`tikzinput`: Selective Input of TIKZ Diagrams[*]

Michael Kohlhase
FAU Erlangen-Nürnberg
`http://kwarc.info/kohlhase`

November 7, 2020

Abstract

Running `tikz` takes a lot of time in LaTeXML, therefore it is often more efficient externalize the TIKZ pictures into separate (standalone) files, to let LaTeX handle the TIKZ pictures to generate an image, and just load it via the usual LaTeX graphics packages. The `tikzinput` package supports this workflow, and allows to switch back to native TIKZ via a package option.

Contents

---

[*]Version v1.0 (last revised 2019/03/20)

1 Introduction

Running `tikz` takes a lot of time in LaTeXML, therefore it is often more efficient externalize the TIKZ pictures into separate (standalone) files, to let LaTeX handle the TIKZ pictures to generate an image, and just load it via the usual LaTeX graphics packages. The `tikzinput` package supports this workflow, and allows to switch back to native TIKZ via a package option.

A side-effect of the workflow described above is that the TIKZ pictures can be developed – and formatted – independently of the document they are intended for. They can essentially be treated like an image file, which can be included into multiple documents.

2 The User Interface

2.1 Package Options

image   The behavior of the `tikzinput` package is determined by whether the `image` option is given. If it is not, then the `tikz` package is loaded, all other options are passed on to it and `\tikzinput{⟨file⟩}` inputs the TIKZ file ⟨file⟩`.tex`; if not, only the `graphicx` package is loaded and `\tikzinput{⟨file⟩}` loads an image file ⟨file⟩`.`⟨ext⟩ generated from ⟨file⟩`.tex`.

mh   The `mh` option turns on MathHub support; see [Koh20].

2.2 Inputting Standalone TIKZ Pictures

The selective input functionality of the `tikzinput` package assumes that the TIKZ pictures are externalized into a standalone picture file, such as the one Example 1.

```
\documentclass{standalone}
\usepackage{tikz}
\usetikzpackage{...}
\begin{document}
  \begin{tikzpicture}
     ...
  \end{tikzpicture}
\end{document}
```

Example 1: A Standalone TIKZ Picture File

The `standalone` class is a minimal LaTeX class that when loaded in a document that uses the `standalone` package: the preamble and the `document` environment are disregarded during loading, so they do not pose any problems. In effect, an `\input` of the file in Figure 1 only sees the `tikzpicture` environment, but the file itself is standalone in the sense that we can run LaTeX over it separately, e.g. for generating an image file from it.

This is exactly where the `tikzinput` package comes in: it supplies the `\tikzinput` macro, which – depending on the `image` option – either directly inputs the TIKZ picture (source) or tries to load an image file generated from it.

Concretely, if the `image` option is not set for the `tikzinput` package, then `\tikzinput[⟨opt⟩]{⟨file⟩}` disregards the optional argument ⟨opt⟩ and inputs ⟨file⟩`.tex` via `\input` and resizes it to as specified in the `width` and `height` keys. If it is, `\tikzinput[⟨opt⟩]{⟨file⟩}` expands to `\includegraphics[⟨opt⟩]{⟨file⟩}`.

`\tikzinput`

3 Limitations

In this section we document known limitations. If you want to help alleviate them, please feel free to contact the package author. Some of them are currently discussed in the sTEX GitHub repository [sTeX].

1. We only listen to the `width` and `height` keys in the tikz case, the others are disregarded.

4 Implementation

4.1 Package Options and Required Packages

\iftikzinput@image

EdN:1

We define a new switch `\iftikzinput@image` and the `image` option. Apart from that we accept all options that might come our way.[1]

```
1 ⟨∗package⟩
2 \newif\if@tikzinput@mh@\@tikzinput@mh@false
3 \DeclareOption{mh}{\@tikzinput@mh@true}
4 \newif\iftikzinput@image\tikzinput@imagefalse
5 \DeclareOption{image}{\tikzinput@imagetrue}
6 \DeclareOption*{}
7 \ProcessOptions
```

Next we require the packages we need, in the `image` case, we have to also provide "empty" versions of some TIKZ macros and environments that do not get defined as the `tikz` package is not loaded.

```
 8 \RequirePackage{stex-base}
 9 \if@tikzinput@mh@\RequirePackage{tikzinput-mh}\fi
10 \iftikzinput@image
11 \RequirePackage{graphicx}
12 \providecommand\usetikzlibrary[1]{}
13 \else
14 \RequirePackage{tikz}
15 \RequirePackage{standalone}
16 \fi
```

4.2 Inputting Standalone TIKZ Pictures

\tikzinput

Depending on the `image` option, we do the necessary things: either we default to the image, or we input the tikz file and resize it according to the `width` and `height` keys present.

```
17 \iftikzinput@image
18 \newcommand\tikzinput[2][]{\includegraphics[#1]{#2}}
19 \else
20 \newbox\tikzinput@box
21 \newcommand\tikzinput[2][]{\setkeys{Gin}{#1}%
22 \setbox\tikzinput@box\vbox{\input{#2}}%
23 \ifnum\ht\tikzinput@box=0%
24     \box\tikzinput@box%
25 \else\ifnum\wd\tikzinput@box=0%
26     \box\tikzinput@box%
27 \else
28 \ifx\Gin@ewidth\Gin@exclamation
29 \ifx\Gin@eheight\Gin@exclamation\box\tikzinput@box\else\resizebox{!}{\Gin@eheight}{\box\tikzinp
30 \else
31 \ifx\Gin@eheight\Gin@exclamation\resizebox{\Gin@ewidth}{!}{\box\tikzinput@box}
```

---

[1] EDNOTE: MK: Actually we would have liked to pass all options to TIKZ, but that does not work, since that is specific about its options.

```
32 \else\resizebox{\Gin@ewidth}{\Gin@eheight}{\box\tikzinput@box}\fi
33 \fi\fi\fi}
34 \fi
```

*tikzinput   The variants we define in terms of \tikzinput.

```
35 \newcommand\ctikzinput[2][]{\begin{center}\tikzinput[#1]{#2}\end{center}}
36 ⟨/package⟩
```

Change History

v1.0

    General: self-documenting package   1

References

[Koh20]   Michael Kohlhase. *MathHub Support for sTEX*. Tech. rep. 2020. URL: `https : / / github . com / sLaTeX / sTeX / raw / master / sty / mathhub / mathhub.pdf`.

[sTeX]   *sTeX: A semantic Extension of TeX/LaTeX*. URL: `https://github. com/sLaTeX/sTeX` (visited on 05/11/2020).