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

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***Abstract*—Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer 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, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer 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 metu  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 LaTeX (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. LaTeX Hints

This section contains hints on writing LaTeX. 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 LaTeX, this does not lead to a new paragraph as LaTeX 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 LaTeX, 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 LaTeX code of ./paper.tex

```
579 œŒéűŰőŐ
580 One sentence per line.
581 This rule is important for the usage of version
        control systems.
582 A new line is generated with a blank line.
583 As you would do in Word:
584 New paragraphs are generated by pressing enter.
585 In LaTeX, this does not lead to a new paragraph
        as LaTeX joins subsequent lines.
586 In case you want a new paragraph, just press
        enter twice!
587 This leads to an empty line.
588 In word, there is the functionality to press
        shift and enter.
589 This leads to a hard line break.
590 The text starts at the beginning of a new line.
591 In LaTeX, you can do that by using two
        backslashes (\textbackslash\textbackslash).
592 \\
593 This is rarely used.
594
595 Please do \textit{not} use two backslashes for
        new paragraphs.
596 For instance, this sentence belongs to the same
        paragraph, whereas the last one started a
        new one.
597 A long motivation for that is provided at
        \url{http://loopspace.mathforge.org/HowDidIDoThat/T
```

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 LaTeX code of ./paper.tex

```
604 œŒéűŰőŐ
605 \begin{mindflow}
606 This is a small note.
607 \end{mindflow}
```

C. Handling TODOs

Markierter Text.

Corresponding LaTeX code of ./paper.tex

```
612 œŒéűŰőŐ
613 \textmarker{Markierter Text.}
```

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

Markierter Text.

Corresponding LaTeX code of ./paper.tex

```
618 œŒéűŰőŐ
619 \textcomment{Markierter Text.}{Kommentar dazu.}
```

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

Corresponding LaTeX code of ./paper.tex

```
622 œŒéűŰőŐ
623 \modified{Manuelle Markierung für Text, der seit
        der letzten Version geändert wurde.}
```

Das ist ein Text. Geänderter Text.

Corresponding LaTeX code of ./paper.tex

```
626 œŒéűŰőŐ
627 Das ist ein Text.
628 \change{FL1: Text angepasst}{Geänderter Text}.
```

Hier nur ein Kommentar.

Corresponding LaTeX code of ./paper.tex

```
631 œŒéűŰőŐ
632 Hier nur ein Kommentar\sidecomment{Kommentar}.
```

TODO!

Corresponding LaTeX code of ./paper.tex

```
635 œŒéűŰőŐ
636 \todo{Hier muss noch kräftig Text produziert
        werden}
```

D. Hyphenation

LaTeX 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: applica tion-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 LaTeX code of ./paper.tex

```
œŒúŰőŐ
In case you write
     \enquote{application-specific}, then the
     word will only be hyphenated at the dash.
You can also write
     \verb1applica\allowbreak{}tion-specific1
     (result:
     applica\allowbreak{}tion-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, \verb1application"=specific1 gets
     application"=specific.
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 $\frac{\mathrm{km}}{\mathrm{h}}$, or by using plain LaTeX (and math mode): 100 $\frac{km}{h}$.

Corresponding LaTeX code of ./paper.tex

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

5 % of 10 kg

Corresponding LaTeX code of ./paper.tex

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

Numbers are automatically grouped: 123 456.

Corresponding LaTeX code of ./paper.tex

```
œŒúŰőŐ
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 LaTeX code of ./paper.tex

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

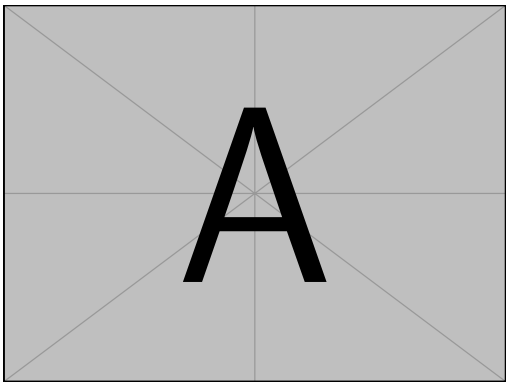


Figure 1. Example figure for cref demo

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 LaTeX code of ./paper.tex

```
œŒúŰőŐ
\Cref{fig:ex:cref} shows a simple fact, although
     \cref{fig:ex:cref} could also show
     something else.

\Cref{tab:ex:cref} shows a simple fact, although
     \cref{tab:ex:cref} could also show
     something else.

\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.

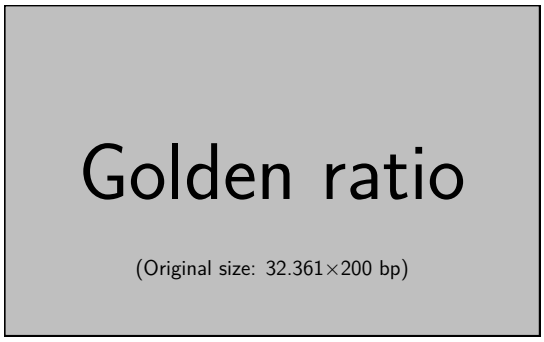


Figure 3. Simple Figure. Based on Scharrer [3].

Corresponding LaTeX code of ./paper.tex

```
œĞúŰőŐ
\Cref{fig:label} shows something interesting.

\begin{figure}
  \centering
  \includegraphics[width=.8\linewidth]{example-image-golden}
  \caption[Simple Figure]{
    Simple Figure.
    Based on \citet{mwe}.
  }
  \label{fig:label}
\end{figure}
```

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

Corresponding LaTeX code of ./paper.tex

```
œĞúŰőŐ
\begin{figure*}
  \centering
  % note that \textwidth is used instead of
       \linewidth
  % This ensures that the graphics width is 60%
       of the "page" (text block), and not just
       60% of the current text column
  % See
       https://tex.stackexchange.com/a/17085/9075
       for details
  \includegraphics[width=.6\textwidth]{example-image-16x
  \caption{16x9 Figure}
  \label{fig:16x9}
\end{figure*}
```

I. Sub Figures

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

Corresponding LaTeX code of ./paper.tex

```
œĞúŰőŐ
\begin{figure*}[!b]
  \centering
  \subfloat[Case
       I]{\includegraphics[width=.4\linewidth]{example-image-a}
    \label{fig:first_case}}
  \hfil
  \subfloat[Case
       II]{\includegraphics[width=.4\linewidth]{example-image-b
    \label{fig:second_case}}
  \caption{Example figure with two sub figures.}
  \label{fig:two_sub_figures}
\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 LaTeX code of ./paper.tex

```
œĞúŰőŐ
\begin{figure*}[!b]
  \centering
  \subfloat[]{\includegraphics[width=.4\linewidth]{example-imag
    \label{fig:first_case_ieee}}
  \hfil
  \subfloat[]{\includegraphics[width=.4\linewidth]{example-imag
    \label{fig:second_case_ieee}}
  \caption{Example figure with two sub figures.
       IEEE style. (a) The first case. (b) The
       second case.}
  \label{fig:two_sub_figures_ieee}
\end{figure*}
```

J. Tables

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

Corresponding LaTeX code of ./paper.tex

```
œĞúŰőŐ
\begin{figure}
  \caption{Simple Table}
  \label{tab:simple}
  \centering
  \begin{tabular}{ll}
    \toprule
    Heading1 & Heading2 \\
    \midrule
    One      & Two      \\
    Thee     & Four     \\
    \bottomrule
  \end{tabular}
\end{figure}
```

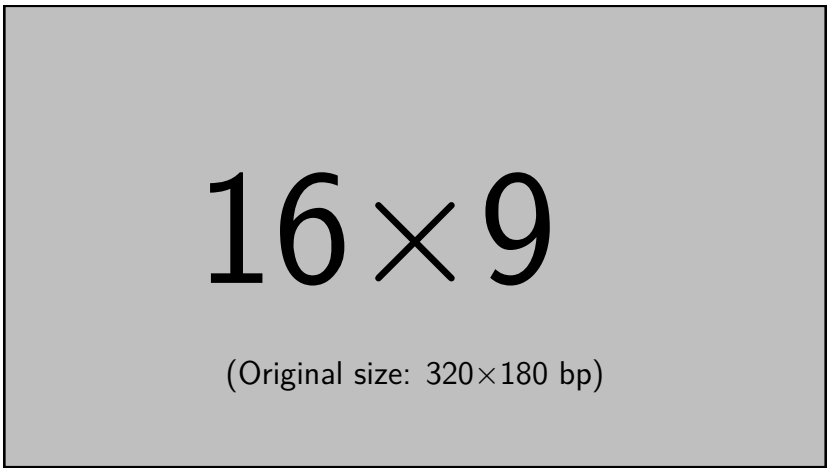
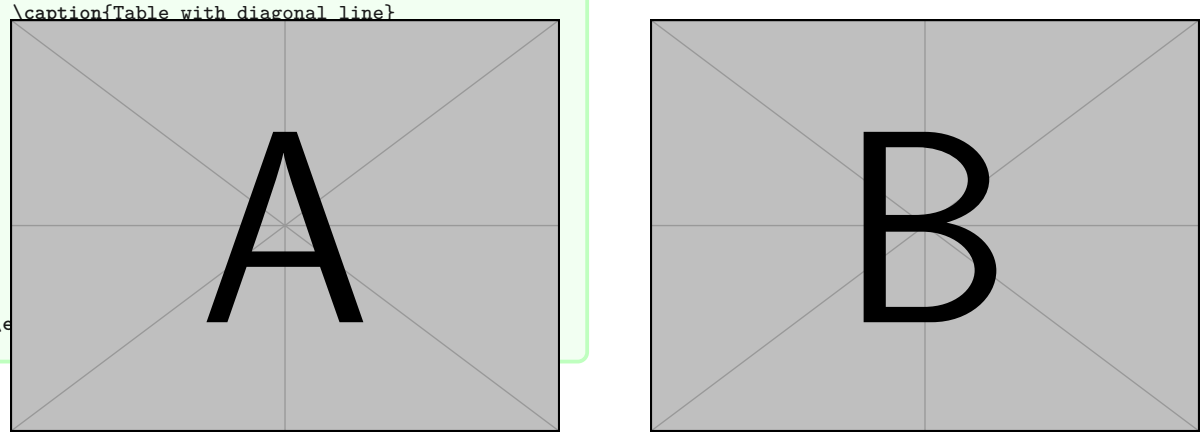


Figure 4. 16x9 Figure

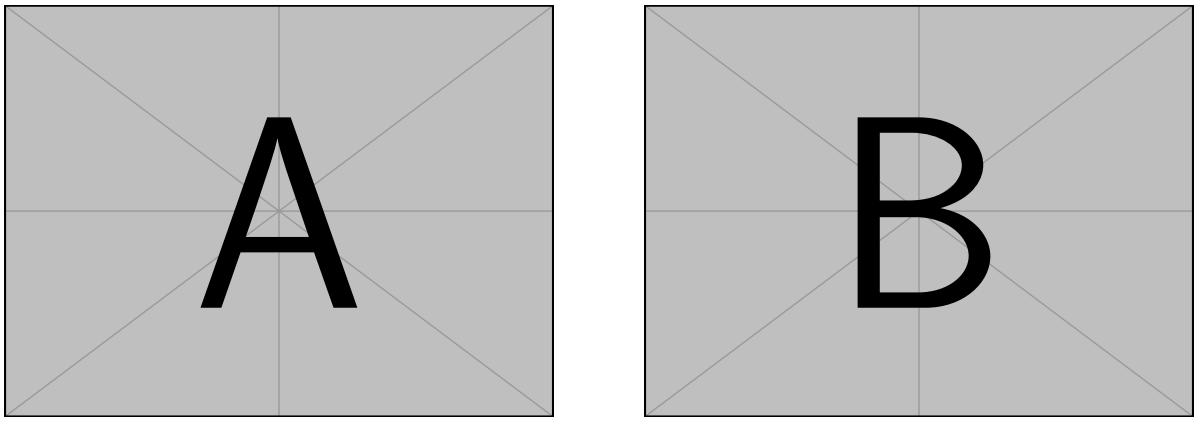
Corresponding LaTeX code of `./paper.tex`

```
805 œŒűŰőŐ
806 % Source:
        https://tex.stackexchange.com/a/468994/9075
807 \begin{figure}
808   \caption{Table with diagonal line}
809
810
811
812
813
814
815
816
817
818
819 \e
```



(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 II / Diag Column Head I	Second	Third
	foo	bar

K. Source Code

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

```
<listing name="example">
  <!-- comment -->
  <content>not interesting</content>
</listing>
```

Listing 1. Example XML Listing

Corresponding LaTeX code of `./paper.tex`

```
œŒüŰőŐ
\Cref{lst:XML} shows source code written in XML.
\Cref{line:comment} contains a comment.

\begin{lstlisting}[
  language=XML,
  caption={Example XML Listing},
  label={lst:XML}]
<listing name="example">
  <!-- comment --> (* \label{line:comment} *)
  <content>not interesting</content>
</listing>
\end{lstlisting}
```

One can also add `float` as parameter to have the listing floating. Listing 2 shows the floating listing.

```
<listing name="example">
  Floating
</listing>
```

Listing 2. Example XML listing – placed as floating figure

```
{
  key: "value"
}
```

Listing 3. Example JSON listing – placed as floating figure

```
public class Hello {
    public static void main (String[] args) {
        System.out.println("Hello World!");
    }
}
```

Listing 4. Example Java listing

Corresponding LaTeX code of `./paper.tex`

```
œŒüŰőŐ
\begin{lstlisting}[
  % one can adjust spacing here if required
  % aboveskip=2.5\baselineskip,
  % belowskip=-.8\baselineskip,
  float,
  language=XML,
  caption={Example XML listing -- placed as
       floating figure},
  label={lst:flXML}]
<listing name="example">
  Floating
</listing>
\end{lstlisting}
```

One can also typeset JSON as shown in Listing 3.

Corresponding LaTeX code of `./paper.tex`

```
œŒüŰőŐ
\begin{lstlisting}[
  float,
  language=json,
  caption={Example JSON listing -- placed as
       floating figure},
  label={lst:json}]
{
  key: "value"
}
\end{lstlisting}
```

Java is also possible as shown in Listing 4.

Corresponding LaTeX code of `./paper.tex`

```
œŒüŰőŐ
\begin{lstlisting}[
  caption={Example Java listing},
  label=lst:java,
  language=Java,
  float]
public class Hello {
    public static void main (String[] args) {
        System.out.println("Hello World!");
    }
}
\end{lstlisting}
```

L. Itemization

One can list items as follows:

- Item One
- Item Two

Corresponding LaTeX code of `./paper.tex`

```
892 œŒúŰőŐ
893 \begin{itemize}
894   \item Item One
895   \item Item Two
896 \end{itemize}
```

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

- Item One
- Item Two

Corresponding LaTeX code of `./paper.tex`

```
901 œŒúŰőŐ
902 \begin{compactitem}
903   \item Item One
904   \item Item Two
905 \end{compactitem}
```

One can enumerate items as follows:

1) Item One
2) Item Two

Corresponding LaTeX code of `./paper.tex`

```
910 œŒúŰőŐ
911 \begin{enumerate}
912   \item Item One
913   \item Item Two
914 \end{enumerate}
```

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

1) Item One
2) Item Two

Corresponding LaTeX code of `./paper.tex`

```
919 œŒúŰőŐ
920 \begin{compactenum}
921   \item Item One
922   \item Item Two
923 \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 LaTeX code of `./paper.tex`

```
928 œŒúŰőŐ
929 \begin{inparaenum}
930   \item All these items...
931   \item ...appear in one line
932   \item This is enabled by the paralist package.
933 \end{inparaenum}
```

M. Other Features

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

Corresponding LaTeX code of `./paper.tex`

```
938 œŒúŰőŐ
939 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: $\powerset$ and not a Weierstrass p ($\wp$).
$\powerset(1,2,3)$

Corresponding LaTeX code of `./paper.tex`

```
942 œŒúŰőŐ
943 The symbol for powerset is now correct:
        $\powerset$ and not a Weierstrass p ($\wp$).
944
945 $\powerset({1,2,3})$
```

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

Corresponding LaTeX code of `./paper.tex`

```
948 œŒúŰőŐ
949 Brackets work as designed:
950 <test>
951 One can also input backticks in verbatim text:
        \verb|`test`|.
```

IV. Conclusion and Outlook

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer 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.