The Ti*k*Z-Extensions Package

Manual for version 0.6 (8)

`https://github.com/Qrrbrbirlbel/tikz-extensions`

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Part I
Introduction

1 Usage

This package is called `tikz-ext`, however, one can't load it via `\usepackage`.[1] Instead, this package consists mostly of PGF and Ti*k*Z libraries which are loaded by either `\usepgflibrary` or `\usetikzlibrary`.

2 Why do we need it?

Since I have been answering questions on TeX.sx I've noticed that some questions come up again and again, every time with a slightly different approach on how to solve them.

I don't like reinventing the wheel which is why I've gathered the solutions of my answers in this package.

3 Having problems?

Note however, that most of these extensions haven't been stress-tested properly and might be considered experimental.

Don't hesitate to open an issue on GitHub. You probably found a bug.

4 Namespaces and Ti*k*Z-Extensions macros

Since some parts of this package have existed in some form since 2013, the choice for key names and in which PGFkeys namespace they reside is not always optimal. They often reside in the main `/tikz` or `/pgf` path. Similar applies to macro names.

For future versions, it is planned to move those in the `/tikz/ext` namespace. For keys in the `/pgf` namespace, this will probably not happen since it makes it not very intuitive to use them in Ti*k*Z.

Starting from version 0.6, Ti*k*Z-Extensions provides commands that return the current version for compatibility testing. The second simply increments with every release so that the first doesn't need to be parsed.

`\tikzextversion`

Returns `0.6`.

`\tikzextversionnumber`

Returns `8`.

Also starting from version 0.6, there's `\tikzextset`.

`\tikzextset{`⟨*options*⟩`}`

This command will process the ⟨*options*⟩ using the `\pgfkeys` command with the default path set to `/tikz/ext`.

[1] Except for `pgfcalendar-ext` and `pgffor-ext`.

5 Compatibility with older versions

As discussed in the previous section, keys and commands of extensions that existed before version 0.6 that do not appear in this manual are considered deprecated.

`/tikz/ext/compat=pre 0.6|0.6|newest` (default `pre 0.6`)

This sets the global compatibility setting for every extension of this package (whether already loaded or not).

The following table shows the compatibility settings for each extension. A ✓ denotes an available setting where ✓✓ denotes the default compatibility setting.

Extension	pre 0.6	0.6	newest
`ext.scalepicture`	✓✓	–	
`ext.transformations.mirror`	✓✓	–	

For each available extension the compatibility setting can be adjusted as well after the extension is loaded.

`/tikz/ext/compat/scalepicture=`⟨*version*⟩ (default `pre 0.6`)
`/tikz/ext/compat/transformations.mirror=`⟨*version*⟩ (default `pre 0.6`)

It should be noted that at this point, a compatibility setting can be reversed since they only forward argument from an old key or command to the new version.

The changes are as follows.

pre 0.6 This version is different than the newest.

`scalepicture` The keys are in the `/tikz` name space instead of the `/tikz/ext` namespace.

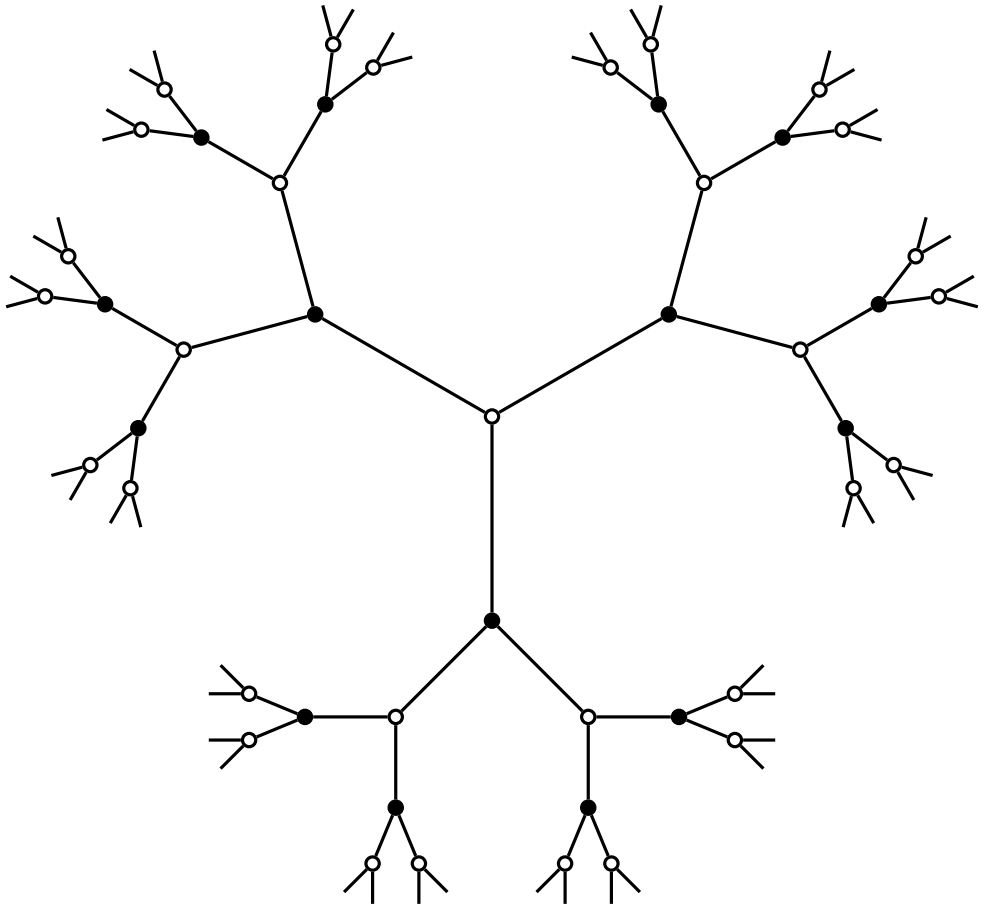
`transformations.mirror` The keys are in the `/tikz` name space instead of the `/tikz/ext` namespace. The commands of the PGF library start with `\pgf` instead of `\pgfext`.

0.6 No compatibility changes. Is the same as `newest`.

newest No compatibility changes.

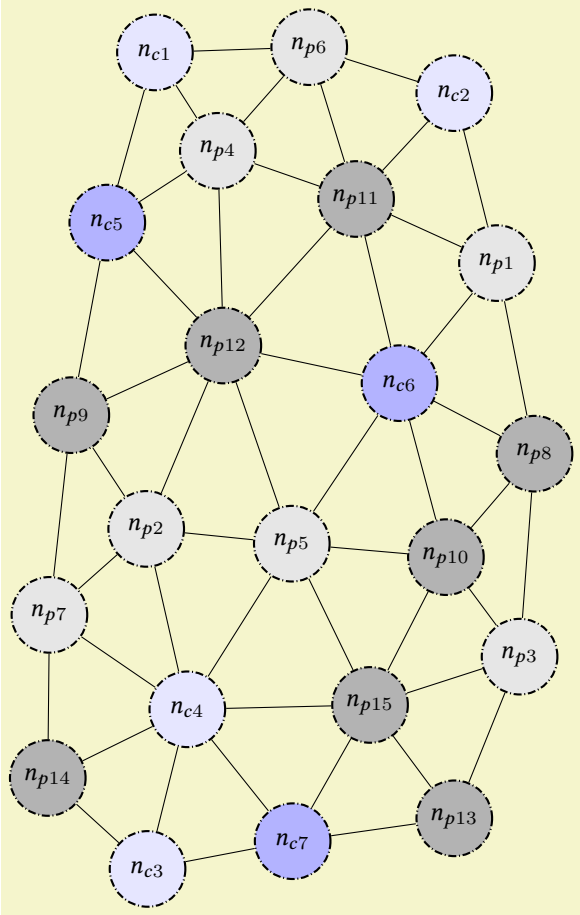
Part II
Ti*k*Z Libraries

These libraries only work with Ti*k*Z.



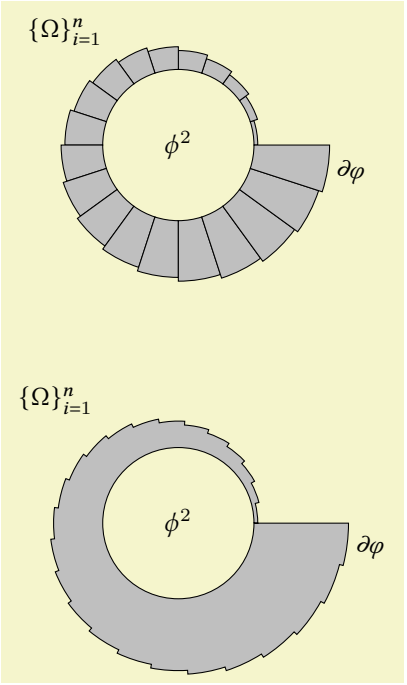
Part III
PGF Libraries

These libraries (should) work with both PGF and Ti*k*Z.




```
\usetikzlibrary {graphs,graphdrawing,ext.misc} \usegdlibrary {force}
\tikzset{
  mynode/.style={
    circle, minimum size=10mm, draw, densely dashdotted, thick,
    decide color/.expand once=#1},
  decide color/.style 2 args={
    /utils/TeX/if=c#1
      {/utils/TeX/ifnum={#2<5}{bluelight}{bluedark}}
      {/utils/TeX/ifnum={#2<8}{light}{dark}}},
  light/.style={fill=gray!20},  bluelight/.style={fill=blue!10},
  dark/.style ={fill=gray!60},  bluedark/.style ={fill=blue!30}}
\tikz\graph[
  spring electrical layout, vertical=c2 to p13,
  node distance=1.5cm, typeset=$n_{\tikzgraphnodetext}$,
  nodes={mynode=\tikzgraphnodetext}] {
  % outer ring
  c2 -- {p1, p11, p6};
    p1 -- {p8, c6, p11};
      p8 -- {p3, p10, c6};
       p3 -- {p13, p15, p10};
         p13 -- {p15, c7};
           c7  -- {c3, c4, p15};
           c3  -- {p14, c4};
           p14 -- {p7, c4};
         p7 -- {p9, p2, c4};
       p9 -- {c5, p12, p2};
     c5 -- {c1, p4, p12};
   c1 -- {p6, p4};
  p6 -- {p11, p4};
  % inner ring
  p11 -- {c6, p12, p4};
  p5 -- {c6 -- {p10, p12}, p10 -- p15, p15 -- c4, c4 -- p2, p2 -- p12, p12 -- p4};
};
```

Part IV
Utilities




```
\usetikzlibrary {ext.misc}
\begin{tikzpicture}[
  declare function={bigR(\n)=smallR+.05*\n;},
  declare constant={smallR=1; segments=20;},
  full arc=segments]
\foreach \iN[evaluate={\endRadius=bigR(\iN+1);}, use int=0 to segments-1]
  \filldraw[fill=gray!50] (\iN R:\endRadius)
    arc [radius=\endRadius, start angle=\iN R, delta angle=+1R] -- (\iN R+1R:smallR)
    arc [radius=smallR,       end angle=\iN R, delta angle=-1R] -- cycle;

\node                                              {$\phi^2$};
\node at (north west:{sqrt 2 * bigR(segments/2)})  {$\{\Omega\}_{i=1}^n$};
\node[rotate=-.5R, right] at (-.5R: bigR segments) {$\partial \varphi$};

\tikzset{yshift=-5cm, declare constant={segments=25;}, full arc=segments}
\filldraw[fill=gray!50] (right:smallR)
  \foreach \iN[evaluate={\endRadius=bigR(\iN+1);}, use int=0 to segments-1] {
    -- (\iN R:\endRadius) arc[radius=\endRadius, start angle=\iN R, delta angle=1R]}
    -- (right:smallR)     arc[radius=smallR,     start angle=0,     delta angle=-360];

\node                                              {$\phi^2$};
\node at (north west:{sqrt 2 * bigR(segments/2)})  {$\{\Omega\}_{i=1}^n$};
\node[rotate=-.5R, right] at (-.5R: bigR segments) {$\partial \varphi$};
\end{tikzpicture}
```

Part V
Changelog, Index & References

Changelog

Version 0.6 (2024-07-27)

- Added `\tikzextset`, `\tikzextversion` and `\tikzextversionnumber`
- Added six new `auto` placement mechanisms: `ext/above`, `ext/below`, `ext/west`, `ext/east`, `ext/north` and `ext/south`.
- Added `ext/auto offset` for `auto` placement.
- Added `ext/precise auto angle`.
- Added Ti*k*Z library `ext.arrows-plus`.
- Added Ti*k*Z library `ext.topaths.autobend`.
- Made `ext.node-families` and `ext.scalepicture` memoizable.

Version 0.5.1 (2023-04-02)

- Added PGF library `ext.arrows`.
- Bugfix to `ext.pgfkeys-plus`. [2]

Version 0.5 (2023-03-17)

- Added package `pgffor-ext`.
- Added Ti*k*Z library `ext.nodes`.
- Added Ti*k*Z library `ext.layers`.
- Bugfixes to `ext.calendar-plus`.
- Allow the original `rectangle` timer with `ext.paths.timer`.

Version 0.4.2 (2022-10-30)

- Added Ti*k*Z library `ext.scalepicture`.
- Bugfixes to `shapes.uncenteredrectangle`, `paths.ortho`, `positioning-plus` and `pgfcalender-ext`.

Version 0.4.1 (2022-10-23)

- Cleaned up directory structure of documentary.
- Added PGFkeys library `ext.pgfkeys-plus`.
- Added shape `uncentered rectangle` (PGF library `ext.shapes.uncenteredrectangle`).
- Fixed `ext.paths.arcto` – again [1].

Version 0.4 (2022-10-10)

- CTAN version of 0.3.1

Version 0.3.1 (2022-10-09)

- Fixed `ext.paths.ortho` keys `only vertical first` and `only horizontal first`.
- Moved all (except the `to paths`) to namespace `/tikz/ortho`. `/tikz/hvvh` and `/tikz/udlr` are considered deprecated.
- Fixed `\pgfcalendarjulianyeartoweek`.
- Added more calendar tests.
- Added directory structure.

Version 0.3 (2022-09-24)

- Added shape `circle arrow` (PGF library `ext.shapes.circlearrow`).

- Added shape `circle cross split` (PGF library `ext.shapes.circlecrosssplit`).
- Added shape `heatmark` (PGF library `ext.shapes.heatmark`).
- Added shape `rectangle with rounded corners` (PGF library `ext.shapes.rectangleroundedcorners`).
- Added shape `superellipse` (PGF library `ext.shapes.superellipse`).
- Added Ti*k*Z library `ext.node-families.shapes.geometric`.
- Fixed `ext.node-families`' key `size`.
- Renamed internal macros to use custom namespace starting with `\tikzext@`.
- Added some references.

Version 0.2 (2022-08-21)

- Added Ti*k*Z library `ext.positioning-plus`.
- Added Ti*k*Z library `ext.node-families`.

Version 0.1 (2022-08-16)

- Added Ti*k*Z library `ext.calendar-plus`.
- Added Ti*k*Z library `ext.misc`.
- Added Ti*k*Z library `ext.paths.arcto`.
- Added Ti*k*Z library `ext.paths.ortho`.
- Added Ti*k*Z library `ext.paths.timer`.
- Added Ti*k*Z library `ext.patterns.images`.
- Added Ti*k*Z library `ext.topaths.arcthrough`.
- Added Ti*k*Z library `ext.transformations.mirror`.
- Added PGF library `ext.transformations.mirror`.

Index

This index contains automatically generated entries as well as references to original functionalities of PGF/Ti*k*Z and references to functionalities outside of PGF/Ti*k*Z.

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References

[1] marmotghost. *clockwise/counter clockwise does not seem to work reliably*. Oct. 2022. URL: https://github.com/Qrrbrbirlbel/tikz-extensions/issues/2 (visited on 10/23/2022) (cit. on p. 77).

[2] marmotghost. *Latest version of ext.misc on CTAN appears to have a typo*. Mar. 2023. URL: https://github.com/Qrrbrbirlbel/tikz-extensions/issues/6 (visited on 04/01/2023) (cit. on p. 77).