

# The TikZ-Extensions Package

## Manual for version 0.6 (8)

<https://github.com/Qrrbrbirlbel/tikz-extensions>

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## Part II

# TikZ Libraries

These libraries only work with TikZ.



## 15 Scaling Pictures to a Specific Size

### TikZ Library `ext.scalepicture`

```
\usetikzlibrary{ext.scalepicture} % LATEX and plain TEX
\usetikzlibrary[ext.scalepicture] % ConTEXt
```

This library scales TikZ pictures to a specific width or height by scaling the whole picture.

If one of the keys below are used on a TikZ picture, meaning as an option to `\tikzpicture` or `\begin{tikzpicture}`, the size of the picture<sup>5</sup> will be measured and written to the AUX file so that it will be available at the next compilation run and an appropriate scaling for the picture can be installed.

#### `\tikzextpicturewidth`

Returns the last measured width of the picture.

This will expand to 0pt if the picture hasn't been measured before.

#### `\tikzextpictureheight`

Returns the last measured height of the picture.

This will expand to 0pt if the picture hasn't been measured before.

#### `/tikz/ext/save picture size` (style, no value)

This key is usually used by the keys provided by this library. Normally, this is not needed to be explicitly given.

### 15.1 Externalization

As this library usually needs multiple compilations to produce stable pictures it is incompatible with the external library.

However, the library provides support for the memoize [57] package. When it is used the arguments to the keys below will be saved as the context of the memo. This means that the arguments need to be a valid `\dimexpr` expression.

### 15.2 Keeping the aspect ratio

The following *unstarred* keys do not change the aspect ratio of the picture.

<sup>5</sup>This is the size of the pseudo-node `current bounding box`.

#### `/tikz/ext/picture width=<dimension>` (no default)

Scales the picture so that the width of the picture will be `<dimension>`. This will keep the aspect ratio the same.

#### `/tikz/ext/minimum picture width=<dimension>` (no default)

As above but will not change the size of the picture if its width is greater than `<dimension>`.

#### `/tikz/ext/maximum picture width=<dimension>` (no default)

As above but will not change the size of the picture if its width is less than `<dimension>`.

#### `/tikz/ext/picture height=<dimension>` (no default)

Scales the picture so that the height of the picture will be `<dimension>`. This will keep the aspect ratio the same.

#### `/tikz/ext/minimum picture height=<dimension>` (no default)

As above but will not change the size of the picture if its height is greater than `<dimension>`.

#### `/tikz/ext/maximum picture height=<dimension>` (no default)

As above but will not change the size of the picture if its height is less than `<dimension>`.

#### `/tikz/ext/minimum picture size={<width>}{<height>}` (no default)

Scales the picture so that its width will be at least `<width>` and its height will be at least `<height>`.

#### `/tikz/ext/maximum picture size={<width>}{<height>}` (no default)

Scales the picture so that its width will be at most `<width>` and its height will be at most `<height>`.

### 15.3 Changing the aspect ratio.

The following *starred* keys do change the aspect ratio.

`/tikz/ext/picture width*= $\langle dimension \rangle$`  (no default)

Scales the picture so that the width of the picture will be  $\langle dimension \rangle$ . This will only scale the  $x$  axis.

`/tikz/ext/minimum picture width*= $\langle dimension \rangle$`  (no default)

As above but will not change the size of the picture if its width is greater than  $\langle dimension \rangle$ .

`/tikz/ext/maximum picture width*= $\langle dimension \rangle$`  (no default)

As above but will not change the size of the picture if its width is less than  $\langle dimension \rangle$ .

`/tikz/ext/picture height*= $\langle dimension \rangle$`  (no default)

Scales the picture so that the height of the picture will be  $\langle dimension \rangle$ . This will only scale the  $y$  axis.

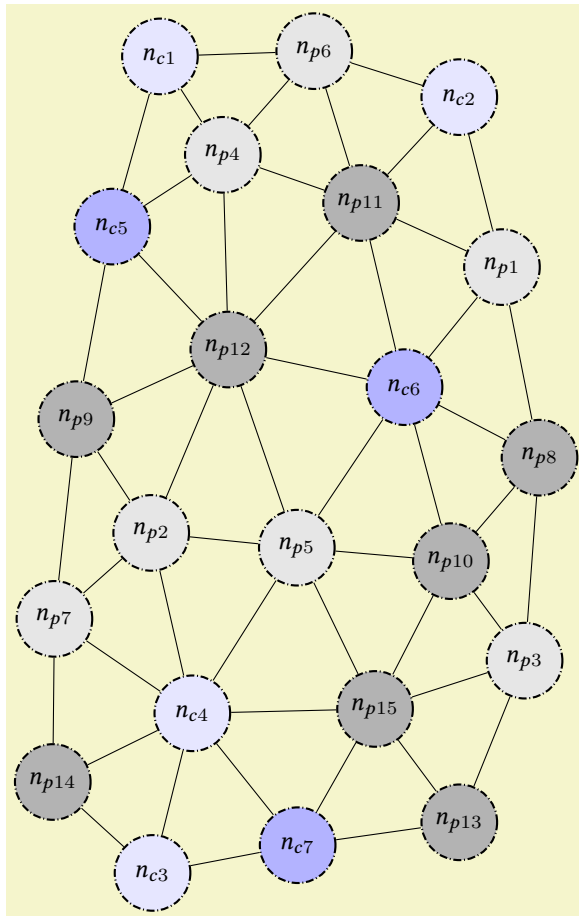
`/tikz/ext/picture size*={ $\langle width \rangle$ }{ $\langle height \rangle$ }` (no default)

Scales the picture so that its width will be  $\langle width \rangle$  and its height will be  $\langle height \rangle$ . This will scale both axes but independent from each other.

## Part III

# PGF Libraries

These libraries (should) work with both PGF and TikZ.

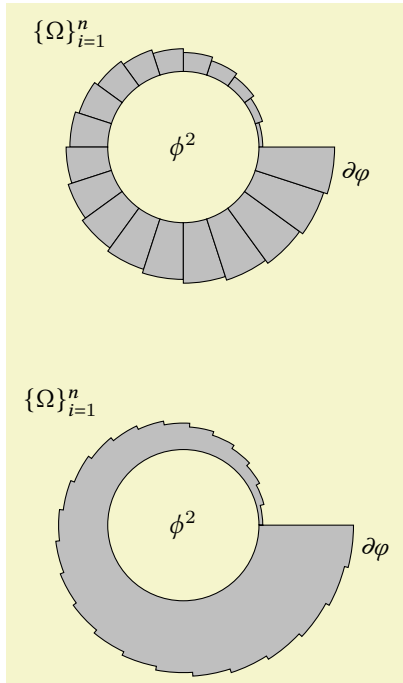


```
\usetikzlibrary {graphs,graphdrawing,ext.misc} \usegdlibrary {force}
\tikzset{
  mynode/.style={
    circle, minimum size=10mm, draw, densely dashdotted, thick,
    decide color/.expand once=#1,
    decide color/.style 2 args={
      /utils/TeX/if=c#1
      {/utils/TeX/ifnum={#2<5}{blue!light}{blue!dark}}
      {/utils/TeX/ifnum={#2<8}{light}{dark}}},
    light/.style={fill=gray!20}, blue!light/.style={fill=blue!10},
    dark/.style={fill=gray!60}, blue!dark/.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=+IR] -- (\iN R+1R:smallR)
  arc [radius=smallR, end angle=\iN R, delta angle=-IR] -- 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=IR]}
    -- (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 TikZ library `ext.arrows-plus`.
- Added TikZ 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`. [\[21\]](#)

### Version 0.5 (2023-03-17)

- Added package `pgffor-ext`.
- Added TikZ library `ext.nodes`.
- Added TikZ 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 TikZ library `ext.scalepicture`.
- Bugfixes to `shapes.uncenteredrectangle`, `paths.ortho`, `positioning-plus` and `pgfcalendar-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 [\[20\]](#).

### 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 TikZ 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 TikZ library `ext.positioning-plus`.

- Added TikZ library `ext.node-families`.

#### Version 0.1 (2022-08-16)

- Added TikZ library `ext.calendar-plus`.
- Added TikZ library `ext.misc`.
- Added TikZ library `ext.paths.arcto`.
- Added TikZ library `ext.paths.ortho`.
- Added TikZ library `ext.paths.timer`.
- Added TikZ library `ext.patterns.images`.
- Added TikZ library `ext.topaths.arctthrough`.
- Added TikZ 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/TikZ and [references](#) to functionalities outside of PGF/TikZ.

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