Working with figure environments in texor

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Abstract This is a small sample article to demonstrate usage of texor to convert figure environments.

1 Introduction

Images are an essential component in any article, However due to the differences in the support for various graphic formats between LaTeX and markdown/HTML we need to fallback on raster graphics. It is well summarized in the Table 1.

Graphics Format	LaTeX	Markdown	Rmarkdown	HTML
PNG	Yes	Yes	Yes	Yes
JPG	Yes	Yes	Yes	Yes
PDF	Yes	No	No	No
SVG	No	Yes	Yes	Yes
Tikz	Yes	No	Yes	No
Algorithm	Yes	No	No	No

Table 1: Image Format support in various Markup/Typesetting Languages

2 Image with width parameters

This section may contain a figure such as Figure 1. This is the most basic example of figure.

```
\begin{figure}[htbp]
  \centering
  \includegraphics[width=0.35\textwidth]{Rlogo-5.png}
  \caption{The logo of R.}
  \label{figure:rlogo}
\end{figure}
```

Figure 1: The logo of R.

3 Images in PDF format

Image 2 is a graphical representation of normal distribution.

```
\begin{figure}[htbp]
  \centering
  \includegraphics[width=0.5\textwidth]{normal}
  \caption{PDF of a normal distribution}
  \label{fig:normal}
\end{figure}
```

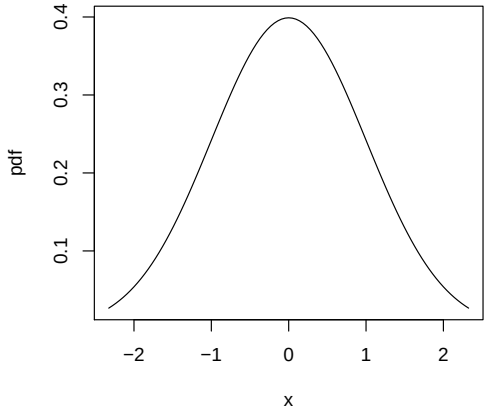

Figure 2: PDF of a normal distribution

4 Multiple images

Pandoc v3 and above now supports a new Figure object (Krewinkel, Lucero , 2023) which supports multiple images side by side or in a grid format.

Two or more Images side by side

```
\begin{figure}[htbp]
  \centering
 \includegraphics[width=0.45\textwidth]{Rlogo-5.png}\includegraphics[width=0.45\textwidth]{normal}
  \caption{Images side by side}
  \label{fig:twoimages}
\end{figure}
```

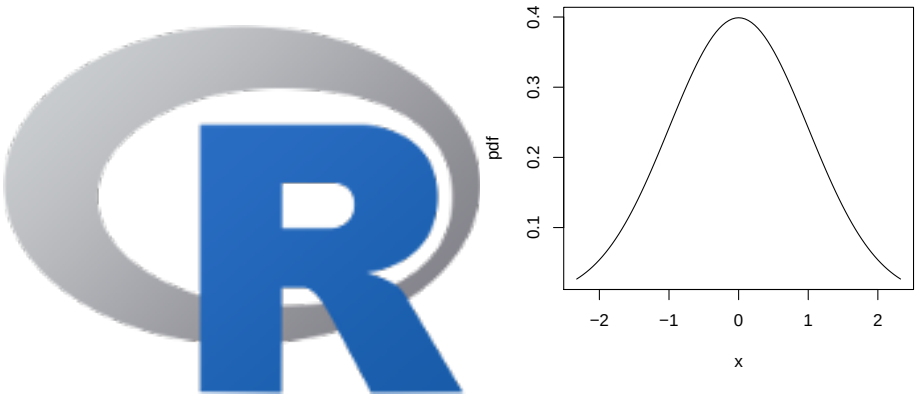

Figure 3: Images side by side

Four Images in a grid

```
\begin{figure}[htbp]
  \centering
 \includegraphics[width=0.45\textwidth]{Rlogo-5.png}\includegraphics[width=0.45\textwidth]{normal}
 \includegraphics[width=0.45\textwidth]{normal}\includegraphics[width=0.45\textwidth]{Rlogo-5.png}
```

```
  \caption{Multiple images in a grid}
  \label{fig:fourimages}
\end{figure}
```

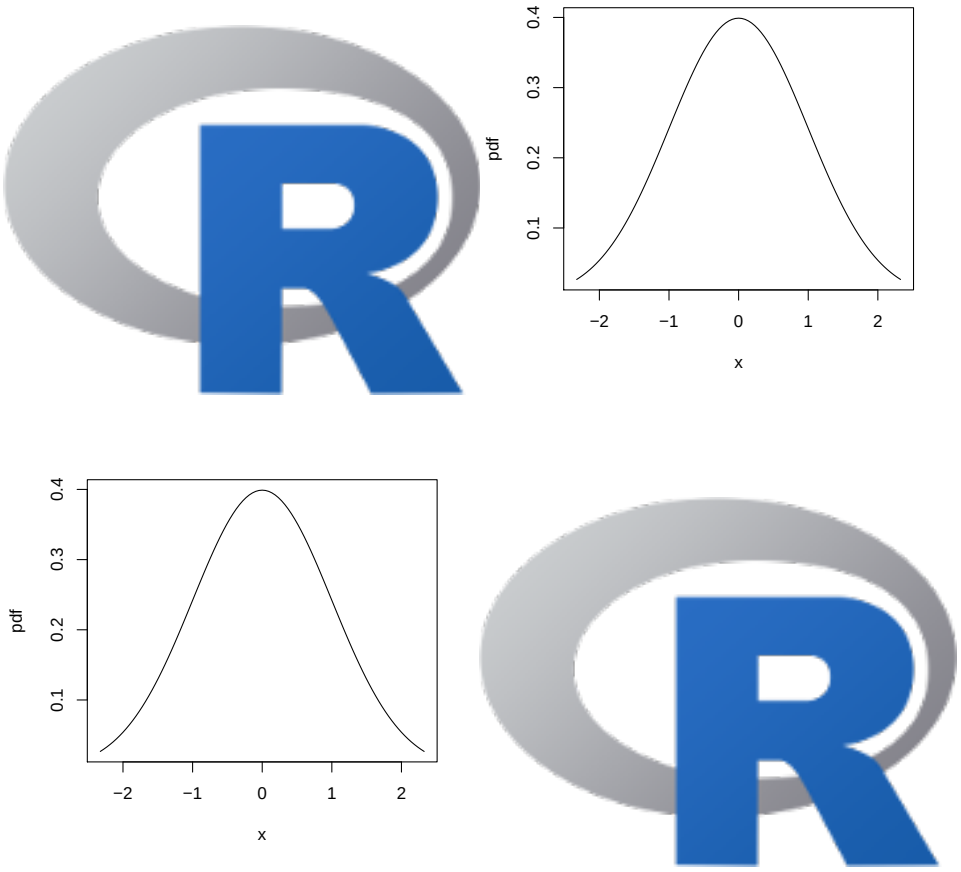

Figure 4: Multiple images in a grid

5 Tikz images

Here is a tikz image example in fig 5 adapted from (Cassidy, 2013).

Another interesting aspect of including tikz image here is that you can modify the source and re-convert without making any other changes. Figure will get updated in the generated html article.

Tikz Code:

The figure 5 is an example of how **texor** handles tikz images,

- First figures containing tikz images are isolated.
- Tikz libraries are fetched from the wrapper file,
- Tikz Code section is isolated into a standalone LaTeX file and compiled.
- The Compiled LaTeX file generates a PDF Image.
- This is then Converted again to PNG format as PDFs embedded in HTML wont look good.
- In the figure environment a line is added `\includegraphics{tikz/somefigure.png}`
- During the conversion in pandoc, a lua filter removes extra/unncessary text from the rest of the figure environemnt.

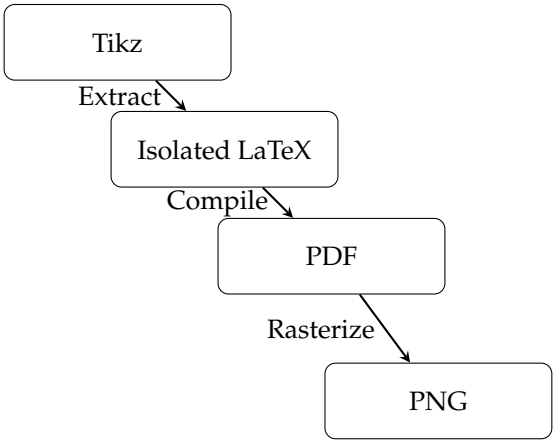

Figure 5: Tikz Image example

If You use **texor** to convert your articles using `texor::latex_to_web()` with `temp_mode=TRUE`(it is TRUE by default). The resultant Rmarkdown/HTML file will not modify the contents of your LaTeX file. In this case you can keep reloading the article after making changes to the tikz images, without having to do the above steps manually in case you are converting the article by hand.

6 Algorithm2e diagrams

we do support algorithm2e diagrams and images, these will be numbered differently and we strongly suggest to use "alg:" in labels for best results. Here is an example of algorithm 1, referenced from Fiorio (2017)

Data: this text
Result: how to write algorithm with LaTeX2e
initialization;
while *not at end of this document* **do**
  read current;
  if *understand* **then**
    go to next section;
    current section becomes this one;
  else
    go back to the beginning of current section;
  end
end

Algorithm 1: How to write algorithms

7 Other elements in figure objects

Figures can also house non-image environments like CodeBlocks and WideTables. This is the part where things start to look a bit different in the converted articles, CodeBlocks in figure environments would have numbering and caption that goes "Figure x:". However, when the same CodeBlock is converted to Rmarkdown, they are numbered as "CodeBlock x:". This distinguishes them from normal Images and matches with authors vision more appropriately.

As for Inclusion of widetables, since it houses two different tabular environments with the same caption, it would be treated as two different tables by pandoc sharing the same caption. This would not be the best solution hence, **texor** package uses Figure enviornment to house the widetables. This way they are distinguished well from normal tables, also the numbering scheme is seperated from figures "WideTable x:".

However one important thing to note is, the reference links and reference numbering would be shared with ones of the figures. So the changes that the package makes are cosmetic to captions. Like CodeBlock 1 below refers to 6. The number should have been 1 but instead it is 7.

```
code_in_figure <- function() {
  if (pandoc_version >= 3) {
    print("Code in Figure Supported")
  }
  else {
    print("code in Figure not supported")
  }
}
```

Figure 6: Example Code inside Figure environment

8 Summary

In summary the **texor** package supports:

- Almost all image formats in LaTeX.
- Algorithm and tikz as well in some capacity.
- Multiple images in grid,side-by-side configuration.
- Image Captions with Numbering and Labelling.

Bibliography

Josh Cassidy LaTeX Graphics using TikZ: A Tutorial for Beginners (Part 3)—Creating Flowcharts *Overleaf tutorials* 2013 URL https://www.overleaf.com/learn/latex/ [p3]

Christophe Fiorio algorithm2e.sty — package for algorithms, release 5.2 *CTAN*,2017 URL https://mirror.kku.ac.th/CTAN/macros/latex/contrib/algorithm2e/doc/algorithm2e.pdf [p4]

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