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

First Author, Second Author
University of Examples, Germany
{lastname}@example.org

Third Author
School of Electrical and
Computer Examples
Georgia Institute of Examples
Atlanta, Georgia 30332–0250
http://www.example.org

***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.**

A. 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 metus eu enim. Vestibulum pellentesque felis eu massa.

The remainder of the paper starts with a presentation of related work (Section -B). It is followed by a presentation of hints on LaTeX (**??**).Finally, a conclusion is drawn and outlook on future work is made (Section II).

B. Related Work

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

I. 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-conference-minted.tex

```
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 (\textbackslash\textbackslash).\\
This is rarely used.

Please do \textit{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 \url{http://loopspace.mathforge.org/HowDidIDoThat/TeX/VCS/#section.3}
```

B. Hyphenation

LaTeX automatically hyphenates words. When using microtype, there should be less hypnetations 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 LaTeX code of paper-conference-minted.tex

```
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.
```

C. Typesetting Units

Numbers can written plain text (such as 100), by using the siunitx package like that: $100\,\frac{\mathrm{km}}{\mathrm{h}}$, or by using plain LaTeX (and math mode): $100\,\frac{km}{h}$.

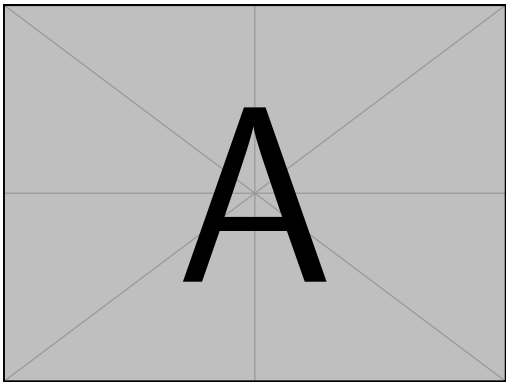


Figure 1: Example figure for cref demo

Corresponding LaTeX code of paper-conference-minted.tex

```
Numbers can written plain text (such as 100), by using the siunitx package like that:
\SI{100}{\km\per\hour},
or by using plain \LaTeX{} (and math mode):
$100 \frac{\mathit{km}}{h}$.
```

$5\,\%$ of $10\,\mathrm{kg}$

Corresponding LaTeX code of paper-conference-minted.tex

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

Numbers are automatically grouped: $123\,456$.

Corresponding LaTeX code of paper-conference-minted.tex

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

D. Surrounding Text by Quotes

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

Corresponding LaTeX code of paper-conference-minted.tex

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

```

E. 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 I-E shows a simple fact, although Section I-E could also show something else.

Heading1	Heading2
One	Two
Thee	Four

Figure 2: Example table for cref demo

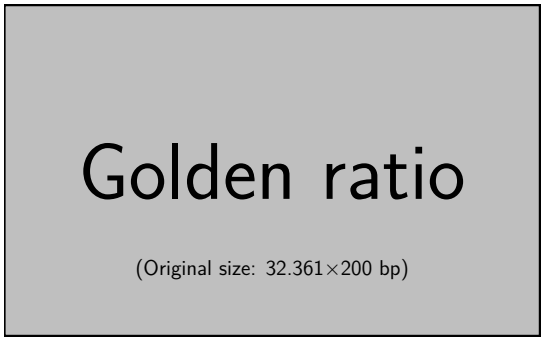


Figure 3: Simple Figure. Based on Scharrer [3].

Corresponding LaTeX code of paper-conference-minted.tex

```
458 \Cref{fig:ex:cref} shows a simple fact, although
    ↪ \cref{fig:ex:cref} could also show something else.
459
460 \Cref{tab:ex:cref} shows a simple fact, although
    ↪ \cref{tab:ex:cref} could also show something else.
461
462 \Cref{sec:ex:cref} shows a simple fact, although
    ↪ \cref{sec:ex:cref} could also show something else.
```

F. Figures

Figure 3 shows something interesting.

Corresponding LaTeX code of paper-conference-minted.tex

```
467 \Cref{fig:label} shows something interesting.
468
469 \begin{figure}
470   \centering
471   \includegraphics[width=.8\columnwidth]{example-image-golden}
472   \caption[Simple Figure]{Simple Figure. Based on
      ↪ \citet{mwe}.}
473   \label{fig:label}
474 \end{figure}
```

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

Corresponding LaTeX code of paper-conference-minted.tex

```
482 \begin{figure*}
483   \centering
484   % note that \textwidth is used instead of \columnwidth
485   % This ensures that the graphics width is 60% of the "page",
      ↪ and not just 60% of the current text column
486   % See https://tex.stackexchange.com/a/16956/9075 for details
487   \includegraphics[width=.6\textwidth]{example-image-16x9}
488   \caption{16x9 Figure}
489   \label{fig:16x9}
490 \end{figure*}
```

G. Sub Figures

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

Corresponding LaTeX code of paper-conference-minted.tex

```
499 \begin{figure*}[!b]
500     \centering
501     \subfloat[Case
        ↪ I]{\includegraphics[width=.4\columnwidth]{example-image-a}%
502     \label{fig:first_case}}
503   \hfil
504     \subfloat[Case
        ↪ II]{\includegraphics[width=.4\columnwidth]{example-image-b}%
505     \label{fig:second_case}}
506   \caption{Example figure with two sub figures.}
507   \label{fig:two_sub_figures}
508 \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-conference-minted.tex

```
521 \begin{figure*}[!b]
522     \centering
523
        ↪ \subfloat[]{\includegraphics[width=.4\columnwidth]{example-image-a}%
524     \label{fig:first_case_ieee}}
525   \hfil
526
        ↪ \subfloat[]{\includegraphics[width=.4\columnwidth]{example-image-b}%
527     \label{fig:second_case_ieee}}
528   \caption{Example figure with two sub figures. IEEE style.
      ↪ (a) The first case. (b) The second case.}
529   \label{fig:two_sub_figures_ieee}
530 \end{figure*}
```

H. Tables

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

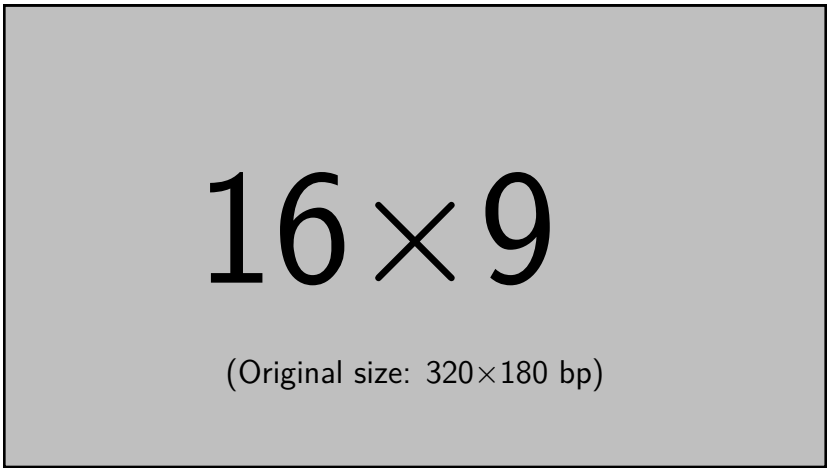


Figure 4: 16x9 Figure

Corresponding LaTeX code of paper-conference-minted.tex

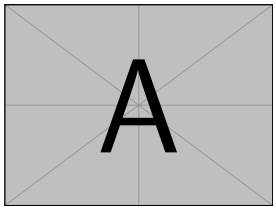
```
\begin{figure}
  \caption{Simple Table}
  \label{tab:simple}
  \centering
  \begin{tabular}{ll}
    \toprule
    Heading1 & Heading2 \\
    \midrule
    One      & Two      \\
    Thee     & Four     \\
    \bottomrule
  \end{tabular}
\end{figure}
```

Figure 7: Simple Table

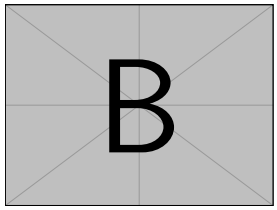
Heading1	Heading2
One	Two
Thee	Four

Figure 8: Table with diagonal line

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

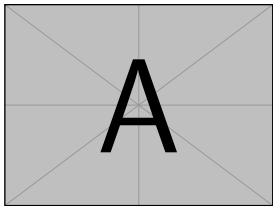


(a) Case I

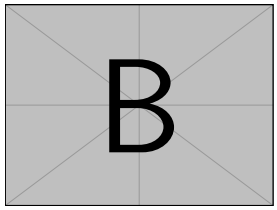


(b) Case II

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.

Corresponding LaTeX code of paper-conference-minted.tex

```
% Source: https://tex.stackexchange.com/a/468994/9075
\begin{figure}
\caption{Table with diagonal line}
\label{tab:diag}
\begin{center}
\begin{tabular}{|l|c|c|}
\hline
\diagbox[width=10em]{Diag\\Column Head I}{Diag Column\\Head II} & Second & Third \\
\hline
& foo & bar \\
\hline
\end{tabular}
\end{center}
\end{figure}
```

I. Source Code

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

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

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

List. 1: Example XML listing using minted

Corresponding LaTeX code of paper-conference-minted.tex

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

\begin{listing}[htbp]
    \begin{minted}[linenos=true,escapeinside=||]{xml}
<listing name="example">
  <!-- comment --> |\labelline{line:comment}|
  <content>not interesting</content>
</listing>
\end{minted}
  \caption{Example XML listing using minted}
  \label{lst:XML}
\end{listing}
```

One can also typeset JSON as shown in Listing 2.

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

List. 2: Example JSON listing using minted

Corresponding LaTeX code of paper-conference-minted.tex

```
\begin{listing}[htbp]
    \begin{minted}[linenos=true,escapeinside=||]{json}
{
  key: "value"
}
\end{minted}
  \caption{Example JSON listing using minted}
  \label{lst:flJSON}
\end{listing}
```

Java is also possible as shown in **??**.

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

List. 3: Java code rendered using minted

Corresponding LaTeX code of paper-conference-minted.tex

```
\begin{listing}[htbp]
    \begin{minted}[linenos=true,escapeinside=||]{java}
public class Hello {
    public static void main (String[] args) {
        System.out.println("Hello World!");
    }
}
\end{minted}
  \caption{Java code rendered using minted}
  \label{lst:java}
\end{listing}
```

J. Itemization

One can list items as follows:

- Item One
- Item Two

Corresponding LaTeX code of paper-conference-minted.tex

```
\begin{itemize}
\item Item One
\item Item Two
\end{itemize}
```

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

- Item One
- Item Two

Corresponding LaTeX code of paper-conference-minted.tex

```
\begin{compactitem}
\item Item One
\item Item Two
\end{compactitem}
```

One can enumerate items as follows:

1) Item One
2) Item Two

Corresponding LaTeX code of paper-conference-minted.tex

```
\begin{enumerate}
  \item Item One
  \item Item Two
\end{enumerate}
```

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

1) Item One
2) Item Two

Corresponding LaTeX code of paper-conference-minted.tex

```
\begin{compactenum}
  \item Item One
  \item Item Two
\end{compactenum}
```

With paralist, one can even have all items typset 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-conference-minted.tex

```
\begin{inparaenum}
  \item All these items...
  \item ...appear in one line
  \item This is enabled by the paralist package.
\end{inparaenum}
```

K. Other Features

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

Corresponding LaTeX code of paper-conference-minted.tex

```
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-conference-minted.tex

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

$\powerset({1,2,3})$
```

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

Corresponding LaTeX code of paper-conference-minted.tex

```
Brackets work as designed:
<test>
One can also input backquotes in verbatim text: \verb|`test`|.
```

II. Conclusion and Outlook