeOne{1539-9087}%
\or % TOPS
  \def\@journalName{ACM Transactions on Privacy and Security}%
  \def\@journalNameShort{ACM Trans. Priv. Sec.}%
  \def\@permissionCodeOne{2471-2566}%
\or % TOPLAS
  \def\@journalName{ACM Transactions on Programming Languages and Systems}%
  \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
  \def\@permissionCodeOne{0164-0925}%
\or % TOS
  \def\@journalName{ACM Transactions on Storage}%
  \def\@journalNameShort{ACM Trans. Storage}%
  \def\@permissionCodeOne{1553-3077}%
\or % TOSEM
  \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
  \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
  \def\@permissionCodeOne{1049-331X}%
```

```
\or % TOSN
  \def\@journalName{ACM Transactions on Sensor Networks}%
  \def\@journalNameShort{ACM Trans. Sensor Netw.}%
  \def\@permissionCodeOne{1550-4859}%
\or % TRETS
  \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
  \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
  \def\@permissionCodeOne{1936-7406}%
\or % TSAS
  \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
  \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
  \def\@permissionCodeOne{2374-0353}%
\or % TSC
  \def\@journalName{ACM Transactions on Social Computing}%
  \def\@journalNameShort{ACM Trans. Soc. Comput.}%
  \def\@permissionCodeOne{2469-7818}%
\or % TSLP
  \def\@journalName{ACM Transactions on Speech and Language Processing}%
  \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
  \def\@permissionCodeOne{1550-4875}%
\or % TWEB
  \def\@journalName{ACM Transactions on the Web}%
  \def\@journalNameShort{ACM Trans. Web}%
  \def\@permissionCodeOne{1559-1131}%
\fi
\ClassInfo{\@classname}{Using journal code \@journalCode}%
}{%
  \ClassError{\@classname}{Incorrect journal #1}%
}%
```

`\acmJournal` And the syntactic sugar around it

```
\def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}}
```

The defaults:

```
\def\@journalCode@nr{0}
\def\@journalName{}%
\def\@journalNameShort{\@journalName}%
\def\@permissionCodeOne{XXXX-XXXX}%
\def\@permissionCodeTwo{}%
```

`\acmConference` This is the conference command

```
\newcommand\acmConference[4][]{%
  \gdef\acmConference@shortname{#1}%
  \gdef\acmConference@name{#2}%
  \gdef\acmConference@date{#3}%
  \gdef\acmConference@venue{#4}%
  \ifx\acmConference@shortname\@empty
    \gdef\acmConference@shortname{#2}%
  \fi}
```

```
\acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
  DC, USA}
```

`\subtitle` The subtitle macro

```
\def\subtitle#1{\def\@subtitle{#1}}
\subtitle{}
```

`\num@authorgroups` The total number of "groups". Each group is several authors with the same affiliations(s)

```
\newcount\num@authorgroups
\num@authorgroups=0\relax
```

`\if@insideauthorgroup` Whether we are continuing an author group @insideauthorgroup insideauthorgroup-false

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

```
\renewcommand\author[2][]{%
  \if@insideauthorgroup\else
    \global\advance\num@authorgroups by 1\relax
    \global\@insideauthorgrouptrue
  \fi
  \ifx\addresses\@empty
    \if@ACM@anonymous
      \gdef\addresses{\@author{Anonymous Author(s)}}%
      \gdef\authors{Anonymous Author(s)}%
    \else
      \gdef\addresses{\@author{#2}}%
      \gdef\authors{#2}%
    \fi
  \else
    \if@ACM@anonymous\else
      \g@addto@macro\addresses{\and\@author{#2}}%
      \g@addto@macro\authors{\and#2}%
    \fi
  \fi
  \if@ACM@anonymous
    \ifx\shortauthors\@empty
      \gdef\shortauthors{Anon.}%
    \fi
  \else
    \def\@tempa{#1}%
    \ifx\@tempa\@empty
      \ifx\shortauthors\@empty
        \gdef\shortauthors{#2}%
      \else
        \g@addto@macro\shortauthors{\and#2}%
      \fi
    \else
      \ifx\shortauthors\@empty
        \gdef\shortauthors{#1}%
```

```
      \else
        \g@addto@macro\shortauthors{\and#1}%
      \fi
    \fi
  \fi}
```

`\affiliation` The macro `\affiliation` mimics `\address` from `amsart`. Note that it has an optional argument we do not currently need, but keep for the possible future use.

```
\newcommand{\affiliation}[2][]{%
  \global\@insideauthorgroupfalse
  \if@ACM@anonymous\else
    \g@addto@macro\addresses{\affiliation{#1}{#2}}%
  \fi}
```

`\email` The macro `\email` mimics `\email` from `amsart`. Agian it has an optional argument we do not currently need, but keep for the possible future use.

```
\renewcommand{\email}[2][]{%
  \if@ACM@anonymous\else
    \g@addto@macro\addresses{\email{#1}{#2}}%
  \fi}
```

`\orcid` Right now we do not typeset orcids gobble

`\@titlenotes` The titlenotes

```
\def\@titlenotes{}
```

`\titlenote` Adding note to the title

```
\def\titlenote#1{%
  \g@addto@macro\@title{\footnotemark}%
  \if@ACM@anonymous
    \g@addto@macro\@titlenotes{%
      \stepcounter{footnote}\footnotetext{Title note}}%
  \else
    \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
  \fi}
```

`\@subtitlenotes` The subtitlenotes

```
\def\@subtitlenotes{}
```

`\subtitlenote` Adding note to the subtitle

```
\def\subtitlenote#1{%
  \g@addto@macro\@subtitle{\footnotemark}%
  \if@ACM@anonymous
    \g@addto@macro\@subtitlenotes{%
      \stepcounter{footnote}\footnotetext{Subtitle note}}%
  \else
    \g@addto@macro\@subtitlenotes{%
      \stepcounter{footnote}\footnotetext{#1}}%
  \fi}
```

`\@authornotes` The authornotes

```
\def\@authornotes{}
```

`\authornote` Adding note to the author

```
\def\authornote#1{%
  \if@ACM@anonymous\else
    \g@addto@macro\addresses{\@authornotemark}
    \g@addto@macro\@authornotes{%
      \stepcounter{footnote}\footnotetext{#1}}%
  \fi}
```

`\acmVolume` The current volume

```
\def\acmVolume#1{\def\@acmVolume{#1}}
\acmVolume{1}
```

`\acmNumber` The current number

```
\def\acmNumber#1{\def\@acmNumber{#1}}
\acmNumber{1}
```

`\acmArticle` The current article

```
\def\acmArticle#1{\def\@acmArticle{#1}}
\acmArticle{1}
```

`\acmArticleSeq` The sequence number

```
\def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
\acmArticleSeq{\@acmArticle}
```

`\acmYear` The current year

```
\def\acmYear#1{\def\@acmYear{#1}}
\acmYear{2016}
```

`\acmMonth` The current month

```
\def\acmMonth#1{\def\@acmMonth{#1}}
\acmMonth{1}
```

`\@acmPubDate` The publication date

```
\def\@acmPubDate{\ifcase\@acmMonth\or
  January\or February\or March\or April\or May\or June\or
  July\or August\or September\or October\or November\or
  December\fi~\@acmYear}
```

`\acmPrice` The price

```
\def\acmPrice#1{\def\@acmPrice{#1}}
\acmPrice{15.00}
```

`\acmISBN` The book isbn

```
\def\acmISBN#1{\def\@acmISBN{#1}}
\acmISBN{978-x-xxxx-xxxx-x/YY/MM}
```

`\acmDOI` The paper doi

```
\def\acmDOI#1{\def\@acmDOI{#1}}
\acmDOI{10.1145/nnnnnnn.nnnnnnn}
```

`\if@ACM@badge` Whether to print badge. Note that either left or right badge triggers it:

```
\newif\if@ACM@badge
\@ACM@badgefalse
```

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

```
\newlength\@ACM@badge@width
\setlength\@ACM@badge@width{5pc}
```

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

```
\newlength\@ACM@title@width
```

`\@ACM@badge@skip` The space between the badge and the title

```
\newlength\@ACM@badge@skip
\setlength\@ACM@badge@skip{1pc}
```

`\acmBadgeR` Setting the right badge

```
\newcommand\acmBadgeR[2][]{\@ACM@badgetrue
  \def\@acmBadgeR@url{#1}%
  \def\@acmBadgeR@image{#2}}
\def\@acmBadgeR@url{}
\def\@acmBadgeR@image{}
```

`\acmBadgeL` Setting the left badge

```
\newcommand\acmBadgeL[2][]{\@ACM@badgetrue
  \def\@acmBadgeL@url{#1}%
  \def\@acmBadgeL@image{#2}}
\def\@acmBadgeL@url{}
\def\@acmBadgeL@image{}
```

`\startPage` The start page of the paper

```
\def\startPage#1{\def\@startPage{#1}}
\startPage{}
```

`\terms` Terms are mostly obsolete, we use CCS now. Still it makes sense to keep them for compatibility.

```
\def\terms#1{\def\@terms{#1}}
\terms{}
```

`\keywords` Keywords are mostly obsolete, we use CCS now. Still it makes sense to keep them for compatibility.

```
\def\keywords#1{\def\@keywords{#1}}
\keywords{}
```

abstract Amsart puts abstract in the box. Since we do not know whether we will use two column mode, we prefer to save the text

```
\renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
```

\@saveabstract And saving the abstract

```
\long\def\@saveabstract#1{\long\gdef\@abstract{#1}}
\@saveabstract{}
```

\@lempty The long version of \@empty (to compare with \@abstract)

```
\long\def\@lempty{}
```

\if@ACM@printccs Whether to print CCS

```
\define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
  \if@ACM@printccs
    \ClassInfo{\@classname}{Printing CCS}%
  \else
    \ClassInfo{\@classname}{Suppressing CCS}%
  \fi}{\ClassError{\@classname}{printccs must be true or false}}
```

\if@ACM@printacmref Whether to print ACM bib

```
\define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
  \if@ACM@printacmref
    \ClassInfo{\@classname}{Printing bibformat}%
  \else
    \ClassInfo{\@classname}{Suppressing bibformat}%
  \fi}{\ClassError{\@classname}{printacmref must be true or false}}
```

\if@ACM@printfolios Whether to print folios

```
\define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
  \if@ACM@printfolios
    \ClassInfo{\@classname}{Printing folios}%
  \else
    \ClassInfo{\@classname}{Suppressing folios}%
  \fi}{\ClassError{\@classname}{printfolios must be true or false}}
```

\settopmatter The usual syntactic sugar

```
\def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
```

Now the settings

```
\settopmatter{printccs=true, printacmref=true}
\if@ACM@manuscript
  \settopmatter{printfolios=true}
\else
  \if@ACM@journal
    \settopmatter{printfolios=true}
  \else
    \settopmatter{printfolios=false}
  \fi
\fi
```

\@received The container for the paper history

```
\def\@received{}
```

\received The \received command

```
\newcommand\received[2][]{\def\@tempa{#1}%
  \ifx\@tempa\@empty
    \ifx\@received\@empty
      \gdef\@received{Received #2}%
    \else
      \g@addto@macro{\@received}{; revised #2}%
    \fi
  \else
    \ifx\@received\@empty
      \gdef\@received{#1 #2}%
    \else
      \g@addto@macro{\@received}{; #1 #2}%
    \fi
  \fi}
\AtEndDocument{%
  \ifx\@received\@empty\else
    \par\bigskip\noindent\small\normalfont\@received\par
  \fi}
```

## 3.10 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```
\RequirePackage{comment}
\excludecomment{CCSXML}
```

\@concepts This is the storage macro for concepts

```
\let\@concepts\@empty
```

\ccsdesc The first argument is the significance, the second is the concept(s)

```
\newcommand\ccsdesc[2][100]{%
  \ccsdesc@parse#1~#2~}
```

\ccsdesc@parse The parser of the expression `Significance~General~Specific` (we need `textcomp` for `\\textrightarrow`:

```
\RequirePackage{textcomp}
\def\ccsdesc@parse#1~#2~#3~{%
  \expandafter\ifx\csname CCS@#2\endcsname\relax
   \expandafter\gdef\csname CCS@#2\endcsname{\textbullet\textbf{#2} \textrightarrow }%
  \g@addto@macro{\@concepts}{\csname CCS@#2\endcsname}\fi
  \expandafter\g@addto@macro\expandafter{\csname CCS@#2\endcsname}{%
    \ifnum#1>499\textbf{#3; }\else
    \ifnum#1>299\textit{#3; }\else
    #3; \fi\fi}}
```

## 3.11 Copyright system

This is from acmcopyright.sty

\if@printcopyright A flag whether to print copyright symbol

```
\newif\if@printcopyright
\@printcopyrighttrue
```

\if@printpermission Whether to print permission block

```
\newif\if@printpermission
\@printpermissiontrue
```

\if@acmowned Whether ACM ownes the rights to the paper

```
\newif\if@acmowned
\@acmownedtrue
```

Keys:

```
\define@choicekey*{ACM@}{acmcopyrightmode}[%
  \acm@copyrightinput\acm@copyrightmode]{none,acmcopyright,acmlicensed,%
  rightsretained,usgov,usgovmixed,cagov,cagovmixed,%
  licensedusgovmixed,licensedcagovmixed,othergov,licensedothergov}{%
  \@printpermissiontrue
  \@printcopyrighttrue
  \@acmownedtrue
  \ifnum\acm@copyrightmode=0\relax % none
   \@printpermissionfalse
   \@printcopyrightfalse
   \@acmownedfalse
  \fi
  \ifnum\acm@copyrightmode=2\relax % acmlicensed
   \@acmownedfalse
  \fi
  \ifnum\acm@copyrightmode=3\relax % rightsretained
   \@acmownedfalse
  \fi
  \ifnum\acm@copyrightmode=4\relax % usgov
   \@printpermissiontrue
   \@printcopyrightfalse
   \@acmownedfalse
  \fi
  \ifnum\acm@copyrightmode=6\relax % cagov
   \@acmownedfalse
  \fi
  \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
   \@acmownedfalse
  \fi
  \ifnum\acm@copyrightmode=9\relax % licensedcagovmixed
   \@acmownedfalse
  \fi
  \ifnum\acm@copyrightmode=10\relax % othergov
```

```
  \@acmownedtrue
 \fi
 \ifnum\acm@copyrightmode=11\relax % licensedothergov
  \@acmownedfalse
 \fi}
```

`\setcopyright` This is the syntactic sugar around setting keys.

```
\def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
\setcopyright{acmcopyright}
```

`\@copyrightowner` Here is the owner of the copyright

```
\def\@copyrightowner{%
 \ifcase\acm@copyrightmode\relax % none
 \or % acmcopyright
 ACM\@.
 \or % acmlicensed
 Copyright held by the owner/author(s). Publication rights licensed to
 ACM\@.
 \or % rightsretained
 Copyright held by the owner/author(s).
 \or % usgov
 \or % usgovmixed
 ACM\@.
 \or % cagov
 Crown in Right of Canada.
 \or %cagovmixed
 ACM\@.
 \or %licensedusgovmixed
 Copyright held by the owner/author(s). Publication rights licensed to
 ACM\@.
 \or %licensedcagovmixed
 Copyright held by the owner/author(s). Publication rights licensed to
 ACM\@.
 \or % othergov
 ACM\@.
 \or % licensedothergov
 Copyright held by the owner/author(s). Publication rights licensed to
 ACM\@.
 \fi}
```

`\@formatdoi` Print a clickable doi

```
\def\@formatdoi#1{\url{http://dx.doi.org/#1}}
```

`\@copyrightpermission` The canned permission block.

```
\def\@copyrightpermission{%
 \ifcase\acm@copyrightmode\relax % none
 \or % acmcopyright
  Permission to make digital or hard copies of all or part of this
  work for personal or classroom use is granted without fee provided
```

```
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 only.
\fi}
```

\copyrightyear By default, the copyright year is the same as \acmYear, but one can override this:

```
\def\copyrightyear#1{\def\@copyrightyear{#1}}
\copyrightyear{\@acmYear}
```

\@teaserfigures The teaser figures container

```
\def\@teaserfigures{}
```

teaserfigure The teaser figure

```
\newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}
```

\@saveteaser Saving the teaser

```
\long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}
```

\thanks We redefine amsart \thanks, so the anonymous key works

```
\renewcommand{\thanks}[1]{%
  \@ifnotempty{#1}{%
    \if@ACM@anonymous
      \g@addto@macro\thankses{\thanks{A note}}%
   \else
    \g@addto@macro\thankses{\thanks{#1}}%
   \fi}}
```

## 3.12 Typesetting top matter

\mktitle@bx Some of our formats use two column design, some use one column one. In all cases we use wide title. Thus we typeset the top matter in a special box to be use in the construction \@twocolumn[⟨*box*⟩].

```
\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 thankses. The latter 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.

```
\def\maketitle{%
  \if@ACM@anonymous
    % Anonymize omission of \author-s
    \ifnum\num@authorgroups=0\author{}\fi
  \fi
  \begingroup
  \let\@footnotemark\@footnotemark@nolink
  \let\@footnotetext\@footnotetext@nolink
  \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
  \@topnum\z@ % this prevents figures from falling at the top of page
              % 1
  \hsize=\textwidth
  \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
  \@mktitle\if@ACM@sigchiamode\else\@mkauthors\fi\@mkteasers
  \@printtopmatter
```

```
\if@ACM@sigchiamode\@mkauthors\fi
\setcounter{footnote}{0}%
\def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
\@titlenotes
\@subtitlenotes
\@authornotes
\let\@makefnmark\relax  \let\@thefnmark\relax
\let\@makefntext\noindent
\ifx\@empty\thankses\else
  \footnotetextcopyrightpermission{%
    \def\par{\let\par\@par}\parindent\z@\@setthanks}%
\fi
\footnotetextcopyrightpermission{\parindent\z@\parskip0.1\baselineskip
\if@ACM@authorversion\else
  \if@printpermission\@copyrightpermission\par\fi
\fi
\if@ACM@manuscript\else
  \if@ACM@journal\else % Print the conference short name
    {\itshape \acmConference@shortname, \acmConference@venue}\par
  \fi
\fi
\if@printcopyright
  \copyright\ \@copyrightyear\ \@copyrightowner\
\else
  \@copyrightyear.\
\fi
\if@ACM@manuscript
  Manuscript submitted to ACM\\
\else
  \if@ACM@authorversion
      This is the author's version of the work. It is posted here for
      your personal use. Not for redistribution. The definitive Version
      of Record was published in
      \if@ACM@journal
        \emph{\@journalName}%
      \else
        \emph{Proceedings of \acmConference@name, \acmConference@date}%
      \fi
      \ifx\@acmDOI\@empty
      .
      \else
        , \@formatdoi{\@acmDOI}.
      \fi\\
    \else
      \if@ACM@journal
        \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle\
        \$\@acmPrice\\
        DOI: \nolinkurl{\@acmDOI}%
      \else % Conference
         \@acmISBN
```

```
          \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\\
          DOI: \nolinkurl{\@acmDOI}%
       \fi
     \fi
   \fi}%
 \endgroup
 \setcounter{footnote}{0}%
 \@mkabstract
 \if@ACM@printccs
   \ifx\@concepts\@empty\else\bgroup
     {\@specialsection{CCS Concepts}%
        \@concepts\par}\egroup
    \fi
  \fi
  \if\@terms\@empty\else\bgroup
     {\@specialsection{General Terms}%
        \@terms\par}\egroup
  \fi
  \ifx\@keywords\@empty\else\bgroup
     {\if@ACM@journal
        \@specialsection{Additional Key Words and Phrases}%
      \else
        \@specialsection{Keywords}%
      \fi
        \@keywords}\par\egroup
  \fi
 \andify\authors
 \andify\shortauthors
 \global\let\authors=\authors
 \global\let\shortauthors=\shortauthors
 \if@ACM@printacmref
    \@mkbibcitation
 \fi
 \hypersetup{pdfauthor={\authors},
   pdftitle={\@title}, pdfkeywords={\@concepts}}%
 \@printendtopmatter
 \@afterindentfalse
 \@afterheading
}
```

`\@specialsection` This macro starts section for proceedings and uses small for journals

```
\def\@specialsection#1{%
 \ifcase\ACM@format@nr
 \relax % manuscript
   \par\medskip\small\noindent#1: %
 \or % acmsmall
   \par\medskip\small\noindent#1: %
 \or % acmlarge
   \par\medskip\small\noindent#1: %
 \or % acmtog
```

```
    \par\medskip\small\noindent#1: %
  \or % sigconf
    \section*{#1}%
  \or % siggraph
    \section*{#1}%
  \or % sigplan
    \paragraph*{#1}%
  \or % sigchi
    \section*{#1}%
  \or % sigchi-a
    \section*{#1}%
  \fi}
```

`\@printtopmatter` The printing of top matter starts the 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 on the margins.

```
\def\@printtopmatter{%
  \ifx\@startPage\@empty
     \gdef\@startPage{1}%
  \else
     \setcounter{page}{\@startPage}%
  \fi
  \thispagestyle{firstpagestyle}%
  \noindent
  \ifcase\ACM@format@nr
  \relax % manuscript
    \box\mktitle@bx\par
    \noindent\hrulefill\par
  \or % acmsmall
    \box\mktitle@bx\par
    \noindent\hrulefill\par
  \or % acmlarge
    \box\mktitle@bx\par
    \noindent\hrulefill\par
  \or % acmtog
    \twocolumn[\box\mktitle@bx]%
  \or % sigconf
    \twocolumn[\box\mktitle@bx]%
  \or % siggraph
    \twocolumn[\box\mktitle@bx]%
  \or % sigplan
    \twocolumn[\box\mktitle@bx]%
  \or % sigchi
    \twocolumn[\box\mktitle@bx]%
  \or % sigchi-a
    \par\box\mktitle@bx\par\bigskip
    \if@ACM@badge
       \marginpar{\noindent
         \ifx\@acmBadgeL@image\@empty\else
           \href{\@acmBadgeL@url}{%
```

```
              \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
            \hskip\@ACM@badge@skip
          \fi
         \ifx\@acmBadgeR@image\@empty\else
           \href{\@acmBadgeR@url}{%
             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
          \fi}%
    \fi
  \fi
}
```

\@mktitle The title of the article

```
\def\@mktitle{%
  \ifcase\ACM@format@nr
  \relax % manuscript
    \@mktitle@i
  \or % acmsmall
    \@mktitle@i
  \or % acmlarge
    \@mktitle@i
  \or % acmtog
    \@mktitle@i
  \or % sigconf
    \@mktitle@iii
  \or % siggraph
    \@mktitle@iii
  \or % sigplan
    \@mktitle@iii
  \or % sigchi
    \@mktitle@iii
  \or % sigchi-a
    \@mktitle@iv
  \fi
}
```

\@titlefont The font to typeset title

```
\def\@titlefont{%
  \ifcase\ACM@format@nr
  \relax % manuscript
    \LARGE\bfseries\sffamily
  \or % acmsmall
    \LARGE\bfseries\sffamily
  \or % acmlarge
    \LARGE\bfseries\sffamily
  \or % acmtog
    \Huge\sffamily
  \or % sigconf
    \Huge\sffamily\bfseries
  \or % siggraph
    \Huge\sffamily\bfseries
```

```
  \or % sigplan
    \Huge\bfseries
  \or % sigchi
    \Huge\sffamily\bfseries
  \or % sigchi-a
     \Huge\bfseries
  \fi}
```

`\@subtitlefont` The font to typeset title

```
\def\@subtitlefont{%
  \ifcase\ACM@format@nr
  \relax % manuscript
    \mdseries
  \or % acmsmall
    \mdseries
  \or % acmlarge
    \mdseries
  \or % acmtog
     \LARGE
  \or % sigconf
     \LARGE\mdseries
  \or % siggraph
     \LARGE\mdseries
  \or % sigplan
     \LARGE\mdseries
  \or % sigchi
     \LARGE\mdseries
  \or % sigchi-a
     \mdseries
  \fi}
```

`\@mktitle@i` The version of `\mktitle` for most journals

```
\def\@mktitle@i{\hsize=\textwidth
  \@ACM@title@width=\hsize
  \ifx\@acmBadgeL@image\@empty\else
    \advance\@ACM@title@width by -\@ACM@badge@width
    \advance\@ACM@title@width by -\@ACM@badge@skip
  \fi
  \ifx\@acmBadgeR@image\@empty\else
    \advance\@ACM@title@width by -\@ACM@badge@width
    \advance\@ACM@title@width by -\@ACM@badge@skip
  \fi
  \setbox\mktitle@bx=\vbox{\noindent\@titlefont
    \ifx\@acmBadgeL@image\@empty\else
      \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
          \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
      \hskip\@ACM@badge@skip
    \fi
    \parbox[t]{\@ACM@title@width}{\raggedright
      \@titlefont\noindent
```

```
      \@title
  \ifx\@subtitle\@empty\else
    \par\noindent{\@subtitlefont\@subtitle}
  \fi}%
  \ifx\@acmBadgeR@image\@empty\else
    \hskip\@ACM@badge@skip
    \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
        \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
  \fi
  \par\bigskip}}%
```

`\@mktitle@ii` The version of `\mktitle` for TOG. Since v1.06 is subsumed by the `\mktitle@i` macro

`\@mktitle@iii` The version of `\@mktitle` for sigproc. Note that since the title is centered, we leave the space for the left badge even if only the right badge is defined.

```
\def\@mktitle@iii{\hsize=\textwidth
    \setbox\mktitle@bx=\vbox{\@titlefont\centering
      \@ACM@title@width=\hsize
      \if@ACM@badge
        \advance\@ACM@title@width by -2\@ACM@badge@width
        \advance\@ACM@title@width by -2\@ACM@badge@skip
        \parbox[b]{\@ACM@badge@width}{\strut
          \ifx\@acmBadgeL@image\@empty\else
            \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
          \fi}%
        \hskip\@ACM@badge@skip
      \fi
      \parbox[t]{\@ACM@title@width}{\centering\@titlefont
        \@title
        \ifx\@subtitle\@empty\else
          \par\noindent{\@subtitlefont\@subtitle}
        \fi
      }%
      \if@ACM@badge
        \hskip\@ACM@badge@skip
        \parbox[b]{\@ACM@badge@width}{\strut
          \ifx\@acmBadgeR@image\@empty\else
            \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
          \fi}%
      \fi
      \par\bigskip}}%
```

`\@mktitle@iv` The version of `\@mktitle` for sigchi-a

```
\def\@mktitle@iv{\hsize=\textwidth
    \setbox\mktitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
      \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
      \noindent\@title
     \ifx\@subtitle\@empty\else
```

```
      \par\noindent\@subtitlefont\@subtitle
    \fi
    \par\bigskip}}%
```

`\@ACM@addtoaddress` The macro adds an item to address using the following rules:

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

```
\newbox\@ACM@commabox
\def\@ACM@addtoaddress#1{%
  \ifvmode\else
    \setbox\@ACM@commabox=\hbox{, }%
    \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
  \fi
  #1}
```

`\institution` `\position` `\department` `\streetaddress` `\city` `\state` `\postcode` `\country` 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…

We follow the strange American tradtion of no comma before zip code.

```
\if@ACM@journal
  \let\position\@gobble
  \def\institution#1{#1\ignorespaces}%
  \let\department\@gobble
  \let\streetaddress\@gobble
  \let\city\@gobble
  \let\state\@gobble
  \let\postcode\@gobble
  \let\country\@gobble
\else
  \def\position#1{#1\par}%
  \def\institution#1{#1\par}%
  \def\department#1{#1\par}%
  \def\streetaddress#1{#1\par}%
  \let\city\@ACM@addtoaddress
  \let\state\@ACM@addtoaddress
  \def\postcode#1{\unskip\space#1}%
  \let\country\@ACM@addtoaddress
\fi
```

`\@mkauthors` Typesetting authors

```
\def\@mkauthors{\begingroup
  \hsize=\textwidth
  \ifcase\ACM@format@nr
  \relax % manuscript
```

```
    \@mkauthors@i
  \or % acmsmall
    \@mkauthors@i
  \or % acmlarge
    \@mkauthors@i
  \or % acmtog
    \@mkauthors@i
  \or % sigconf
    \@mkauthors@iii
  \or % siggraph
    \@mkauthors@iii
  \or % sigplan
    \@mkauthors@iii
  \or % sigchi
    \@mkauthors@iii
  \or % sigchi-a
    \@mkauthors@iv
  \fi
  \endgroup
}
```

`\@authorfont` Somehow different conferences use different fonts for author names. Why?

```
\def\@authorfont{\Large\sffamily}
```

`\@affiliationfont` Font for affiliations

```
\def\@affiliationfont{\normalsize\normalfont}
```

Adjusting fonts for different formats

```
\ifcase\ACM@format@nr
\relax % manuscript
\or % acmsmall
  \def\@authorfont{\large\sffamily}
  \def\@affiliationfont{\small\normalfont}
\or % acmlarge
\or % acmtog
  \def\@authorfont{\LARGE\sffamily}
  \def\@affiliationfont{\large}
\or % sigconf
  \def\@authorfont{\LARGE}
  \def\@affiliationfont{\large}
\or % siggraph
  \def\@authorfont{\normalsize\normalfont}
  \def\@affiliationfont{\normalsize\normalfont}
\or % sigplan
  \def\@authorfont{\Large\normalfont}
  \def\@affiliationfont{\normalsize\normalfont}
\or % sigchi
  \def\@authorfont{\bfseries}
  \def\@affiliationfont{\mdseries}
```

```
\or % sigchi-a
  \def\@authorfont{\bfseries}
  \def\@affiliationfont{\mdseries}
\fi
```

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

```
\def\@typeset@author@line{%
  \andify\@currentauthors\par\noindent
  \@currentauthors\def\@currentauthors{}%
  \ifx\@currentaffiliations\@empty\else
    \andify\@currentaffiliations
      \unskip, {\@currentaffiliations}\par
  \fi
  \def\@currentaffiliations{}}
```

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

```
\def\@mkauthors@i{%
  \def\@currentauthors{}%
  \def\@currentaffiliations{}%
  \global\let\and\@typeset@author@line
  \def\@author##1{%
    \ifx\@currentauthors\@empty
      \gdef\@currentauthors{\@authorfont\MakeUppercase{##1}}%
    \else
       \g@addto@macro{\@currentauthors}{\and\MakeUppercase{##1}}%
    \fi
    \gdef\and{}}%
  \def\email##1##2{}%
  \def\affiliation##1##2{%
    \def\@tempa{##2}\ifx\@tempa\@empty\else
       \ifx\@currentaffiliations\@empty
          \gdef\@currentaffiliations{\@affiliationfont##2}%
       \else
         \g@addto@macro{\@currentaffiliations}{\and##2}%
      \fi
    \fi
     \global\let\and\@typeset@author@line}
  \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
    \noindent\addresses\@typeset@author@line
   \par\medskip}%
}
```

`\@mkauthors@ii` `\@mkauthors@iI` was version used in acmtog. No longer necessary

`\author@bx` The box to put individual author to

```
\newbox\author@bx
```

\author@bx@wd The width of the author box

```
\newdimen\author@bx@wd
```

\author@bx@sep The separation between the author boxes

```
\newskip\author@bx@sep
\author@bx@sep=1pc\relax
```

\@typeset@author@bx Typesetting the box with authors. Note that in SIGCHI-A the box is not centered.

```
\def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd\def\and{\par}%
  \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
    \@authorfont\@currentauthors\par\@affiliationfont
    \@currentaffiliation}\egroup
  \box\author@bx\hspace{\author@bx@sep}%
  \gdef\@currentauthors{}%
  \gdef\@currentaffiliation{}}
```

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

```
\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 (`\textwidth` − `\author@bx@sep`)/$N$ − `\author@bx@sep`, where $N$ is the number of boxes per row.

```
  \author@bx@wd=\textwidth\relax
  \advance\author@bx@wd by -\author@bx@sep\relax
  \ifcase\num@authorgroups
  \relax % 0?
  \or  % 1=one author per row
  \or  % 2=two authors per row
     \divide\author@bx@wd by \num@authorgroups\relax
  \or  % 3=three authors per row
     \divide\author@bx@wd by \num@authorgroups\relax
  \or  % 4=two authors per row (!)
     \divide\author@bx@wd by 2\relax
  \else % three authors per row
     \divide\author@bx@wd by 3\relax
  \fi
  \advance\author@bx@wd by -\author@bx@sep\relax
```

Now, parsing of `\addresses`:

```
  \gdef\@currentauthors{}%
  \gdef\@currentaffiliation{}%
  \def\@author##1{\ifx\@currentauthors\@empty
    \gdef\@currentauthors{\par##1}%
  \else
    \g@addto@macro\@currentauthors{\par##1}%
  \fi
  \gdef\and{}}%
  \def\email##1##2{\ifx\@currentaffiliation\@empty
    \gdef\@currentaffiliation{\nolinkurl{##2}}%
```

```
  \else
    \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
  \fi}%
  \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
    \gdef\@currentaffiliation{##2}%
  \else
    \g@addto@macro\@currentaffiliation{\par##2}%
  \fi
  \global\let\and\@typeset@author@bx
}%
```

Actual typesetting is done by \and macro:

```
  \hsize=\textwidth
  \global\setbox\mktitle@bx=\vbox{\noindent
    \box\mktitle@bx\par\medskip\leavevmode
    \lineskip=1pc\relax\centering\hspace*{-1em}%
    \addresses\let\and\@typeset@author@bx\and\par\bigskip}}
```

\@mkauthors@iv The sigchia version. Now we put authors in the main text, and no more than 2 authors per line.

```
\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 (\textwidth − \author@bx@sep)/$N$ − \author@bx@sep, where $N$ is the number of boxes per row.

```
  \author@bx@wd=\columnwidth\relax
  \advance\author@bx@wd by -\author@bx@sep\relax
  \ifcase\num@authorgroups
  \relax % 0?
  \or  % 1=one author per row
  \else  % 2=two authors per row
     \divide\author@bx@wd by 2\relax
  \fi
  \advance\author@bx@wd by -\author@bx@sep\relax
```

Now, parsing of \addresses:

```
  \gdef\@currentauthors{}%
  \gdef\@currentaffiliation{}%
  \def\@author##1{\ifx\@currentauthors\@empty
    \gdef\@currentauthors{\par##1}%
  \else
    \g@addto@macro\@currentauthors{\par##1}%
  \fi
  \gdef\and{}}%
  \def\email##1##2{\ifx\@currentaffiliation\@empty
    \gdef\@currentaffiliation{\nolinkurl{##2}}%
  \else
    \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
  \fi}%
```

```
\def\affiliation##1##2{\ifx\@currentaffiliation\@empty
  \gdef\@currentaffiliation{##2}%
\else
  \g@addto@macro\@currentaffiliation{\par##2}%
\fi
\global\let\and\@typeset@author@bx}%
%
```

Actual typesetting is done by \and macro

```
    \bgroup\hsize=\columnwidth
    \par\raggedright\leftskip=\z@
    \lineskip=1pc\noindent
    \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}
```

\@authornotemark Adding footnotemark to authors

```
\def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark}}
```

\@mkteasers Typesetting teasers

```
\def\@mkteasers{%
  \ifx\@teaserfigures\@empty\else
    \def\@teaser##1{\par\bigskip\bgroup
      \captionsetup{type=figure}##1\egroup\par}
    \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
    \noindent\@teaserfigures\par\medskip}%
  \fi}
```

\@setaddresses This is an amsart macro, which we do not need.

```
\def\@setaddresses{}
```

\@mkabstract Typesetting abstract

```
\def\@mkabstract{\bgroup
  \ifx\@abstract\@lempty\else
  {\if@ACM@journal
       \small\noindent
    \else
      \section*{Abstract}%
    \fi
   \phantomsection\addcontentsline{toc}{section}{Abstract}%
   \ignorespaces\@abstract\par}%
  \fi\egroup}
```

\@mkbibcitation Print bibcitation format

```
\def\@mkbibcitation{\bgroup
  \def\footnotemark{}%
  \par\medskip\small\noindent{\bfseries ACM Reference format:}\par\nobreak
  \noindent\authors. \@acmYear. \@title.
  \if@ACM@journal
     \textit{\@journalNameShort}
     \@acmVolume, \@acmNumber, Article~\@acmArticle\ (\@acmPubDate),
```

```
    \ref{TotPages}~pages.
  \else
    In \textit{Proceedings of \acmConference@name, \acmConference@venue,
      \acmConference@date
      \ifx\acmConference@name\acmConference@shortname\else
        \ (\acmConference@shortname)\fi
        ,} \ref{TotPages}~pages.
  \fi\par
  \noindent DOI: \nolinkurl{\@acmDOI}
\par\egroup}
```

`\@printendtopmatter` End the top matter

```
\def\@printendtopmatter{\par\medskip
  \ifcase\ACM@format@nr
  \relax % manuscript
    \noindent\hrulefill\par\medskip
  \or % acmsmall
    \noindent\hrulefill\par\medskip
  \or % acmlarge
    \noindent\hrulefill\par\medskip
  \or % acmtog
    \par\bigskip
  \or % sigconf
    \par\bigskip
  \or % siggraph
    \par\bigskip
  \or % sigplan
    \par\bigskip
  \or % sigchi
    \par\bigskip
  \or % sigchi-a
  \fi
}
```

`\@setthanks` We redefine `\setthanks` using `\long`

```
\def\@setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thankses}
```

## 3.13 Headers and Footers

We use `fancyhdr` for our headers and footers:

```
\RequirePackage{fancyhdr}
```

`\ACM@linecount@bx` This is the box displayed in the review mode

```
\if@ACM@review
  \newsavebox{\ACM@linecount@bx}
  \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{%
    \newlength\ACM@linecount@bxht\setlength{\ACM@linecount@bxht}{-\baselineskip}
     \@tempcnta\@ne\relax
     \loop{\color{ACMRed}\scriptsize\the\@tempcnta}\\
```

```
      \advance\@tempcnta by \@ne
      \addtolength{\ACM@linecount@bxht}{\baselineskip}
      \ifdim\ACM@linecount@bxht<\textheight\repeat}}
\fi
```

`\ACM@linecount` How to display the box

```
\def\ACM@linecount{%
  \if@ACM@review
  \begin{picture}(0,0)%
    \put(-26,-22){\usebox{\ACM@linecount@bx}}%
  \end{picture}%
  \fi}
```

`\@shortauthors` Even if the author redefined `\shortauthors`, we do not print them in the anonymous mode in the headers:

```
\def\@shortauthors{\if@ACM@anonymous Anon.\else\shortauthors\fi}
```

`\@headfootfont` The font to typeset header and footer text.

```
\def\@headfootfont{%
  \ifcase\ACM@format@nr
  \relax % manuscript
    \sffamily
  \or % acmsmall
    \sffamily
  \or % acmlarge
    \sffamily
  \or % acmtog
    \sffamily
  \or % sigconf
    \sffamily
  \or % siggraph
    \sffamily
  \or % sigplan
    \sffamily
  \or % sigchi
    \sffamily
  \or % sigchi-a
    \sffamily
  \fi}
```

`standardpagestyle` The pagestyle for all pages but the first one

```
\fancypagestyle{standardpagestyle}{%
  \fancyhf{}%
  \renewcommand{\headrulewidth}{\z@}%
  \renewcommand{\footrulewidth}{\z@}%
  \ifcase\ACM@format@nr
  \relax % manuscript
    \fancyhead[LE]{\ACM@linecount\if@ACM@printfolios\thepage\fi}%
    \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
```

```
    \fancyhead[RE]{\@shortauthors}%
    \fancyhead[LO]{\ACM@linecount\shorttitle}%
    \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}%
  \or % acmsmall
   \fancyhead[LE]{\ACM@linecount\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
   \fancyhead[RO]{\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
    \fancyhead[RE]{\@headfootfont\@shortauthors}%
    \fancyhead[LO]{\ACM@linecount\@headfootfont\shorttitle}%
    \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
    \@acmNumber, Article \@acmArticle.  Publication date: \@acmPubDate.}%
  \or % acmlarge
    \fancyhead[LE]{\ACM@linecount\@headfootfont
     \@acmArticle:\if@ACM@printfolios\thepage\quad\textbullet\quad\fi\@shortauthors}%
    \fancyhead[LO]{\ACM@linecount}%
    \fancyhead[RO]{\@headfootfont
     \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi}%
    \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
    \@acmNumber, Article \@acmArticle.  Publication date: \@acmPubDate.}%
  \or % acmtog
    \fancyhead[LE]{\ACM@linecount\@headfootfont
     \@acmArticle:\if@ACM@printfolios\thepage\quad\textbullet\quad\fi\@shortauthors}%
    \fancyhead[LO]{\ACM@linecount}%
    \fancyhead[RO]{\@headfootfont
     \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi}%
    \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
    \@acmNumber, Article \@acmArticle.  Publication date: \@acmPubDate.}%
  \else % Proceedings
    \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
    \fancyhead[LO]{\ACM@linecount\@headfootfont\shorttitle}%
    \fancyhead[RE]{\@headfootfont\@shortauthors}%
    \fancyhead[LE]{\ACM@linecount\@headfootfont\acmConference@shortname,
      \acmConference@date, \acmConference@venue}%
    \fancyhead[RO]{\@headfootfont\acmConference@shortname,
      \acmConference@date, \acmConference@venue}%
  \fi
  \if@ACM@sigchiamode
     \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
  \fi
}
\pagestyle{standardpagestyle}
```

\@folio@wd
\@folio@ht
\@folio@voffset
\@folio@max

Folio blob width, height, offsets and max number

```
\newdimen\@folio@wd
\@folio@wd=\z@
\newdimen\@folio@ht
\@folio@ht=\z@
\newdimen\@folio@voffset
\@folio@voffset=\z@
\def\@folio@max{1}
\ifcase\ACM@format@nr
```

```
\relax % manuscript
\or % acmsmall
  \@folio@wd=45.75pt\relax
  \@folio@ht=1.25in\relax
  \@folio@voffset=.2in\relax
  \def\@folio@max{8}
\or % acmlarge
  \@folio@wd=43.25pt\relax
  \@folio@ht=79pt\relax
  \@folio@voffset=.55in\relax
  \def\@folio@max{10}
\fi
```

`\@folioblob` The macro to typeset the folio blob.

```
\def\@folioblob{\@tempcnta=\@acmArticleSeq\relax
```

First, we calculate `\@acmArticleSeq` modulo `\@folio@max`

```
  \loop
     \ifnum\@tempcnta>\@folio@max\relax
      \advance\@tempcnta by - \@folio@max
   \repeat
   \advance\@tempcnta by -1\relax
   \@tempdima=\@folio@ht\relax
   \multiply\@tempdima by \the\@tempcnta\relax
   \advance\@tempdima by -\@folio@voffset\relax
   \begin{picture}(0,0)
   \makebox[\z@]{\raisebox{-\@tempdima}{%
       \rlap{%
         \raisebox{-0.45\@folio@ht}[\z@][\z@]{%
           \rule{\@folio@wd}{\@folio@ht}}}%
       \parbox{\@folio@wd}{%
         \centering
         \textcolor{white}{\LARGE\bfseries\sffamily\@acmArticle}}}}
  \end{picture}}

```

`firstpagestyle` The pagestyle for the first page only.

```
\fancypagestyle{firstpagestyle}{%
  \fancyhf{}%
  \renewcommand{\headrulewidth}{\z@}%
  \renewcommand{\footrulewidth}{\z@}%
  \ifcase\ACM@format@nr
  \relax % manuscript
    \fancyhead[L]{\ACM@linecount}%
    \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
    \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
  \or % acmsmall
    \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
    \@acmNumber, Article \@acmArticle.  Publication date:
    \@acmPubDate.}%
```

```
    \fancyhead[LE]{\ACM@linecount\@folioblob}%
    \fancyhead[LO]{\ACM@linecount}%
    \fancyhead[RO]{\@folioblob}%
    \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
  \or % acmlarge
    \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
    \@acmNumber, Article \@acmArticle.  Publication date:
    \@acmPubDate.}%
    \fancyhead[RO]{\@folioblob}%
    \fancyhead[LE]{\ACM@linecount\@folioblob}%
    \fancyhead[LO]{\ACM@linecount}%
    \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
  \or % acmtog
    \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
    \@acmNumber, Article \@acmArticle.  Publication date:
    \@acmPubDate.}%
    \fancyhead[L]{\ACM@linecount}%
  \else % Conference proceedings
    \fancyhead[L]{\ACM@linecount}%
    \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
  \fi
}
```

## 3.14 Sectioning

Sectioning is different for different levels

```
\renewcommand\section{\@startsection{section}{1}{\z@}%
  {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
  {.25\baselineskip}%
  {\@secfont}}
\renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
  {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
  {.25\baselineskip}%
  {\@subsecfont}}
\renewcommand\subsubsection{\@startsection{subsubsection}{3}{10pt}%
  {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
  {-3.5\p@}%
  {\@subsubsecfont\@adddotafter}}
\renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
  {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
  {-3.5\p@}%
  {\@parfont\@adddotafter}}
\renewcommand\part{\@startsection{part}{9}{\z@}%
  {-10\p@ \@plus -4\p@ \@minus -2\p@}%
  {4\p@}%
  {\@parfont}}
```

`\section@raggedright` Special version of `\raggedright` compatible with `\MakeUppercase`

```
\def\section@raggedright{\@rightskip\@flushglue
```

```
  \rightskip\@rightskip
  \leftskip\z@skip
  \parindent\z@}
```

\@secfont
\@subsecfont
\@subsubsecfont
\@parfont

Fonts for sections etc. are different for different formats.

```
\def\@secfont{\sffamily\bfseries\section@raggedright\MakeUppercase}
\def\@subsecfont{\sffamily\bfseries\section@raggedright}
\def\@subsubsecfont{\sffamily\itshape}
\def\@parfont{\itshape}
\setcounter{secnumdepth}{3}
\ifcase\ACM@format@nr
\relax % manuscript
\or % acmsmall
\or % acmlarge
 \def\@secfont{\sffamily\large\section@raggedright\MakeUppercase}
 \def\@subsecfont{\sffamily\large\section@raggedright}
\or % acmtog
 \def\@secfont{\sffamily\large\section@raggedright\MakeUppercase}
 \def\@subsecfont{\sffamily\large\section@raggedright}
\or % sigconf
 \def\@secfont{\bfseries\Large\section@raggedright\MakeUppercase}
 \def\@subsecfont{\bfseries\Large\section@raggedright}
\or % siggraph
 \def\@secfont{\bfseries\sffamily\Large\section@raggedright\MakeUppercase}
 \def\@subsecfont{\bfseries\sffamily\Large\section@raggedright}
\or % sigplan
 \def\@secfont{\bfseries\Large\section@raggedright}
 \def\@subsecfont{\bfseries\section@raggedright}
 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
   {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
   {.25\baselineskip}%
   {\@subsubsecfont}}
 \def\@subsubsecfont{\bfseries\section@raggedright}
 \renewcommand\paragraph{\@startsection{paragraph}{4}{\z@}%
   {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
   {-3.5\p@}%
   {\@parfont\@addspaceafter}}
 \def\@parfont{\bfseries\itshape}
 \renewcommand\subparagraph{\@startsection{subparagraph}{5}{\z@}%
   {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
   {-3.5\p@}%
   {\@subparfont\@addspaceafter}}
 \def\@subparfont{\itshape}
\or % sigchi
 \setcounter{secnumdepth}{1}
 \def\@secfont{\bfseries\sffamily\section@raggedright\MakeUppercase}
 \def\@subsecfont{\bfseries\sffamily\section@raggedright}
\or % sigchi-a
 \setcounter{secnumdepth}{0}
 \def\@secfont{\bfseries\sffamily\section@raggedright\MakeUppercase}
```

```
  \def\@subsecfont{\bfseries\sffamily\section@raggedright}
\fi
```

`\@adddotafter` Add punctuation after the command

```
\def\@adddotafter#1{#1\@addpunct{.}}
```

`\@addspaceafter` Add space after the command

```
\def\@addspaceafter#1{#1\@addpunct{\enspace}}
```

## 3.15 Theorems

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

```
\def\@acmplainbodyfont{\itshape}
```

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

```
\def\@acmplainindent{\parindent}
```

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

```
\def\@acmplainheadfont{\scshape}
```

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

```
\def\@acmplainnotefont{\@empty}
```

Customization of `acmplain` theorem style:

```
\ifcase\ACM@format@nr
\relax % manuscript
\or % acmsmall
\or % acmlarge
\or % acmtog
\or % sigconf
\or % siggraph
\or % sigplan
  \def\@acmplainbodyfont{\itshape}
  \def\@acmplainindent{\z@}
  \def\@acmplainheadfont{\bfseries}
  \def\@acmplainnotefont{\normalfont}
\or % sigchi
\or % sigchi-a
\fi
```

`acmplain` The `acmplain` theorem style

```
\newtheoremstyle{acmplain}%
  {.5\baselineskip\@plus.2\baselineskip
    \@minus.2\baselineskip}% space above
  {.5\baselineskip\@plus.2\baselineskip
    \@minus.2\baselineskip}% space below
  {\@acmplainbodyfont}% body font
  {\@acmplainindent}% indent amount
```

```
  {\@acmplainheadfont}% head font
  {.}% punctuation after head
  {.5em}% spacing after head
 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont(#3)}}}% head spec
```

`\@acmdefinitionbodyfont` The font to typeset the `acmdefinition` theorem style body.

```
\def\@acmdefinitionbodyfont{\normalfont}
```

`\@acmdefinitionindent` The amount to indent the `acmdefinition` theorem style.

```
\def\@acmdefinitionindent{\parindent}
```

`\@acmdefinitionheadfont` The font to typeset the `acmdefinition` theorem style head.

```
\def\@acmdefinitionheadfont{\itshape}
```

`\@acmdefinitionnotefont` The font to typeset the `acmdefinition` theorem style note.

```
\def\@acmdefinitionnotefont{\@empty}
```

Customization of `acmdefinition` theorem style:

```
\ifcase\ACM@format@nr
\relax % manuscript
\or % acmsmall
\or % acmlarge
\or % acmtog
\or % sigconf
\or % siggraph
\or % sigplan
  \def\@acmdefinitionbodyfont{\normalfont}
  \def\@acmdefinitionindent{\z@}
  \def\@acmdefinitionheadfont{\bfseries}
  \def\@acmdefinitionnotefont{\normalfont}
\or % sigchi
\or % sigchi-a
\fi
```

`acmdefinition` The `acmdefinition` theorem style

```
\newtheoremstyle{acmdefinition}%
  {.5\baselineskip\@plus.2\baselineskip
    \@minus.2\baselineskip}% space above
  {.5\baselineskip\@plus.2\baselineskip
    \@minus.2\baselineskip}% space below
  {\@acmdefinitionbodyfont}% body font
  {\@acmdefinitionindent}% indent amount
  {\@acmdefinitionheadfont}% head font
  {.}% punctuation after head
  {.5em}% spacing after head
 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmdefinitionnotefont(#3)}}}% head spec
```

The definitions for theorems:

```
\theoremstyle{acmplain}
```

```
\newtheorem{theorem}{Theorem}[section]
\newtheorem{conjecture}[theorem]{Conjecture}
\newtheorem{proposition}[theorem]{Proposition}
\newtheorem{lemma}[theorem]{Lemma}
\newtheorem{corollary}[theorem]{Corollary}
\theoremstyle{acmdefinition}
\newtheorem{example}[theorem]{Example}
\newtheorem{definition}[theorem]{Definition}
\theoremstyle{acmplain}
```

`\@proofnamefont` The font to typeset the proof name.

```
\def\@proofnamefont{\scshape}
```

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

```
\def\@proofindent{\indent}
```

Customization of proof environment.

```
\ifcase\ACM@format@nr
\relax % manuscript
\or % acmsmall
\or % acmlarge
\or % acmtog
\or % sigconf
\or % siggraph
\or % sigplan
  \def\@proofnamefont{\itshape}
  \def\@proofindent{\noindent}
\or % sigchi
\or % sigchi-a
\fi
```

`proof` We want some customization of proof environment.

```
\renewenvironment{proof}[1][\proofname]{\par
  \pushQED{\qed}%
  \normalfont \topsep6\p@\@plus6\p@\relax
  \trivlist
  \item[\@proofindent\hskip\labelsep
        {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
}{%
  \popQED\endtrivlist\@endpefalse
}
```

## 3.16 Acknowledgments

`\acks` This is a `comment`-like structure

```
\specialcomment{acks}{%
  \begingroup
  \section*{Acknowledgments}
  \phantomsection\addcontentsline{toc}{section}{Acknowledgments}
```

```
}{%
  \endgroup
}
```

\grantsponsor We just typeset the name of the sponsor

```
\def\grantsponsor#1#2#3{#2}
```

\grantnum

```
\newcommand\grantnum[3][]{#3%
  \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}
```

## 3.17 Conditional typesetting

We use the comment package for conditional typesetting:

```
\if@ACM@screen
  \includecomment{screenonly}
  \excludecomment{printonly}
\else
  \excludecomment{screenonly}
  \includecomment{printonly}
\fi
\if@ACM@anonymous
  \excludecomment{anonsuppress}
  \excludecomment{acks}
\else
  \includecomment{anonsuppress}
\fi
```

## 3.18 Additional bibliography commands

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

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

## 3.19 End of Class

```
\normalsize\normalfont
```

⟨/class⟩

# References


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# Change History


v1.00

General: First released version . . . . . 22

v1.01

General: Changed hyperref colors in screen mode (closes https://github.com/borisveytsman/acmart/issues/1) . . . . . 22

Defined ACM colors . . . . . 22

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v1.02

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v1.08

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