The \texttt{acmart} document class

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1 Introduction

This is the \texttt{acmart} document class, which is based upon the earlier \texttt{acmtrans} document style. Unfortunately, the copy of \texttt{acmtrans.sty} I’m working from doesn’t contain any attributions, so I can’t properly credit the original authors, although the original style seems to have been written by Leslie Lamport, with later modifications by Andrew Appel and Rebecca Davies.

The ACM class has two new options:

\texttt{preprint} for producing a version of the paper suitable for distribution as a preprint (this is the default)

\texttt{faircopy} for producing a version of the paper suitable for submission to the ACM for publication. Currently the only difference is that figures will automatically be put on pages by themselves with appropriate labels at the bottom of the page. In the future, this may also produce other differences to facilitate copy-editing, such as typesetting the text $\texttt{\textbackslash raggedright}$ instead of fully justified.
2 The docstrip modules

This code uses the following modules:

- \texttt{2e} generate code for \LaTEX\ 2\varepsilon
- \texttt{209} generate code for \LaTEX\ 2.09
- \texttt{cls} generate a document class
- \texttt{trans} generate the \texttt{acmtrans} class
- \texttt{bib} generate the \texttt{acmbib} package
- \texttt{driver} generate a driver file for the documentation

3 The code

First we output the appropriate header information.

```
\NeedsTeXFormat{LaTeX2e}
\ProvidesClass{acmart}[\filedate\space ACM transactions class (dmj)]
\ProvidesClass{acmart}[\filedate\space ACM article class (dmj)]
```

Next we add some useful abbreviations from the \LaTEX\ 2\varepsilon kernel to the \LaTEX\ 2.09 version of the document class.

```
\@height \if@faircopy \else \@width \fi \@minus \@plus
\else \@width \fi \@minus \@plus
\fi
```

\if@faircopy
```
\newif\if@faircopy
\@faircopyfalse
```

```
\@height
\@width
\@minus
\@plus
```

\if@faircopy
```
\newif\if@faircopy
```

2
All other options are passed to the article class for processing.

\DeclareOption*{\PassOptionsToClass{\CurrentOption}{article}}
\ProcessOptions\relax
\LoadClass{article}
\twosidetrue
\mparswitchtrue
\def\ds@faircopy{\@faircopytrue}
\def\ds@preprint{\@faircopyfalse}
\def\ds@twocolumn{%
\PackageWarningNoLine{acmart}{twocolumn mode is not supported}%
}
\def\ds@draft{\overfullrule 5\p@}
\@options
\lineskip \p@
\normallineskip \p@
\let\@listi\@listI
\@ptsize{0} %needed for amssymbols.sty
\@normalsize
\renewcommand{\normalsize}{%\@setfontsize\normalsize\@xpt\@xipt
\abovedisplayskip 6\p@ \@plus2\p@ \@minus\p@
\belowdisplayskip \abovedisplayskip
\abovedisplayshortskip 6\p@ \@plus3\p@ \@minus\p@
\belowdisplayshortskip 6\p@ \@plus3\p@ \@minus\p@
\let\@listi\@listI
}
\small
\def\small{%  
\@setsize\small{11\p@}\ixpt\@ixpt
}/209
\renewcommand{\small}{%  
\@setfontsize\small@ixpt{11}%
}/2e
\abovedisplayskip 5\p@ \@plus 2\p@ \@minus \p@  
\belowdisplayskip \abovedisplayskip
\abovedisplayshortskip 5\p@ \@minus 2\p@  
\belowdisplayshortskip 5\p@ \@minus 2\p@
\def\@listi{%
\leftmargin\leftmargini  
\topsep 5\p@ \@plus 2\p@ \@minus \p@  
\parsep \z@ \@plus .7\p@  
\itemsep 1.6\p@ \@plus .8\p@
}%
}

\footnotesize
\def\footnotesize{%  
\@setsize\footnotesize{10pt}\viiipt\@viiipt
}/2e
\abovedisplayskip 4\p@ \@plus \p@  
\belowdisplayskip \abovedisplayskip
\abovedisplayshortskip 4\p@ \@minus \p@  
\belowdisplayshortskip 4\p@ \@minus \p@
\def\@listi{%
\leftmargin\leftmargini  
\topsep 4\p@ \@plus \p@  
\parsep \z@ \@plus .5\p@  
\itemsep \p@ \@plus .7\p@
}%
}

\scriptsize
\tiny
\large
\def\scriptsize{\setsize\scriptsize{8\p@}\viiipt\@viiipt}
\def\tiny{\setsize\tiny{6\p@}\vpt\@vpt}
\Large
\def\Large{\setsize\Large{14\p@}\xiipt\@xiipt}
\def\large{\setsize\large{10\p@}\xivpt\@xivpt}
\LARGE
\def\LARGE{\setsize\LARGE{20\p@}\xviiipt\@xviiipt}
\Huge
\def\Huge{\setsize\Huge{25\p@}\xxvpt\@xxvpt}
\def\huge{\setsize\huge{30\p@}\xxvpt\@xxvpt}
\renewcommand{\scriptsize}{\setsize\scriptsize\viiipt\@viiipt}
h = 2e

Added \rom for producing upright parens and numerals in italic text. The 2.09 definition of \rom is taken from amsart.sty, version 1.1b, 31 July 1991. – dmj, 4/19/96

\def\rom#1{%
\leavevmode
\skip@\lastskip
\unskip/%
\ifdim\skip@=\z@\else\hskip\skip@\fi
\{\rm#1\}%
}

\let\rom\textup
\normalsize
Set \clubpenalty and \widowpenalty to their maximum values to inhibit widows and orphans. – dmj, 4/17/96

\clubpenalty\@M
\widowpenalty\@M
\@lowpenalty 51
\@medpenalty 151
\@highpenalty 301
\@beginparpenalty -\@lowpenalty
\@endparpenalty -\@lowpenalty
\@itempenalty -\@lowpenalty
\h = 209

3.1 Section headings

\c@part
\c@section
\c@subsection
\c@subsubsection
\c@paragraph
\thepart
\thesection
\thesubsection
\thesubsubsection
\theparagraph
\@period \subsection\paragraphs\are\set\as\run\in\headings,\with\a\period\added\after\the\heading.\However,\if\the\text\immediately\following\the\\subsection\or\\paragraph\is\either\another\section\header\or\(\more\likely\)\a\list\of\some\sort,\then\the\period\should\be\omitted,\since\the\heading\will\be\put\on\a\line\by\itself.\This\is\implemented\in\a\rather\grotty\way\using\@period\and\modifying\@startsection,\@xsect,\and\@trivlist.
\let\@period=.
\def\@startsection#1#2#3#4#5#6{%
\ifnospsec
\global\let\@period\empty
\leavevmode
\global\let\@period.%
\fi
\par
Unfortunately, we're probably stuck with this. (Or we could redefine \@M :-)

It might be worthwhile defining a variant of \@startsection that first uppercases the title and then just passes everything along to \@startsection. That would make us a little more bullet-proof, since we wouldn't have to worry about tracking future changes in \@sect. But it might be more trouble than it's really
worth.

\if@uchead
  \uppercase{#8}%
\else
  #8%
\fi
\par
\endgroup
\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
    \if@uchead
      \uppercase{#8}%
    \else
      #8%
    \fi
    \csname #1mark\endcsname{#7}%
    \addcontentsline{toc}{#1}{% 
      \ifnum #2>\c@secnumdepth \else
        \protect\numberline{\csname the#1\endcsname}\%
      \fi
      #7% }
  }%
\else
  \@xsect{#5}%
\end{verbatim}

global

\global\nobreakfalse
\global\nospipsecttrue
\everypar%
  \if\nospipsec
    \global\nospipsectfalse
  \global\clubpenalty\@M
  \hskip -\parindent
Can’t we decide here whether to put the period in? Might have to introduce a new flag, though. How unpleasant.

Q. What is \period doing in \trivlist?
A. To handle the case where a \trivlist is the first item after a \subsubsection or \paragraph.
Surely there has to be a better way of handling this.
3.2 Appendices

\newcommand{\apbf}{\small\bf}
\newfont{\apbf}{cmbx9}

\@withappendix Page numbering style for appendices
\def\@withappendix#1{\rm A--\number #1}

\appendixhead
\long\def\appendixhead#1#2#3#4{\section*{Appendix}
 An appendix to this paper is available in electronic form
 \(\text{PostScript}^{\text{TM}}\). Any of the following methods
 may be used to obtain it; or see the inside back cover of a
 current issue for up-to-date instructions.
\begin{itemize}
\item By anonymous ftp from \texttt{acm.org}, file \texttt{pubs.journals.#1.append\p#2.ps}
\item Send electronic mail to \texttt{mailserve@acm.org} containing the line
\texttt{send anonymous.pubs.journals.#1.append\p#2.ps}
\item By \texttt{Gopher} from \texttt{acm.org}
\item By anonymous ftp from \texttt{ftp.cs.princeton.edu}, file \texttt{pub/#1/append/p#2.ps}
\item Hardcopy from \texttt{Article Express}, for a fee: phone 800-238-3458, fax 201-216-8526, or write P.O. Box 1801, Hoboken NJ 07030; and request \texttt{sc acm-#1-appendix-\small #2}.
\end{itemize}

\clearpage
\pagenumbering{withappendix}
\appendix
\par
\noindent this document is the appendix to the following paper:
\hfill
\vfill
\vbox{\sf \parindent \z@ \@title}
\vskip 1em
\vbox{\sf \parindent \z@ \@author}
\vskip 0.5em
\hrule \@height .2\p@
\par
\begin{bottomstuff}
\permission
\copyright #3 ACM
\end{bottomstuff}

\appendix
\def\appendix{%
\par
\part{Appendix}\%
\par
\setcounter{section}{0}\%
\setcounter{subsection}{0}\%
\def\thesection{\Alph{section}}\%
\def\thesubsection{\thesection.\arabic{subsection}}\%
\def\thesubsubsection{\thesubsection.\arabic{subsubsection}}\%
\}

3.3 Lists
\labelsep 5pt
\settowidth{\leftmargini}{(9)}
\def\@listv{
  \leftmargin\leftmarginv
  \labelwidth\leftmarginv
  \advance\labelwidth-\labelsep
}

\@listvi
\def\@listvi{
  \leftmargin\leftmarginvi
  \labelwidth\leftmarginvi
  \advance\labelwidth-\labelsep
}

\enumerate
\def\enumerate{
  \ifnum\@enumdepth>3
    \@toodeep
  \else\fi
  \advance\@enumdepth\@ne
  \edef\@enumctr{enum\romannumeral\the\@enumdepth}
  \list{\csname label\@enumctr\endcsname}{%
    \usecounter{\@enumctr}
    \def\makelabel##1{##1\hss}%
  }%
  \fi
}

\let\endenumerate\endlist

\longenum
\def\longenum{
  \ifnum\@enumdepth>3
    \@toodeep
  \else\fi
  \advance\@enumdepth\@ne
  \edef\@enumctr{enum\romannumeral\the\@enumdepth}
  \list{\csname label\@enumctr\endcsname}{%
    \usecounter{\@enumctr}
    \labelwidth\z@
  }%
  \fi
}

\let\endlongenum\endlist

\let\endlongenum\endlist
\let\endlongenum\endlist

\let\endlongenum\endlist
\let\endlongenum\endlist
\let\endlongenum\endlist

\def\labelenumi{\rom{(%arabic{enumi})}}
\def\theenumi{\arabic{enumi}}
\def\labelenumii{\rom{(%alph{enumii})}}
\def\theenumii{\alph{enumii}}

% Added \rom around all list labels. - dmj, 4/19/96
\def\labelenumi{\rom{\arabic{enumi}}}
\def\theenumi{\arabic{enumi}}
\def\labelenumii{\rom{\alph{enumii}}}
\def\theenumii{\alph{enumii}}
\def\p@enumii{\textup{\theenumi}}
\def\labelenumiii{\textup{\roman{enumiii}.}}
\def\theenumiii{\roman{enumiii}}
\def\p@enumiii{\textup{\theenumi(\theenumii)}}
\def\labelenumiv{\textup{\textbf{\Alph{enumiv}.}}}
\def\theenumiv{\Alph{enumiv}}
\def\p@enumiv{\textup{\p@enumiii\theenumiii}}

\itemize
\item \itemize{%
  \list{---\hskip -\labelsep}{%\textwidth}
  \settowidth{\leftmargin}{---}%
  \labelwidth\leftmargin
  \addtolength{\labelwidth}{-\labelsep}%
  \%}
\enditemize
\let\enditemize\endlist

\longitem (+\textit{trans})
\itemize
\item \longitem{%
  \list{---}{%\textwidth}
  \labelwidth\z@\textwidth
  \leftmargin\z@\textwidth
  \itemindent\parindent
  \advance\itemindent\labelsep
  \%}
\endlongitem
\let\endlongitem\endlist

\verse
\itemize
\item \verse{%
  \let\@centercr\let\enditemize\endlist
  \list{\%}
  \leftmargin 2pc
  \itemindent -1.5em
  \listparindent \itemindent
  \rightmargin \leftmargin
  \advance \leftmargin 1.5em
  \%}
\enditemize
\let\endverse\endlist

\quotation
\itemize
\item \quotation{%
  \list{\%}
  \leftmargin 2pc
  \itemindent -1.5em
  \listparindent .5em
  \itemindent \listparindent
  \%}
\enditemize
\let\endquotation\endlist
There must be a more robust way of doing this. Should really do it by checking we are in a figure, but that would require some added bookkeeping.

\def\program{% 
(209) \ifx\@currsize\normalsize 
(2e) \ifdim\@size pt=10pt 
\small 
\else 
rm 
\fi 
\else 
\fi 
}
3.4 Theorems and proofs

\@begintheorem
\def\@begintheorem#1#2{\trivlist
\item[{\sc #1\enskip #2.}]{\it}
}
\@opargbegintheorem
\def\@opargbegintheorem#1#2#3{\trivlist
\item[{\hskip \parindent\hskip \labelsep\begingroup\savebox\@tempboxa{\sc #3}{\sc #1}\enskip #2.}%
\ifdim \wd\@tempboxa>\z@
\enskip\fi.\endgroup\it]
}
\if@qeded
\newif\if@qeded
\global\@qededfalse
\def\proof{\global\@qededfalse\@ifnextchar[{{\@xproof}{\@proof}}}
\def\endproof{\if@qeded\else\qed\fi\endtrivlist}
\if@qeded
\fi
\newif\if@qeded
\global\@qededfalse
proof
\def\proof{\global\@qededfalse\@ifnextchar[{{\@xproof}{\@proof}}}
\def\endproof{\if@qeded\else\qed\fi\endtrivlist}

The following two lines seem a little peculiar (repeated 5 times).
\hskip \parindent\hskip \labelsep
{\sc #1\enskip #2.}\it
\if@qeded
\fi.

Added parentheses around subtitle of lemma. – dmj, 4/19/96
\savebox\@tempboxa{\sc #3}{\sc #1}\
\enskip #2\
\ifdim \wd\@tempboxa>\z@
\enskip\fi.
\endgroup
\it

\fi
The following is inconsistent with the corresponding line in \opargbegintheorem.

The following is inconsistent with the corresponding line in \opargbegintheorem.
3.5 Tables of contents

\tableofcontents

\l@section

\l@section
3.6 Bibliographies and indexes

Which is the correct definition, this one or the one at the end of the file?
\itemsep \parsep
\usecounter{enumi}\
\def\newblock{\hskip .11em \@plus .33em \@minus .07em}\n\sloppy
\widowpenalty4500
\clubpenalty4500
\sfcode`\.=1000
\relax
}

\let\endthebibliography=\endlist

\if@restonecol
\h209
\newif\if@restonecol

theindex
\def\theindex{%
\@restonecoltrue
\if@twocolumn \@restonecolfalse \fi
\columnseprule \z@\n\columnsep 35\p@\n\twocolumn[\section*{Index}]
\@mkboth{INDEX}{INDEX}\n\thispagestyle{plain}\n\parindent\z@\n\parskip\z@ \@plus .3\p@\relax \n\let\item@idxitem
\@idxitem
\def\endtheindex{%
\if@restonecol
\oneline\n\else
\clearpage\n\fi
\}
\def\@idxitem{\par\hangindent 40\p@}
\def\subitem{\par\hangindent 40\p@ \hspace*{20\p@}}
\def\subsubitem{\par\hangindent 40\p@ \hspace*{30\p@}}
\def\indexspace{\par \vskip 10\p@ \@plus 5\p@ \@minus 3\p@\relax}
\def\footnoterule{\kern-3\p@\n\hrule \@width 47\p@ \%\@height .004\p@\n\kern 2.6\p@}
\def\footnoterule{\kern-3\p@\n\hrule \@width 47\p@ \%\@height .004\p@\n\kern 2.6\p@}
\footnoterule

This is supposed to be of 0 overall height.

Wait a minute. Height .004 points? Surely joking.
3.7 Floats and captions

\@makefntext
\long\def\@makefntext#1{% 
\parindent 1em 
\noindent ^{\@thefnmark}#1% 
}\c@topnumber
\topfraction
\c@bottomnumber
\bottomfraction
\c@totalnumber
\textfraction
\floatpagefraction
\c@dbltopnumber
\dbltopfraction
\dblfloatpagefraction

Changed float placement parameters in an attempt to enforce the ACM’s styles.
In particular, set bottomnumber and bottomfraction to 0 to inhibit floats from
appearing at the bottom of a page. There should be a minimum of four lines of
text on a page, so \textfraction should be set to

$$4 \times \left( \frac{\text{baselineskip}}{\text{textheight}} \right) = 4 \times \left( \frac{1\ \text{pc}}{47\ \text{pc}} \right) \approx .085106$$

We’ll round this up to .086 since it’s probably better to require a little more than
we need than to risk allowing less than we want. Finally, we set \topfraction
to .92 so that floats at the top of a page will be allowed to take up as
much as 1 – \textfraction of the page. [Note: need to check what value of
\floatpagefraction should be.] – dmj, 4/17/96

\setcounter{topnumber}{2}
\def\topfraction{.92}
\setcounter{bottomnumber}{0}
\def\bottomfraction{0}
\setcounter{totalnumber}{3}
\def\textfraction{.086}
\def\floatpagefraction{.6}
\setcounter{dbltopnumber}{2}
\def\dbltopfraction{.7}
\def\dblfloatpagefraction{.5}

\@makecaption

Changed colon to period in “long caption” case. [8/14/95–dmj]

We should think about consolidating and/or merging some of the numerous
caption macros. For example, \nocaption would be unnecessary if \caption
did something sensible when handed an empty argument. Also, much of
\@makecaption is identical to code found elsewhere, and should probably be
shared.

\def\nocaption{% 
\refstepcounter{@captype}
\par
\vskip 1pc
\}}

\nocaption

\def\nocaption{% 
\refstepcounter{@captype}
\par
\vskip 1pc
}
\begin{verbatim}
951 \centerline{\footnotesize \csname fnum@\@captype \endcsname}
952 }
\c@figure
\thefigure
\fps@figure
\ftype@figure
\ext@figure
\figurename
\fnum@figure

953 \newcounter{figure}
954 \def\thefigure{@arabic\c@figure}
955 \def\fps@figure{tp}
956 \def\ftype@figure{1}
957 \def\ext@figure{lof}
958 \def\figurename{Fig.}
959 \def\fnum@figure{\figurename~\thefigure}

960 \newenvironment{figure}{\let\@figfilename\@empty}{}

\begin{figure}

\begin{verbatim}
963 \newenvironment{figure}{}%
964 \renewenvironment{figure}[1][p]{%}
965 \let\normalsize\footnotesize
966 \normalsize
967 \@float{figure}[p]
968 }{\end@float
969 \global\setbox\@currbox\vbox to\textheight{%}
970 \vskip\@fptop
971 \unvbox\@currbox
972 \vskip\@fpbot
973 \par
974 \noindent \fnum@figure
975 \iftt \@figfilename\@empty
976 : {\tt \@figfilename}%
977 \global\let\@figfilename\@empty
978 \fi
979 }%
980 }
\else
981 \newenvironment{figure}{}%
982 \renewenvironment{figure}{}%
983 \let\normalsize\footnotesize
984 \normalsize
985 \@float{figure}
986 }{\end@float}
987 \fi
\end{verbatim}
\end{figure}
\end{verbatim}

What to do about figures with no numbers? Should we issue a warning? Should we check with ACM to make sure that a caption number is always required.

\begin{verbatim}
974 \iftt \fnum@figure
975 \iftt \@figfilename\@empty
976 : {\tt \@figfilename}%
977 \global\let\@figfilename\@empty
978 \fi
979 }%
980 }
\else
981 \newenvironment{figure}{}%
982 \renewenvironment{figure}{}%
983 \let\normalsize\footnotesize
984 \normalsize
985 \@float{figure}
986 }{\end@float}
987 \fi
\end{verbatim}

24
We don’t support two-column mode, so \texttt{figure*} is identical to \texttt{figure}.

\texttt{table*}  See documentation of \texttt{fps@figure}. – dmj, 4/17/96

\texttt{acmtable}
Ah ha! So captions have to go at end of figure, not before. Seems a little unfriendly. Actually, it’s necessary for \narrowfig, but doesn’t seem to be necessary for acmtable.

\@nfcap

\def\@nfcap{%
\par
\egroup
\refstepcounter{@captype}
\@dblarg{\@nfcapx[@captype]}
}

\@nfmakecap

\def\@nfmakecap #1#2{%
\setbox@tempboxa\hbox{#1.\quad #2}%
\ifdim \wd@tempboxa >\hsize
\sloppy #1.\quad #2 \par
\else
\@Oline%
\if@nfeven\else\hfil\fi
\fi
\box@tempboxa
\if@nfeven\hfil\fi
\if@nfeven\hfil\fi
}
\@nfcapx \long\def\@nfcapx#1[#2]#3{%  
\addcontentsline{\csname ext@#1\endcsname}{#1}{%  
\protect\numberline{\csname the#1\endcsname}{\ignorespaces #2}%  
}%  
\@seteven  
\setbox\@nfcapbox\vbox to \ht\@nfigbox{%  
\hsize \textwidth  
\advance\hsize -2pc  
\advance\hsize -\wd\@nfigbox  
@parboxrestore  
\vfil  
\@nfmakecap{\csname fnum@#1\endcsname}{\ignorespaces #3}%  
\par  
\vfil  
}%  
}\@nfnocap \def\@nfnocap{%  
\egroup  
\refstepcounter{\@captype}  
\@seteven  
\setbox\@nfcapbox\vbox to \ht\@nfigbox{%  
\hsize \textwidth  
\advance\hsize -2pc  
\advance\hsize -\wd\@nfigbox  
@parboxrestore  
\vfil  
\@@line{%  
\if@nfeven\else\hfil\fi  
\footnotesize \fnum@figure  
\if@nfeven\hfil\fi  
}%  
\vfil  
}%  
}\@seteven \@nfmsg \def\@seteven{%  
@nfeventrue  
@ifundefined{\r@@nf\thefigure}{}{\edef\@tmpnf{\csname r@@nf\thefigure\endcsname}}{\edef\@tmpnf{\expandafter\@cdr\@tmpnf\@nil}}{\ifodd\@tmpnf\relax\@nfevenfalse\fi}%  
\label{\@nf\thefigure}%  
\edef\@tmpnfx{\if@nfeven e\else o\fi}%  
%  
28
\def\@tmpnf{%
  \write\@unused{%
    \noexpand\ifodd \noexpand\c@page
    \noexpand\if \@tmpnfx e%
    \noexpand\nffmsg{\thefigure}
    \noexpand\fi
    \noexpand\else
    \noexpand\if \@tmpnfx o%
    \noexpand\nffmsg{\thefigure}\%
    \noexpand\fi
    \noexpand\fi
  \noexpand\fi
}%
)%
\}}
}\@tmpnf

\def\nffmsg#1{Bad narrowfig: Figure #1 on page \thepage}
\def\nffmsg#1{\PackageWarning{acmart}{Bad narrowfig: Figure #1 on page \thepage}}

\@narrowfig
\@nfigbox
\@nfcapbox
\if@nfeven
\newdimen\@narrowfig
\newbox\@nfigbox
\newbox\@nfcapbox
\newif\if@nfeven
\@nfeven

authinfo

authinfo Could be redone so that order isn’t important. But maybe not worth effort.
\newenvironment{authinfo}{% 
  \newcommand{\name}[1]{Name: \#1\newline } 
  \newcommand{\address}[1]{Address: \#1\newline } 
  \newcommand{\affiliation}[1]{Affiliation: \#1\newline } 
  \newcommand{\biography}[1]{Biography: \#1\newline} 
}{}

sponsor

sponsor should be redone as a real environment. But this has to await clarification from ACM about what they want the markup to be.
\newenvironment{sponsor}[2]{
  Sponsor: #1\strut\newline
  \parbox{3.4in}{#2}\%
}{}

\and
\maketitle
\def\and{\\ and\\}

%* Probably still needs more work
%*   %
\def\maketitle{%
  \newpage
  \thispagestyle{titlepage}%
  (209) \global\topnum\z@
  (+2e)
The space around the abstract doesn’t look quite right. Should investigate and fix. Maybe change \parskip in front matter to get uniform spacing (if that’s what’s desired).
Now we empty out a few temporary variables. However, note that we don’t clear
out \@author and \@title, since we need those later for \appendixhead.

\global\let\@categories\@empty
\global\let\@terms\@empty
\global\let\@keywords\@empty
}

\abstract
\@abstract
\def\abstract{%
\everypar{}
\global\setbox\@abstract\vbox\bgroup
\footnotesize
\trivlist\item[]\ignorespaces
}
\def\endabstract{%
\endtrivlist
\egroup
\ifx\maketitle\relax
h2e
\PackageWarning{acmart}{the abstract must be specified before the \MessageBreak
string\maketitle\space command}%
\box\@abstract
\fi
\endabstract
\endgroup
\let\maketitle\relax

\typeout{^^JPackage acmart Warning:
the abstract must be specified before the^^J%
\string\maketitle\space command^^J%}
\typeout{^^J}%
\terms
\let\terms\@empty

\keywords
\def\keywords{\gdef\@keywords}
\let\@keywords\@empty

\category
\def\category#1#2#3{\if\ifnextchar[\@category{#1}{#2}{#3}\fi\fi}
\let\@category\@empty

Should probably issue some sort of warning if the first or second arguments are empty.
\def\@category#1#2#3[#4]{\begingroup\edef\@tempa{\if\if\@categories\@empty\else\fi\fi}\let\protect\@unexpandable@protect\let\and\relax\xdef\@categories{\@categories\@tempa#1 [{\bf #2}]\if!#4!\if!#3!\else : #3\fi\else :\space #3 \kern\z@---\hskip\z@\fi\fi}}
\endgroup

bottomstuff
\def\bottomstuff{\global\@topnum\z@\global\@bottomroom \textheight\@float{figure}[b]\enlargethispage{-\baselineskip}\suppressfloats[t]\@float{figure}[!b]\footnotesize\parindent\z@}
\null
\vskip -\textfloatsep
\vskip 10\p@\hrule \@height .2\p@ \@width 30pc
%\vskip 2\p@

Changed this to 4pt to make up for lack of 10pt strut which used to be here in place of the 0pt strut. Could put 10pt strut back in, but then we’d get extra space if there is a blank line after the \begin{bottomstuff}.

\vskip 4\p@

Took this out since a 0pt rule isn’t very useful

%\rule{\z@}{\z@}\
\ignorespaces
\}

For \TeX2\textcopyright 2\textregistered, all we need at the end is \end@float. For \LaTeX 2.09, we also put in a strut to put in a little extra space at the bottom of the first page.

\begin{verbatim}
(2e)\let\endbottomstuff\end@float
(+209)
\def\endbottomstuff{\
par
\strut
\end@float
}
\end{verbatim}

\permission Removed final line (“Permissions may be requested from Publications Dept, ACM Inc., 1515 Broadway, New York, NY 10036 USA, fax +1 (212) 869-0481, or permissions@acm.org.”) at request of G. Criscione. – 5/12/96

\begin{verbatim}
\long\def\permission{\par

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\par
\}
\end{verbatim}

\acks Should this use small-caps instead?

\begin{verbatim}
\newenvironment{acks}{%\par
\@startsection{subsection}{2}{\z@}{-16\p@ \@plus -2\p@ \@minus -\p@}{2\p@}{\sf}*{\footnotesize ACKNOWLEDGMENTS}\
\}
\end{verbatim}

\received

\begin{verbatim}
\newenvironment{received}{%\par
\par
\footnotesize
\}
\end{verbatim}
\addvspace{18\p@ \@minus 4\p@} %
\parindent\z@
} %
\label{@lastpg} %
\par

\mark{}}}}

% \ps@myheadings
\def\ps@myheadings{%
\let\@mkboth\@gobbletwo
\def\@oddhead{%
% \null
\hfill\small\sf\rightmark
\hskip 19\p@ \%\large$\cdot$\%\hskip 17\p@
\thepage
\%}
\def\@oddfoot{\null\hfill\tiny\@runningfoot}
\def\@evenhead{%
\small\sf\thepage
\hskip 17\p@
\%\large$\cdot$\%\leftmark
\hfill
\%}
\def\@evenfoot{\tiny\@runningfoot \hfill\null}%
\let\partmark\@gobble
\let\sectionmark\@gobble
\let\subsectionmark\@gobble
\let\@runningfoot\@empty
\def\@firstfoot{%
\null\hfill\tiny\@runningfoot \hfill\null}%
\let\partmark\@gobble
\let\sectionmark\@gobble
\let\subsectionmark\@gobble
\def\pages{\pageref{@firstpg}--\pageref{@lastpg}}

% \runningfoot
\@runningfoot %
\def\runningfoot#1{\def\@runningfoot{#1}}
\firstfoot %
\let\@firstfoot\@empty
\pages
\def\firstfoot#1{\def\@firstfoot{#1}}
\let\@firstfoot\@empty
\let\@firstfoot\@empty
\def\pages{\pageref{@firstpg}--\pageref{@lastpg}}

% \ps@titlepage
\def\ps@titlepage{%
\let\@mkboth\@gobbletwo
\let\@oddhead\@empty
\def\@oddfoot{\null\hfill\tiny\@firstfoot}%
\let\@evenhead\@empty
\def\@evenfoot{\tiny\@firstfoot\hfill\null}%
\def\@evenfoot{\tiny\@firstfoot\hfill\null}%
}
\today
\def\today{\ifcase\month\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 \space \number\day, \number\year}

marray  marray is a variant of array where every entry is in \displaystyle rather than \textstyle
\def\marray{\arraycolsep 2.5\p@ \let\@acol\@arrayacol \let\@classz\@marrayclassz \let\@classiv\@marrayclassiv \let\\@arraycr \let\@halignto\@empty \@tabarray}
\let\endmarray\endarray

@marrayclassiv
@marrayclassz
\def\@marrayclassiv{\@addtopreamble{$\displaystyle \@nextchar$}}
\def\@marrayclassz{\ifcase\@lastchclass\@acolampacol\or\@ampacol\or\or\or\or\or\or\\@firstampfalse\@acol\fi\edef\@preamble{\@preamble\ifcase\@chnum\hfil$\relax\displaystyle\@sharp$\hfil\or$\relax\displaystyle\@sharp$\hfil\or\hfil$\relax\displaystyle\@sharp$\hfil\or$\relax\displaystyle\@sharp$\hfil\or\hfil$\relax\displaystyle\@sharp$\hfil\fi\@preamble\@preamble}}
4 Bibliography stuff

The following code was adapted from version 4 of chicago.sty by Glenn Paulley (gnpaulle@bluebox.uwaterloo.ca) for the new ACM bibliography style, which is similar (but not identical) to the “Chicago” style. It should be used with the acmtrans BibTeX style. The code was originally adapted by Andrew Appel and Rebecca Davies and later reworked by David M. Jones. Most of the prehistory of chicago.sty has been removed from the comments below, and the code has been modernized and reorganized somewhat in the interests of efficiency and (hopefully) maintainability.

The acmtrans BibTeX style has support for abbreviated author lists and for year-only citations. This is implemented by having the citations actually look like

\begin{verbatim}
\citeauthoryear{\{full-author-info\}}{\{abbrev-author-info\}}{\{year\}}
\end{verbatim}

These labels are processed by the following BibTeX commands.

\cite produces citations with full author list and year, e.g., “[Brown 1978; Jarke, Turner, Stohl, et al. 1985]”
\citeA produces citations with only the full author list, e.g., “[Brown; Jarke, Turner and Stohl]”
\shortcite produces citations with an abbreviated author list and year.
\shortciteA produces only the abbreviated author list.
\citeyear produces the year information only, within brackets.
\citeN produces citations with the full author list and year, but can be used as nouns in a sentence; parentheses appear only around the year, not around the author names, e.g., “Shneiderman [1978] states that…”. If given multiple citekeys, the items referred to should all have the same author; otherwise, an error is signaled.
\shortciteN is a variant of \citeN that uses an abbreviated author list.

Each of these macros also has a *-form, which suppresses the brackets that would normally surround the citation. (For \citeN and \shortciteN, the *-forms are identical to the normal forms.)

Abbreviated author lists use the “et al.” construct.
This LATEX style file must be used a modern (1995 or later) version of the \texttt{acmtrans} \LaTeX{} style.

\section{Citation macros}

Removed \texttt{\def\citeseppen{-1000}} from beginning of all cite macros, since that was left over from named.sty and not actually used anywhere, although it might not be a bad idea to incorporate something of that sort into our code. -- dmj 8/8/95

Each cite-like macro must do three things:

1. Define \texttt{@cite}, which will be used to format the in-text citation. Typically, this must decide whether to put brackets around the reference, and handles the optional argument to \texttt{\cite}.

2. Define \texttt{@citeauthoryear}, which determinines which part of the citation information is used in the citation.

3. Call the appropriate low-level citation command, which should be essentially identical to the standard \LaTeX{} \texttt{\cite} command. In this style, this is either \texttt{@citenormal}, which separates multiple citations by semi-colons, or \texttt{@citeyear}, which uses a comma to separate multiple references. The latter is used whenever the output consists of a series of years.

\texttt{\bibyear} See the description of \texttt{output.year.check} in \texttt{acmtrans.dtx} for an explanation of why this is necessary. The \texttt{\unskip}s and \texttt{\ignorespaces} are to eliminate any extra space that might creep in otherwise. (The first \texttt{\unskip} is the only one that should be necessary, but the others don’t hurt.)
\@normalcite \@normalcite is used for any citation commands that should surround their output with square brackets.

\def\@normalcite{% 
\def\@cite##1##2{[##1\if@tempswa , ##2\fi]}% 
}%

\@citeNB \@citeNB puts in no brackets at all.

\def\@citeNB{% 
\def\@cite##1##2{##1\if@tempswa , ##2\fi}% 
}%

\@citeRB \@citeRB just produces a right bracket; the left bracket will be supplied by \citeauthoryear. This is used by \citeN and \shortciteN, which only put brackets around the years, not around the authors.

\def\@citeRB{% 
\def\@cite##1##2{##1\if@tempswa , ##2\fi]%}% 
}%

\start@cite Should explain this.

\def\start@cite#1#2{% 
\edef\citeauthoryear##1##2##3{###1% 
\ifnum#2=\z@ \else\ ###2\fi 
}\ifnum#1=\thr@@ 
\let\@@cite\@citeyear 
\else 
\let\@@cite\@citenormal 
\fi 
@ifstar{\@citeNB\@@cite}{\@normalcite\@@cite} 
}%

\cite This is using the abbreviated author list, rather than the full author list. Is this correct? At any rate, it should be consistent with \citeNP.

\def\cite{\start@cite13}

\citeNP

\def\citeNP{\cite*}

\citeA

\def\citeA{\start@cite10}

\citeANP

\def\citeANP{\citeA*}

\shortcite

\def\shortcite{\start@cite23}

\shortciteNP

\def\shortciteNP{\shortcite*}
Should \texttt{\shortciteN} compare the full author lists or the abbreviated author lists (as it currently does)?
Although multiple citations within a single cite command should normally be separated by semi-colons, there are times when commas should be used instead. So, we modify the \@citex macro to take the delimiter as a parameter.
\bibindent  Indent second and subsequent lines of bibliographic entries. Stolen from open-
bib.sty:  \newblock \texttt{\textbackslash newblock} is set to \texttt{@\textendash empty}. (???)

\begin{verbatim}
1634 (+cls)
1635 \newdimen\bibindent
1636 \bibindent=1.5em

\refname
1637 (209)\def\refname{References}

\thebibliography Which is the correct definition of \texttt{\textbackslash thebibliography}, this one or the earlier one?
1638 \def\thebibliography#1{%
1639 \footnotesize
1640 \section*{
1641 \refname
1642 \@maketitle{}\uppercase{\refname}{}\uppercase{\refname}{\refname}{}
1643 }
1644 \list{[\arabic{enumi}]}
1645 \settowidth\labelwidth{[#1]}
1646 \leftmargin\labelwidth
1647 \advance\leftmargin\labelsep
1648 \advance\leftmargin\bibindent
1649 \itemindent \bibindent
1650 \listparindent \itemindent
1651 \parskip \z@%  \usecounter{enumi}
1652 \let
1653 \let\newblock\@empty
1654 \sloppy
1655 \sfcode`\.=1000\relax
1656 }
1657 (/cls)
\end{verbatim}

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