

Quick start for LaTeXing with IEEEtran.cls for IEEE Computer Society Conferences

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Abstract—Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

I. INTRODUCTION

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus

viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus enim. Vestibulum pellentesque felis eu massa. TODO!

The remainder of the paper starts with a presentation of related work (Section II). It is followed by a presentation of hints on L^AT_EX (Section III). Finally, a conclusion is drawn and outlook on future work is made (Section IV).

II. RELATED WORK

Winery [1] is a graphical modeling tool. The whole idea of TOSCA is explained by Binz et al. [2].

III. L^AT_EX HINTS

This section contains hints on writing L^AT_EX. It focuses on minimal examples, which can be directly adapted to the content

A. Handling of paragraphs

One sentence per line. This rule is important for the usage of version control systems. A new line is generated with a blank line. As you would do in Word: New paragraphs are generated by pressing enter. In L^AT_EX, this does not lead to a new paragraph as L^AT_EX joins subsequent lines. In case you want a new paragraph, just press enter twice! This leads to an empty line. In word, there is the functionality to press shift and enter. This leads to a hard line break. The text starts at the beginning of a new line. In L^AT_EX, you can do that by using two backslashes (\\). This is rarely used.

Please do *not* use two backslashes for new paragraphs. For instance, this sentence belongs to the same paragraph, whereas the last one started a new one. A long motivation for that is provided at <http://loopspace.mathforge.org/HowDidIDoThat/TeX/VCS/#section.3>.

Corresponding L^AT_EX code of ./paper-minted.tex

```
511 One sentence per line.
512 This rule is important for the usage of version
    ↪ control systems.
513 A new line is generated with a blank line.
514 As you would do in Word:
515 New paragraphs are generated by pressing enter.
516 In LaTeX, this does not lead to a new paragraph
    ↪ as LaTeX joins subsequent lines.
517 In case you want a new paragraph, just press
    ↪ enter twice!
518 This leads to an empty line.
519 In word, there is the functionality to press
    ↪ shift and enter.
520 This leads to a hard line break.
521 The text starts at the beginning of a new line.
522 In LaTeX, you can do that by using two
    ↪ backslashes (\textbackslash\textbackslash).
523 \\
524 This is rarely used.
525
526 Please do \textit{not} use two backslashes for
    ↪ new paragraphs.
527 For instance, this sentence belongs to the same
    ↪ paragraph, whereas the last one started a
    ↪ new one.
528 A long motivation for that is provided at
    ↪ \url{http://loopspace.mathforge.org/}
    ↪ HowDidIDoThat/TeX/VCS/#section.3}.
```

B. Notes separated from the text

The package mindflow enables writing down notes and annotations in a way so that they are separated from the main text.

This is a small note.

Corresponding L^AT_EX code of ./paper-minted.tex

```
536 \begin{mindflow}
537 This is a small note.
538 \end{mindflow}
```

C. Handling TODOs

Markierter Text.

Corresponding L^AT_EX code of ./paper-minted.tex

```
544 \textmarker{Markierter Text.}
```

Bei `\textmarker` wird nur die Textfarbe geändert, da dies auch bei einigen Worten gut funktioniert.

Markierter Text.

Corresponding L^AT_EX code of ./paper-minted.tex

```
550 \textcomment{Markierter Text.}{Kommentar dazu.}
```

Manuelle Markierung für Text, der seit der letzten Version geändert wurde.

Corresponding L^AT_EX code of ./paper-minted.tex

```
554 \modified{Manuelle Markierung für Text, der
    ↪ seit der letzten Version geändert wurde.}
```

Das ist ein Text. Geänderter Text.

Corresponding L^AT_EX code of ./paper-minted.tex

```
558 Das ist ein Text.
559 \change{FL1: Text angepasst}{Geänderter Text}.
```

Hier nur ein Kommentar.

Corresponding L^AT_EX code of ./paper-minted.tex

```
563 Hier nur ein Kommentar\sidecomment{Kommentar}.
```

TODO!

Corresponding L^AT_EX code of ./paper-minted.tex

```
567 \todo{Hier muss noch kräftig Text produziert
    ↪ werden}
```

D. Hyphenation

L^AT_EX automatically hyphenates words. When using microtype, there should be fewer hyphenations than in other settings. It might be necessary to tweak the hyphenations nevertheless. Here are some hints:

In case you write “application-specific”, then the word will only be hyphenated at the dash. You can also write `applica\allowbreak{tion-specific}` (result: application-specific), but this is much more effort.

You can now write words containing hyphens which are hyphenated at other places in the word. For instance, `application"=specific` gets application"=specific. This is enabled by an additional configuration of the babel package.

Corresponding L^AT_EX code of ./paper-minted.tex

```
578 In case you write
    ↪ \enquote{application-specific}, then the
    ↪ word will only be hyphenated at the dash.
579 You can also write
    ↪ \verbiapplica\allowbreak{tion-specific1
    ↪ (result:
    ↪ applica\allowbreak{tion-specific), but
    ↪ this is much more effort.
580
581 You can now write words containing hyphens
    ↪ which are hyphenated at other places in the
    ↪ word.
582 For instance, \verbiapplication="specific1 gets
    ↪ application="specific.
583 This is enabled by an additional configuration
    ↪ of the babel package.
```

E. Typesetting Units

Numbers can be written plain text (such as 100), by using the siunitx package as follows: $100 \frac{\text{km}}{\text{h}}$, or by using plain L^AT_EX (and math mode): $100 \frac{\text{km}}{\text{h}}$.

Corresponding L^AT_EX code of ./paper-minted.tex

```
589 Numbers can be written plain text (such as
    ↪ 100), by using the \href{https://ctan.org/|
    ↪ pkg/siunitx}{siunitx} package as follows:
590 \SI{100}{\km\per\hour},
591 or by using plain \LaTeX{} (and math mode):
592 $100 \frac{\mathit{km}}{h}$.
```

5% of 10 kg

Corresponding L^AT_EX code of ./paper-minted.tex

```
596 \SI{5}{\percent} of \SI{10}{kg}
```

Numbers are automatically grouped: 123 456.

Corresponding L^AT_EX code of ./paper-minted.tex

```
600 Numbers are automatically grouped:
    ↪ \num{123456}.
```

F. Surrounding Text by Quotes

Please use the “enquote command” to quote something. Quoting with “quote” or “quote” also works.

Corresponding L^AT_EX code of ./paper-minted.tex

```
606 Please use the \enquote{enquote command} to
    ↪ quote something.
607 Quoting with "quote" or `quote' also works.
608
```

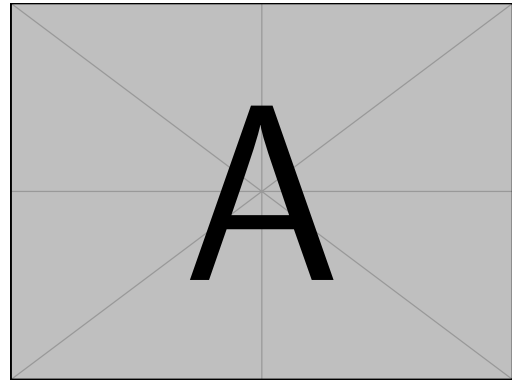


Figure 1: Example figure for cref demo

Heading1	Heading2
One	Two
Thee	Four

Figure 2: Example table for cref demo

G. Cleveref examples

Cleveref demonstration: Cref at beginning of sentence, cref in all other cases.

Figure 1 shows a simple fact, although Figure 1 could also show something else.

Figure 2 shows a simple fact, although Figure 2 could also show something else.

Section III-G shows a simple fact, although Section III-G could also show something else.

Corresponding L^AT_EX code of ./paper-minted.tex

```
638 \Cref{fig:ex:cref} shows a simple fact,
    ↪ although \cref{fig:ex:cref} could also show
    ↪ something else.
639
640 \Cref{tab:ex:cref} shows a simple fact,
    ↪ although \cref{tab:ex:cref} could also show
    ↪ something else.
641
642 \Cref{sec:ex:cref} shows a simple fact,
    ↪ although \cref{sec:ex:cref} could also show
    ↪ something else.
```

H. Figures

Figure 3 shows something interesting.

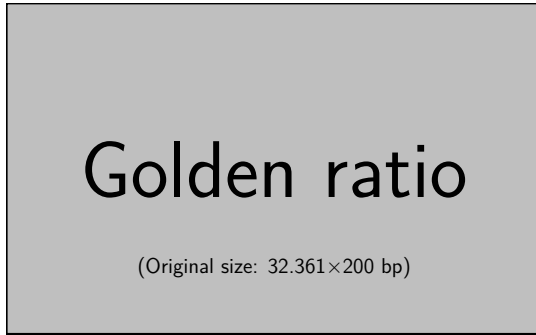


Figure 3: Simple Figure. Based on Scharrer [3].

Corresponding L^AT_EX code of ./paper-minted.tex

```
648 \Cref{fig:label} shows something interesting.
649
650 \begin{figure}
651   \centering
652   \includegraphics[width=.8\linewidth]{
653     ↪ example-image-golden}
654   \caption[Simple Figure]{
655     Simple Figure.
656     Based on \citet{mwe}.
657   }
658   \label{fig:label}
659 \end{figure}
```

One can span a figure across multiple columns by using `\begin{figure*}`. See Figure 4 as an example.

Corresponding L^AT_EX code of ./paper-minted.tex

```
665 \begin{figure*}
666   \centering
667   % note that \textwidth is used instead of
668   ↪ \linewidth
669   % This ensures that the graphics width is 60%
670   ↪ of the "page" (text block), and not just
671   ↪ 60% of the current text column
672   % See https://tex.stackexchange.com/a/17085/
673   ↪ 9075 for details
674   \includegraphics[width=.6\textwidth]{
675     ↪ example-image-16x9}
676   \caption{16x9 Figure}
677   \label{fig:16x9}
678 \end{figure*}
```

I. Sub Figures

An example of two sub figures is shown in Figure 5.

Corresponding L^AT_EX code of ./paper-minted.tex

```
682 \begin{figure*}[!b]
683   \centering
684   \subfloat[Case I]{\includegraphics[width=.4]
685     ↪ \linewidth}{example-image-a}%
686   \label{fig:first_case}}
687   \hfil
688   \subfloat[Case II]{\includegraphics[width=.4]
689     ↪ \linewidth}{example-image-b}%
690   \label{fig:second_case}}
691   \caption[Example figure with two sub
692     ↪ figures.]
693   \label{fig:two_sub_figures}
694 \end{figure*}
```

Note that often IEEE papers with subfigures do not employ subfigure captions (using the optional argument to `\subfloat[]`), but instead will reference/describe all of them (a), (b), etc., within the main caption. Be aware that for `subfig.sty` to generate the (a), (b), etc., subfigure labels, the optional argument to `\subfloat` must be present. If a subcaption is not desired, just leave its contents blank, e.g., `\subfloat[]`. An example is shown in Figure 6.

Corresponding L^AT_EX code of ./paper-minted.tex

```
704 \begin{figure*}[!b]
705   \centering
706   \subfloat[]{\includegraphics[width=.4]
707     ↪ \linewidth}{example-image-a}%
708   \label{fig:first_case_ieee}}
709   \hfil
710   \subfloat[]{\includegraphics[width=.4]
711     ↪ \linewidth}{example-image-b}%
712   \label{fig:second_case_ieee}}
713   \caption[Example figure with two sub figures.
714     ↪ IEEE style. (a) The first case. (b) The
715     ↪ second case.]
716   \label{fig:two_sub_figures_ieee}
717 \end{figure*}
```

J. Tables

Note that IEEE does not support `\begin{table}`, one has to use `\begin{figure}`.

Corresponding L^AT_EX code of ./paper-minted.tex

```
721 \begin{figure}
722   \caption[Simple Table]
723   \label{tab:simple}
724   \centering
725   \begin{tabular}{ll}
726     \toprule
727     Heading1 & Heading2 \\
728     \midrule
729     One      & Two      \\
730     Three    & Four     \\
731     \bottomrule
732   \end{tabular}
733 \end{figure}
```

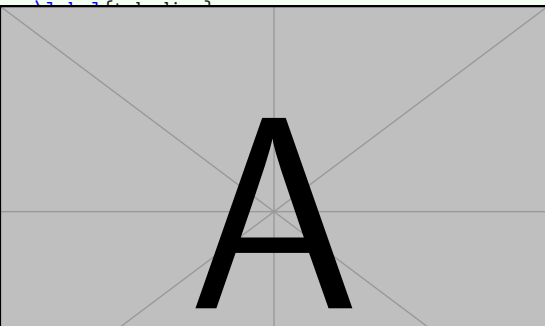
16 × 9

(Original size: 320 × 180 bp)

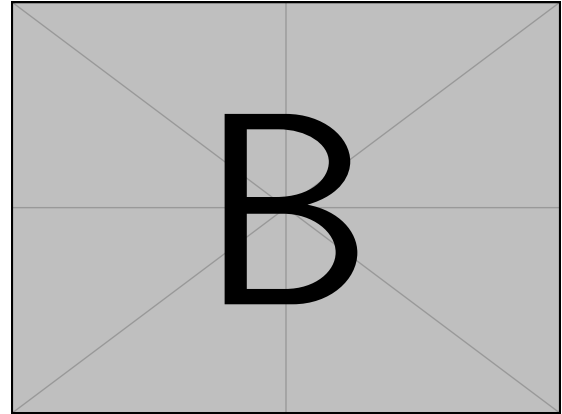
Figure 4: 16x9 Figure

Corresponding L^AT_EX code of ./paper-minted.tex

```
737 % Source:
738 ↪ https://tex.stackexchange.com/a/468994/9075
739 \begin{figure}
740 \caption{Table with diagonal line}
741
742
743
744
745
746
747
748
749
750
```

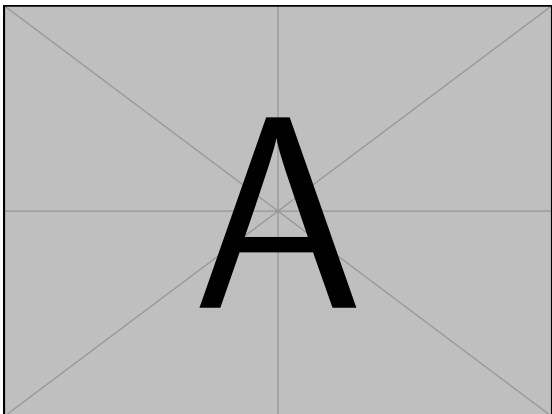
A large black letter 'A' is centered on a light gray background. A thin gray diagonal line runs from the top-left corner to the bottom-right corner, passing through the center of the 'A'. The background is divided into four quadrants by a horizontal and a vertical gray line that intersect at the center of the 'A'.

(a) Case I

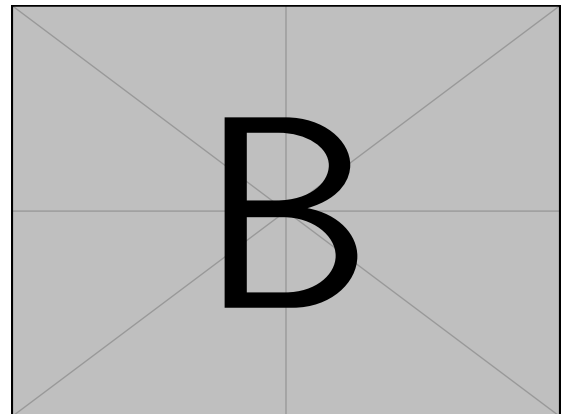


(b) Case II

Figure 5: Example figure with two sub figures.



(a)



(b)

Figure 6: Example figure with two sub figures. IEEE style. (a) The first case. (b) The second case.

Figure 7: Simple Table

Heading1	Heading2
One	Two
Thee	Four

Figure 8: Table with diagonal line

Diag Column Head I	Diag Column Head II	Second	Third
		foo	bar

K. Source Code

minted is a sophisticated package to enable properly highlighted listings. It uses the pygments library, which in turn requires Python.

Listing 1 shows source code written in XML. line 2 contains a comment.

```

1 <listing name="example">
2   <!-- comment -->
3   <content>not interesting</content>
4 </listing>

```

List. 1: Example XML listing using minted

Corresponding L^AT_EX code of ./paper-minted.tex

```

760 \Cref{lst:XML} shows source code written in
761 ↪ XML.
762 \refline{line:comment} contains a comment.
763 \begin{listing}[htbp]
764   \begin{
765     ↪ minted}[linenos=true,escapeinside=||]{
766     ↪ xml}
767   <listing name="example">
768     <!-- comment --> |\labelline{line:comment}|
769     <content>not interesting</content>
770   </listing>
771   \end{minted}
772   \caption{Example XML listing using minted}
773   \label{lst:XML}
774 \end{listing}

```

One can also typeset JSON as shown in Listing 2.

```

1 {
2   key: "value"
3 }

```

List. 2: Example JSON listing using minted

Corresponding L^AT_EX code of ./paper-minted.tex

```

778 \begin{listing}[htbp]
779   \begin{
780     ↪ minted}[linenos=true,escapeinside=||]{
781     ↪ json}
782   {
783     key: "value"
784   }
785   \end{minted}
786   \caption{Example JSON listing using minted}
787   \label{lst:f1JSON}
788 \end{listing}

```

Java is also possible as shown in Listing 3.

```

1 public class Hello {
2     public static void main (String[] args) {
3         System.out.println("Hello World!");
4     }
5 }

```

List. 3: Java code rendered using minted

Corresponding L^AT_EX code of ./paper-minted.tex

```

792 \begin{listing}[htbp]
793   \begin{
794     ↪ minted}[linenos=true,escapeinside=||]{
795     ↪ java}
796   public class Hello {
797     public static void main (String[] args) {
798         System.out.println("Hello World!");
799     }
800   }
801   \end{minted}
802   \caption{Java code rendered using minted}
803   \label{lst:f1Java}
804 \end{listing}

```

L. Itemization

One can list items as follows:

- Item One
- Item Two

Corresponding L^AT_EX code of ./paper-minted.tex

```

810 \begin{itemize}
811   \item Item One
812   \item Item Two
813 \end{itemize}

```

With the package paralist, one can create itemizations with lesser spacing:

- Item One
- Item Two

Corresponding L^AT_EX code of ./paper-minted.tex

```
819 \begin{compactitem}
820 \item Item One
821 \item Item Two
822 \end{compactitem}
```

One can enumerate items as follows:

- 1) Item One
- 2) Item Two

Corresponding L^AT_EX code of ./paper-minted.tex

```
828 \begin{enumerate}
829 \item Item One
830 \item Item Two
831 \end{enumerate}
```

With the package paralist, one can create enumerations with lesser spacing:

- 1) Item One
- 2) Item Two

Corresponding L^AT_EX code of ./paper-minted.tex

```
837 \begin{compactenum}
838 \item Item One
839 \item Item Two
840 \end{compactenum}
```

With paralist, one can even have all items typeset after each other and have them clean in the TeX document:

1) All these items... 2) ...appear in one line 3) This is enabled by the paralist package.

Corresponding L^AT_EX code of ./paper-minted.tex

```
846 \begin{inparaenum}
847 \item All these items...
848 \item ...appear in one line
849 \item This is enabled by the paralist
      ↪ package.
850 \end{inparaenum}
```

M. Other Features

The words “workflow” and “dwarflike” can be copied from the PDF and pasted to a text file.

Corresponding L^AT_EX code of ./paper-minted.tex

```
856 The words \enquote{workflow} and
      ↪ \enquote{dwarflike} can be copied from the
      ↪ PDF and pasted to a text file.
```

The symbol for powerset is now correct: \wp and not a Weierstrass p (\wp).

$\wp(1,2,3)$

Corresponding L^AT_EX code of ./paper-minted.tex

```
860 The symbol for powerset is now correct:
      ↪ $\powerset$ and not a Weierstrass p
      ↪ ($\wp$).
861
862 $\powerset(\{1,2,3\})$
```

Brackets work as designed: <test> One can also input backticks in verbatim text: `test`.

Corresponding L^AT_EX code of ./paper-minted.tex

```
866 Brackets work as designed:
867 <test>
868 One can also input backticks in verbatim text:
      ↪ \verb|`test`|.
```

IV. CONCLUSION AND OUTLOOK

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

ACKNOWLEDGMENT

Identification of funding sources and other support, and thanks to individuals and groups that assisted in the research and the preparation of the work should be included in an acknowledgment section, which is placed just before the reference section in your document [4].

In the bibliography, use \textsuperscript for “st”, “nd”, ...: E.g., “The 2nd conference on examples”. When you use JabRef, you can use the clean up command to achieve

that. See <https://help.jabref.org/en/CleanupEntries> for an overview of the cleanup functionality.

REFERENCES

- [1] O. Kopp *et al.*, “Winery – A Modeling Tool for TOSCA-based Cloud Applications,” in *Proceedings of 11th International Conference on Service-Oriented Computing (ICSOC’13)*, ser. LNCS, vol. 8274. Springer Berlin Heidelberg, 2013, pp. 700–704.
- [2] T. Binz, G. Breiter, F. Leymann, and T. Spatzier, “Portable Cloud Services Using TOSCA,” *IEEE Internet Computing*, vol. 16, no. 03, pp. 80–85, May 2012.
- [3] M. Scharrer, *The mwe Package*, 2017. [Online]. Available: <http://texdoc.net/mwe>
- [4] B. Veytsman, “Latex class for the association for computing machinery – acknowledgement information,” Aug. 2021. [Online]. Available: <https://github.com/borisveytsman/acmart/blob/1704c8bf7eee92a1515ff755f5118b6a22bb1f8e/samples/samples.dtx#L709>

All links were last followed on October 5, 2020.