

Working Title

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Abstract

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*Something to do with the CDT

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- Your .tex file must compile in PDF \LaTeX — (you may not include .ps or .eps figure files.)
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- You may not alter the line spacing of text.
- Your title must follow Title Case capitalization rules (not sentence case).
- Your .tex file must include completed metadata to pass-through to the PDF (see PDFINFO below)
- L^AT_EX documents must use the Times or Nimbus font package (you may not use Computer Modern for the text of your paper).
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- Your source must not require use of fonts for non-Roman alphabets within the text itself. If your paper includes symbols in other languages (such as, but not limited to, Arabic, Chinese, Hebrew, Japanese, Thai, Russian and other Cyrillic languages), you must restrict their use to bit-mapped figures. Fonts that require non-English language support (CID and Identity-H) must be converted to outlines or 300 dpi bitmap or removed from the document (even if they are in a graphics file embedded in the document).
- Two-column format in AAAI style is required for all papers.
- The paper size for final submission must be US letter without exception.
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- The number of pages and the file size must be as specified for your event.
- No document may be password protected.
- Neither the PDFs nor the source may contain any embedded links or bookmarks (no hyperref or navigator packages).
- Your source and PDF must not have any page numbers, footers, or headers (no pagestyle commands).
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- Your L^AT_EX source file (excluding references) must consist of a **single** file (use of the “input” command is not allowed).
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You must submit the following items to ensure that your paper is published:

- A fully-compliant PDF file that includes PDF metadata.
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- The bibliography (.bib) file(s).
- Your source must compile on our system, which includes only standard L^AT_EX 2019 TeXLive support files.
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Your L^AT_EX source will be reviewed and recompiled on our system (if it does not compile, you will be required to resubmit, which will incur fees). **Do not submit your source in multiple text files.** Your single L^AT_EX source file must include all your text, your bibliography (formatted using aaai.bst), and any custom macros.

Your files should work without any supporting files (other than the program itself) on any computer with a standard L^AT_EX distribution.

Do not send files that are not actually used in the paper. We don’t want you to send us any files not needed for compiling your paper, including, for example, this instructions file, unused graphics files, style files, additional material sent for the purpose of the paper review, and so forth.

Do not send supporting files that are not actually used in the paper. We don’t want you to send us any files not needed for compiling your paper, including, for example, this instructions file, unused graphics files, style files, additional material sent for the purpose of the paper review, and so forth.

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In the L^AT_EX source for your paper, you **must** place the following lines as shown in the example in this subsection. This command set-up is for three authors. Add or subtract author and address lines as necessary, and uncomment the portions

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Leave the setcounter for section number depth commented out and set at 0 unless you want to add section numbers to your paper. If you do add section numbers, you must uncomment this line and change the number to 1 (for section numbers), or 2 (for section and subsection numbers). The style file will not work properly with numbering of subsections, so do not use a number higher than 2.

If (and only if) your author title information will not fit within the specified height allowed, put \setlength\titlebox2.5in in your preamble. Increase the height until the height error disappears from your log. You may not use the \setlength command elsewhere in your paper, and it may not be used to reduce the height of the author-title box.

The Following Must Appear in Your Preamble

```
\documentclass[letterpaper]{article}
\usepackage{aaai20}
\usepackage{times}
\usepackage{helvet}
\usepackage{courier}
\usepackage{hyphens}{url}
\usepackage{graphicx}
\urlstyle{rm}
\def\UrlFont{\rm}
\usepackage{graphicx}
\frenchspacing
\setlength{\pdfpagewidth}{8.5in}
\setlength{\pdfpageheight}{11in}
% Add additional packages here, but check
% the list of disallowed packages
% (including, but not limited to
% authblk, caption, CJK, float, fullpage, geometry,
% hyperref, layout, nameref, natbib, savetrees,
% setspace, titlesec, tocbibind, ulem)
% and illegal commands provided in the
% common formatting errors document
% included in the Author Kit before doing so.
%
% PDFINFO
% You are required to complete the following
% for pass-through to the PDF.
% No LaTeX commands of any kind may be
% entered. The parentheses and spaces
% are an integral part of the
% pdfinfo script and must not be removed.
%
\pdfinfo{
/Title (Type Your Paper Title Here in Mixed Case)
/Author (John Doe, Jane Doe)
/Keywords (Input your keywords in this optional area)
}
%
% Section Numbers
% Uncomment if you want to use section numbers
% and change the 0 to a 1 or 2
% \setcounter{secnumdepth}{0}
```

```
% Title and Author Information Must Immediately Follow
% the pdfinfo within the preamble
%
\title{Title}\\
\author{\{Author 1 \ and Author 2\\
Address line\\
Address line\\
\ And\\
Author 3\\
Address line\\
Address line
}\\}
```

Preparing Your Paper

After the preamble above, you should prepare your paper as follows:

```
%
\begin{document}
\maketitle
\begin{abstract}
%...
\end{abstract}
```

The Following Must Conclude Your Document

```
% References and End of Paper
% These lines must be placed at the end of your paper
\bibliography{Bibliography-File}
\bibliographystyle{aaai}
\end{document}
```

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```
\begin{document}\\
\maketitle\\
...\\
\bibliography{Bibliography-File}\\
\bibliographystyle{aaai}\\
\end{document}\\
```

Commands and Packages That May Not Be Used

There are a number of packages, commands, scripts, and macros that are incompatible with aaai20.sty. The common ones are listed in tables 1 and 2. Generally, if a command, package, script, or macro alters floats, margins, fonts, sizing, linespacing, or the presentation of the references and

Table 1: Commands that must not be used

<code>\abovecaption</code>	<code>\abovedisplay</code>	<code>\addevensidemargin</code>	<code>\addsidemargin</code>
<code>\addtolength</code>	<code>\baselinestretch</code>	<code>\belowcaption</code>	<code>\belowdisplay</code>
<code>\break</code>	<code>\clearpage</code>	<code>\clip</code>	<code>\columnsep</code>
<code>\float</code>	<code>\input</code>	<code>\input</code>	<code>\linespread</code>
<code>\newpage</code>	<code>\pagebreak</code>	<code>\renewcommand</code>	<code>\setlength</code>
<code>\text height</code>	<code>\tiny</code>	<code>\top margin</code>	<code>\trim</code>
<code>\vskip{-</code>	<code>\vspace{-</code>		

Table 2: LaTeX style packages that must not be used.

<code>authblk</code>	<code>babel</code>	<code>caption</code>	<code>cjk</code>
<code>dvips</code>	<code>epsf</code>	<code>epsfig</code>	<code>euler</code>
<code>float</code>	<code>fullpage</code>	<code>geometry</code>	<code>graphics</code>
<code>hyperref</code>	<code>layout</code>	<code>linespread</code>	<code>lmodern</code>
<code>maltepaper</code>	<code>natbib</code>	<code>navigator</code>	<code>pdfcomment</code>
<code>pgfplots</code>	<code>psfig</code>	<code>pstricks</code>	<code>t1enc</code>
<code>titlesec</code>	<code>tocbind</code>	<code>ulem</code>	

citations, it is unacceptable. Note that negative `vskip` and `vspace` may not be used except in certain rare occurrences, and may never be used around tables, figures, captions, sections, subsections, subsections, or references.

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For your final camera ready copy, you must not use any page break commands. References must flow directly after the text without breaks. Note that some conferences require references to be on a separate page during the review process. AAAI Press, however, does not require this condition for the final paper.

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If your paper is too long, turn on `\frenchspacing`, which will reduce the space after periods. Next, shrink the size of your graphics. Use `\centering` instead of `\begin{center}` in your figure environment. For mathematical environments, you may reduce fontsize **but not below 6.5 point**. You may also alter the size of your bibliography and tables by inserting `\fontsize{9.5pt}{10.5pt}` `\selectfont` right before the bibliography (the minimum size is `\fontsize{9.0pt}{10.0pt}`). You may not use any commands that further reduce point size. Be careful when scaling tables and figures. Tables that do not fit in a single column, even after the font size reduction to 9 point, must be placed across double columns. If your table won't fit within the margins even in double columns, you must split it. We will not accept single (or double) column tables that have been scaled to anything below 9 point.

Commands that alter page layout are forbidden. These include `\columnsep`, `\topmargin`, `\topskip`, `\textheight`, `\textwidth`, `\oddsidemargin`, and `\evensidemargin` (this list is not exhaustive). If you alter page layout, you will be required to pay the page fee *plus* a reformatting fee. Other commands that are questionable and may cause your paper to be rejected include `\parindent`, and `\parskip`. Commands that alter the space between sections are forbidden. The title sec package is not allowed. Regardless of the above, if your paper is obviously “squeezed” it is not going to be accepted. Options for reducing the length of a paper include reducing the size of your graphics, cutting text, or paying the extra page charge (if it is offered).

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If you normally create your figures using `pgfplots`, please create the figures first, and then import them as pdfs with proper bounding boxes, as the bounding and trim boxes created by `pgfplots` are fragile, and not valid.

When you include your figures, you must crop them **outside** of \LaTeX . The command `\includegraphics*[clip=true, viewport 0 0 10 10]...` might result in a PDF that looks great, but the image is **not really cropped**. The full image can reappear (and obscure whatever it is overlapping) when page numbers are applied or color space is standardized. Figures 1, and 2 display some unwanted results that often occur.

Figure 1: Using the trim and clip commands produces fragile layers that can result in disasters (like this one from an actual paper) when the color space is corrected or the PDF combined with others for the final proceedings. Crop your figures properly in a graphics program – not in LaTeX

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```
\author{Author 1, ... Author n\\
Address line \\ ... \\ Address line}
```

If the names do not fit well on one line use:

```
\author{Author 1} ... \\
{\bf \Large Author ... Author}\\
Address line \\ ... \\ Address line
}
```

For two (or three) authors from different institutions, use `\And`:

```
\author{Author 1\\ Address line \\ ... \\ Address line
\And ... \And Author n\\
Address line\\ ... \\ Address line}
```

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If the title and author information does not fit in the area allocated, place `\setlength\titlebox{height}` after the `\documentclass` line where `{height}` is 2.5in or greater. (This one of the only allowable uses of the `setlength` command. Check with AAI Press before using it elsewhere.)

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If your paper has a large number of authors from different institutions, you may use the following alternative method for displaying the author information.

```
\author{AuthorOne,\textsuperscript{\rm 1}
AuthorTwo,\textsuperscript{\rm 2}
AuthorThree,\textsuperscript{\rm 3}
\\bf \Large AuthorFour,\textsuperscript{\rm 4}
AuthorFive, \textsuperscript{\rm 5}\\
\textsuperscript{\rm 1}AffiliationOne,
```

Figure 2: Adjusting the bounding box instead of actually removing the unwanted data resulted multiple layers in this paper. It also needlessly increased the PDF size. In this case, the size of the unwanted layer doubled the paper’s size, and produced the following surprising results in final production. Crop your figures properly in a graphics program. Don’t just alter the bounding box.

```
\textsuperscript{\rm 2}AffiliationTwo,
\textsuperscript{\rm 3}AffiliationThree\\
\textsuperscript{\rm 4}AffiliationFour,
\textsuperscript{\rm 5}AffiliationFive
\{email, email\}@affiliation.com,
email@affiliation.com,
email@affiliation.com,
email@affiliation.com
```

Note that you should break the author list before it extends into the right column margin. Put a line break, followed by `\bf\Large` to put the second line of authors in the same font and size as the first line (you may not make authors names smaller to save space.) Affiliations can be broken with a simple line break (`\`).

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```
\title{Very Important Results in AI}\thanks{This work is supported by everybody.}}
```

Multiple `\thanks` commands can be given. Each will result in a separate footnote indication in the author or title with the corresponding text at the bottom of the first column of the document. Note that the `\thanks` command is fragile. You will need to use `\protect`.

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Do not **ever** print any page numbers on your paper. The use of `\pagestyle` is forbidden.

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Citations

Citations within the text should include the author’s last name and year, for example (Newell 1980). Append lower-case letters to the year in cases of ambiguity. Multiple authors should be treated as follows: (Feigenbaum and Englemore 1988) or (Ford, Hayes, and Glymour 1992). In the case of four or more authors, list only the first author, followed by *et al.* (Ford *et al.* 1997).

Extracts

Long quotations and extracts should be indented ten points from the left and right margins.

This is an example of an extract or quotation. Note the indent on both sides. Quotation marks are not necessary if you offset the text in a block like this, and properly identify and cite the quotation in the text.

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Avoid footnotes as much as possible; they interrupt the reading of the text. When essential, they should be consecutively numbered throughout with superscript Arabic numbers. Footnotes should appear at the bottom of the page, separated from the text by a blank line space and a thin, half-point rule.

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When necessary, headings should be used to separate major sections of your paper. Remember, you are writing a short paper, not a lengthy book! An overabundance of headings will tend to make your paper look more like an outline than a paper. The `aaai.sty` package will create headings for you. Do not alter their size nor their spacing above or below.

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Section Headings. Sections should be arranged and headed as follows:

Acknowledgments. The acknowledgments section, if included, appears after the main body of text and is headed “Acknowledgments.” This section includes acknowledgments of help from associates and colleagues, credits to sponsoring agencies, financial support, and permission to

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Appendices. Any appendices follow the acknowledgments, if included, or after the main body of text if no acknowledgments appear.

References The references section should be labeled “References” and should appear at the very end of the paper (don’t end the paper with references, and then put a figure by itself on the last page). A sample list of references is given later on in these instructions. Please use a consistent format for references. Poorly prepared or sloppy references reflect badly on the quality of your paper and your research. Please prepare complete and accurate citations.

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Figures, drawings, tables, and photographs should be placed throughout the paper near the place where they are first discussed. Do not group them together at the end of the paper. If placed at the top or bottom of the paper, illustrations may run across both columns. Figures must not invade the top, bottom, or side margin areas. Figures must be inserted using the `\usepackage{graphicx}`. Number figures sequentially, for example, figure 1, and so on.

The illustration number and caption should appear under the illustration. Labels, and other text with the actual illustration must be at least nine-point type.

If your paper includes illustrations that are not compatible with PDF_{TEX} (such as .eps or .ps documents), you will need to convert them. The `epstopdf` package will usually work for eps files. You will need to convert your ps files to PDF however.

Low-Resolution Bitmaps. You may not use low-resolution (such as 72 dpi) screen-dumps and GIF files—these files contain so few pixels that they are always blurry, and illegible when printed. If they are color, they will become an indecipherable mess when converted to black and white. This is always the case with gif files, which should never be used. The resolution of screen dumps can be increased by reducing the print size of the original file while retaining the same number of pixels. You can also enlarge files by manipulating them in software such as PhotoShop. Your figures should be 300 dpi when incorporated into your document.

L_AT_EX Overflow. L_AT_EX users please beware: L_AT_EX will sometimes put portions of the figure or table or an equation in the margin. If this happens, you need to scale the figure or table down, or reformat the equation. **Check your log file!** You must fix any overflow into the margin (that means no overfull boxes in L_AT_EX). **Nothing is permitted to intrude into the margin or gutter.**

The most efficient and trouble-free way to fix overfull boxes in graphics is with the following command:

```
\resizebox{.95\columnwidth}{!}{ }
```

Be certain, however, that your figures remain legible without magnification.

Using Color. Use of color is restricted to figures only. It must be WACG 2.0 compliant. (That is, the contrast ratio must be greater than 4.5:1 no matter the font size.) It must be CMYK, NOT RGB. It may never be used for any portion of the text of your paper. The archival version of your paper will be printed in black and white and grayscale. The web version must be readable by persons with disabilities. Consequently, because conversion to grayscale can cause undesirable effects (red changes to black, yellow can disappear, and so forth), we strongly suggest you avoid placing color figures in your document. If you do include color figures, you must (1) use the CMYK (not RGB) colorspace and (2) be mindful of readers who may happen to have trouble distinguishing colors. Your paper must be decipherable without using color for distinction.

Drawings. We suggest you use computer drawing software (such as Adobe Illustrator or, (if unavoidable), the drawing tools in Microsoft Word) to create your illustrations. Do not use Microsoft Publisher. These illustrations will look best if all line widths are uniform (half- to two-point in size), and you do not create labels over shaded areas. Shading should be 133 lines per inch if possible. Use Times Roman or Helvetica for all figure call-outs. **Do not use hairline width lines** — be sure that the stroke width of all lines is at least .5 pt. Zero point lines will print on a laser printer, but will completely disappear on the high-resolution devices used by our printers.

Photographs and Images. Photographs and other images should be in grayscale (color photographs will not reproduce well; for example, red tones will reproduce as black, yellow may turn to white, and so forth) and set to a minimum of 300 dpi. Do not prescreen images.

Resizing Graphics. Resize your graphics **before** you include them with LaTeX. You may **not** use trim or clip options as part of your `\includegraphics` command. Resize the media box of your PDF using a graphics program instead.

Fonts in Your Illustrations You must embed all fonts in your graphics before including them in your LaTeX document.

References

The AAAI style includes a set of definitions for use in formatting references with Bib_{TEX}. These definitions make the bibliography style fairly close to the one specified below. To use these definitions, you also need the Bib_{TEX} style file “`aaai.bst`,” available in the AAAI Author Kit on the AAAI web site. Then, at the end of your paper but before `\enddocument`, you need to put the following lines:

```
\bibliographystyle{aaai} \bibliography{bibfile1,bibfile2,...}
```

Please note that you are required to use `\bibliographystyle{aaai}` for your references. You may not use named, plain, apalike, acm, ieeetr, siam, chicago,

or any other style. Use of natbib is also not acceptable. (In addition to natbib, the aai20.sty file is also incompatible with the hyperref and navigator packages. If you use either, your references will be garbled and your paper will be returned to you.) If you used natbib commands, an imprecise workaround is available (although it does not always work). You may put the following in your preamble (after removing \usepackage{natbib})

```
\newcommand{\citel}[1]{\citeauthor{#1} \shortcite{#1}}
\newcommand{\citep}{\cite}
\newcommand{\citealp}[1]{\citeauthor{#1} \citeyear{#1}}
```

References may be the same size as surrounding text. However, in this section (only), you may reduce the size to \small if your paper exceeds the allowable number of pages. Making it any smaller than 9 point with 10 point linespacing, however, is not allowed. A more precise and exact method of reducing the size of your references minimally is by means of the following command:

```
\fontsize{9.8pt}{10.8pt} \selectfont
```

You must reduce the size equally for both font size and line spacing, and may not reduce the size beyond {9.0pt}{10.0pt}.

The list of files in the \bibliography command should be the names of your BibTeX source files (that is, the .bib files referenced in your paper).

The following commands are available for your use in citing references:

\cite: Cites the given reference(s) with a full citation. This appears as “(Author Year)” for one reference, or “(Author Year; Author Year)” for multiple references.

\shortcite: Cites the given reference(s) with just the year. This appears as “(Year)” for one reference, or “(Year; Year)” for multiple references.

\citeauthor: Cites the given reference(s) with just the author name(s) and no parentheses.

\citeyear: Cites the given reference(s) with just the date(s) and no parentheses.

Formatted bibliographies should look like the following examples.

Book with Multiple Authors

Engelmore, R., and Morgan, A. eds. 1986. *Blackboard Systems*. Reading, Mass.: Addison-Wesley.

Journal Article

Robinson, A. L. 1980a. New Ways to Make Microcircuits Smaller. *Science* 208: 1019–1026.

Magazine Article

Hasling, D. W.; Clancey, W. J.; and Rennels, G. R. 1983. Strategic Explanations in Consultation. *The International Journal of Man-Machine Studies* 20(1): 3–19.

Proceedings Paper Published by a Society

Clancey, W. J. 1983. Communication, Simulation, and Intelligent Agents: Implications of Personal Intelligent Machines for Medical Education. In *Proceedings of the Eighth International Joint Conference on Artificial Intelligence*, 556–560. Menlo Park, Calif.: International Joint Conferences on Artificial Intelligence, Inc.

Proceedings Paper Published by a Press or Publisher

Clancey, W. J. 1984. Classification Problem Solving. In *Proceedings of the Fourth National Conference on Artificial Intelligence*, 49–54. Menlo Park, Calif.: AAAI Press.

University Technical Report

Rice, J. 1986. Polygon: A System for Parallel Problem Solving, Technical Report, KSL-86-19, Dept. of Computer Science, Stanford Univ.

Dissertation or Thesis

Clancey, W. J. 1979. Transfer of Rule-Based Expertise through a Tutorial Dialogue. Ph.D. diss., Dept. of Computer Science, Stanford Univ., Stanford, Calif.

Forthcoming Publication

Clancey, W. J. 2021. The Engineering of Qualitative Models. Forthcoming.

For the most up to date version of the AAAI reference style, please consult the *AI Magazine* Author Guidelines at <https://aaai.org/ojs/index.php/aimagazine/about/submissions#authorGuidelines>

Proofreading Your PDF

Please check all the pages of your PDF file. The most commonly forgotten element is the acknowledgements — especially the correct grant number. Authors also commonly forget to add the metadata to the source, use the wrong reference style file, or don’t follow the capitalization rules or comma placement for their author-title information properly. A final common problem is text (especially equations) that runs into the margin. You will need to fix these common errors before submitting your file.

Improperly Formatted Files

In the past, AAAI has corrected improperly formatted files submitted by the authors. Unfortunately, this has become an increasingly burdensome expense that we can no longer absorb (we are charged double for papers that require reformatting). Consequently, if your file is improperly formatted, it will probably be returned to you by the outside Production agency. If that happens, you will be required to fix your file and pay a resubmission fee.

L^AT_EX 209 Warning

If you use L^AT_EX 209 your paper will be returned to you unpublished. Convert your paper to L^AT_EX 2_ε.

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Instructions on paper submittal will be provided to you in your acceptance letter.

Inquiries

If you have any questions about the preparation or submission of your paper as instructed in this document, please contact AAAI Press at the address given below. If you have technical questions about implementation of the `aaai` style file, please contact an expert at your site. We do not provide technical support for \LaTeX or any other software package. To avoid problems, please keep your paper simple, and do not incorporate complicated macros and style files.

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Palo Alto, California 94303

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E-mail: See the submission instructions for your particular conference or event.

Additional Resources

\LaTeX is a difficult program to master. If you've used that software, and this document didn't help or some items were not explained clearly, we recommend you read Michael Shell's excellent document (testflow doc.txt V1.0a 2002/08/13) about obtaining correct PS/PDF output on \LaTeX systems. (It was written for another purpose, but it has general application as well). It is available at www.ctan.org in the `tex-archive`.

Acknowledgments

AAAI is especially grateful to Peter Patel Schneider for his work in implementing the `aaai.sty` file, liberally using the ideas of other style hackers, including Barbara Beeton. We also acknowledge with thanks the work of George Ferguson for his guide to using the style and BibTeX files — which has been incorporated into this document — and Hans Guesgen, who provided several timely modifications, as well as the many others who have, from time to time, sent in suggestions on improvements to the AAAI style.

The preparation of the \LaTeX and BibTeX files that implement these instructions was supported by Schlumberger Palo Alto Research, AT&T Bell Laboratories, Morgan Kaufmann Publishers, The Live Oak Press, LLC, and AAAI Press. Bibliography style changes were added by Sunil Isar. `\pubnote` was added by J. Scott Penberthy. George Ferguson added support for printing the AAAI copyright slug. Additional changes to `aaai.sty` and `aaai.bst` have been made by the AAAI staff.

Thank you for reading these instructions carefully. We look forward to receiving your electronic files!