## The tikzposter class $^{\ast}$

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#### Abstract

This document class aims to provide a simple way of using TikZ for generating posters.

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<sup>\*</sup>This document corresponds to tikzposter v2.0, dated 2013/04/09.

#### 1 Introduction

The tikzposter document class file may be used to simplify formatting and generating scientific posters in the .pdf format. It uses the TikZ package to generate a poster layout. The poster is formed by a series of blocks against a background in a sequence of aligned columns. The purpose of the class is reduce the level of formatting by automatically setting spacing between blocks in the poster as well as their lengths. The user has control over the width of the columns. Due to the class' reliance on TikZ, only .pdf output is supported. This document explains the formatting options available and how to easily create a basic block layout.

In order to use the class, begin the document with

#### \documentclass[options]{tikzposter}

where the options are explained in Section 2. After this, title matter may be declared and the color theme information entered (see Section 3. Inside of the document environment, the title is created by the use of one of the title block commands (see Section 4) and columns of aligned blocks are then created (see Section 6).

Required packages: The class uses LATEX2e and the following required packages: tikz, calc, ifthen, ae, xstring, etoolbox, xkeyval.

Changes from previous versions: Significant changes have been made between the current version and the previous version of tikzposter. Aside from bug fixes, there have been the following changes: The background can now be customized, the title formatting is simplified, blocks can be shifted with respect to the default positioning, the format and appearance of blocks can be customized, and a new type of object, the note object was introduced. With the exception of the title matter and calls to the commands settitlebodystyle, setblocktitlestyle, setblockbodystyle, a document that functioned with the previous version will also function with the current version.

## 2 Format options

There are several options available for customizing the general layout of the poster. These are called as optional arguments when declaring the document class. The options for the page geometry are

- font size: The size of the text in the main body may be set as: 12pt, 14pt, 17pt, 20pt, or 25pt.
- paper size: Currently, paper sizes may be set to: aOpaper, a1paper, or a2paper.
- orientation: Either landscape or portrait.

The following options are set in the form  $\langle variable\ name \rangle = \langle value \rangle$  and deal with spacing between blocks and between portions of the blocks:

- margin: The margin between outer edge of the poster and the edge of the paper.
- inner margin: The margin from the edge of the poster edge to the outermost edge of the blocks;
- titleinnersep: The spacing between the edge of the title block and the title and logos inside of the title block;
- titletoblockverticalspace: The spacing between the bottom edge of the title block and the top of columns of blocks below;
- colspace: The horizontal spacing between successive columns;
- subcolspace: The horizontal spacing between successive columns in the subblock environment (See Section 6 for more on this environment).
- blocktitleinnersep: The spacing between the edge of the blocks' title frames and the blocks' title text;
- blocktitlewidthratio: The relative width of the title in relation to the block body's width;
- blocktitlemaxwidth: The maximum width of the lines in a block's title;
- blockbodyinnersep: The inner margin for the contents of the blocks;
- blockverticalspace: The spacing between the bottom of a normal block and the top of the next block;
- noteinnersep: The spacing in a note object between the edge of a note and its contents.

A sample usage of these options would be:

\documentclass[25pt, a0paper, portrait, margin=0mm, innermargin=15mm, titleinnersep=8mm,titletoblockverticalspace=20mm,blocktitleinnersep=8mm, blocktitlewidthratio=08, blocktitlemaxwidth=25cm ,blockbodyinnersep=8mm, blockverticalspace=15mm,colspace=15mm, subcolspace=8mm,noteinnersep=3mm] {tikzposter}

These listed values are in fact the default values of the optional arguments.

Additional formatting options for title shapes, block shapes, note shapes, and the background are allowed and are described in the relevant sections. To turn off the comment on how the poster was created in the lower right corner, include in the preamble \tikzposterlatexaffectionproofoff.

#### 2.1 Themes

\usetheme

In the remaining sections, various components of the poster are described as well as how to choose "styles" which define the appearance of these components. In tikzposterThemes.tex, themes are defined. These themes may include redefining the above format options, selecting the appearance of the title matter, blocks, notes, background, and color scheme as described below. The themes act as a means to define a template. It is called by the command \usetheme{}} where the argument is either the name of a theme in tikzposterThemes.tex or the name of a .tex file where the theme is defined. A sample theme called sample may be defined with the following

```
\def\TP@themesample{
  \usecolortheme{sample}
  \usebackground{sample}
  \usetitlestyle{Test}
  \useblockstyle{sample}
  \usenotestyle{TestNote}
}
```

It should be noted that if other commands such as \usecolortheme are included in the preamble, the choice for the theme overrides these commands. Predefined themes are TO BE FILLED TO BE FILLED TO BE FILLED

#### 3 Setting the color theme

\usecolortheme

In the preamble, the color theme may be set via \usecolortheme{theme}. If no theme is chosen, a default color theme with gray background and blue block titles is used. The theme input may be on the following preset themes: default, anil, armin, edgar, emre, hanna, james, kai, lena, manuel, martin, max, nicolas, pascal, peter, philipp, richard, roman, stefanie, vinay (named for MathC-CES institute members, several of whom helped create the themes). Alternatively, you may use your own theme. In this case, the input theme is the name of the .tex file (without extension) where this has been created. The referenced file should be simply a sequence of \definecolor calls where the colors described below are defined. Alternatively, the new theme may be insert into the included file tikzposterColorthemes.tex. Note: If the styles for the various components (blocks, notes, background) are altered, those will override the following definitions. The remainder of this section is dedicated to the required elements in a theme. We note that if a color in the theme is undefined, default colors will be used. Finally, if one wishes, one may define in the document file the colors locally in the preamble. This is done via the standard \definecolor command and should reference colors named below.

background colors

The background has associated with it the colors background color and framecolor which are, respectively, the color for the solid background and the color for the outer edges of the poster and the outer edges for all blocks.

The text of the title material of the poster is in the color titlefgcolor.

block colors

The colors for the backgrounds of the blocks can also be defined. The background color of the title portion of the block may be set with blocktitlebgcolor and the background color of the portion of the block with the text is set by blockbodybgcolor. The note blocks created have background color defined by notebgcolor.

text colors

note colors

The relevant text colors may also be individually defined. The color of the text of the title matter is defined via titlefgcolor. The color of the title text in each block is defined by blocktitlefgcolor and the color of the text of the main portion of the block is defined by blockbodyfgcolor. Finally, the notes' text uses the color notefgcolor. The contents of a sample colortheme.tex are included below.

% Background Colors
\definecolor{backgroundcolor}{HTML}{EEEEEE}
\definecolor{framecolor}{named}{black}
% Title Colors
\definecolor{titlefgcolor}{named}{black}
% Block Colors
\definecolor{blocktitlebgcolor}{HTML}{0066A8}
\definecolor{blockbodybgcolor}{named}{white}
\definecolor{blocktitlefgcolor}{named}{white}
\definecolor{blockbodyfgcolor}{named}{black}
% Note colors
\definecolor{notefgcolor}{named}{black}
\definecolor{notefgcolor}{famed}{black}
\definecolor{notefgcolor}{famed}{black}
\definecolor{notebgcolor}{famed}{fomecolor}{fomecolor{forebgcolor}{famed}{fomecolor}{fom

## 4 Setting the title matter

\maketitle

In the preamble, the standard fields *title*, *author* and *institute* may be defined. Additionally, a graphic may be included by setting \titlegraphic. The title is then created with the normal \maketitle command. The necessary spacing is handled using the options chosen in the call to the document class described in Section 2. The default format for the title is seen in Figure 1. There are also two optional commands for deciding the appearance of the title matter. One can redefine the way the title matter (title, author, etc.) are arranged, and the appearance of the "block" surrounding this matter. These are done by \settitle and \usetitlestyle which are described below. The user can change this format



Figure 1: Default format of the title material

\settitle

by including in the preamble \settitle. Note that when referring to the title, author, titlegraphic, and institute with this command, one needs to use \@title, etc. A sample alternative title format is:

```
\settitle{ \vbox{ \centering \color{titlefgcolor} \huge \@title
\\ --- \@author~-- \\ @institute \\[1em] \@titlegraphic } }
```

\usetitlestyle

If the default simple box surrounding the title matter is not desired, the user may use one of the several predefined title styles by using in the preamble \usetitlestyle{} where the argument is a style listed in tikzposterTitlestyles.tex or the name of a .tex file with TikZ commands. These are TO BE FILLED TO BE FILLED TO BE FILLED. A sample title style file called ugly would contain

```
\draw[color=green,fill=yellow] (title.south west) rectangle (title.north east);
\draw[fill=blockbodybgcolor!60]($(title.south west)+(3cm,.1cm)$) circle(4cm);
\draw[thick,red,->](title.south east) --(title.north west);
```

and could be called using \usetitlestyle{ugly}.

#### 5 Setting the Background

The background is by default a single color depending on the value of backgroundcolor set by the color theme chosen (see Section 3). If the user wishes to alter this, then in the preamble, one of two options may be employed.

\setbackground \usebackground

• \setbackground{}: This command takes as argument valid TikZ commands; an example usage of this is:

```
\setbackground{
\draw[inner sep=0pt, line width=0pt, color=red, fill=green]
(-0.5\textwidth, -0.5\textheight) rectangle (0.5\textwidth, 0.5\textheight);}
```

• \usebackground{}: This command takes as argument either a name for a setting in the file tikzBackgrounds.tex, included with the package TO BE FILLED TO BE FILLED or the name of a .tex file (without including the extension) which contains the relevant TikZ commands. A sample usage would be

\usebackground{mybackground}

```
where mybackground.tex contains
```

```
\draw[inner sep=0pt, line width=0pt, color=framecolor, fill=backgroundcolor] (-0.5\textwidth, -0.5\textheight) rectangle (0.5\textwidth, 0.5\textheight);
```

In either case, it is important to note that the point (0,0) is the center of the poster (after removing the margins). Additionally, as can be seen from the example commands above, the user has access to several variables. These include:

- \textwidth: The total width of the available poster space, after creating the margins.
- \textheight: The total height of the available poster space, after creating the margins.
- framecolor: Defined in color theme or by user in preamble (see below).
- backgroundcolor: Defined in color theme or by user in preamble (see below).

#### 6 Creating blocks and notes

\block

The poster is composed primarily of blocks with or without titles. Blocks are created with the command \block[options] {title} {text}. Excluding options, this creates a block of the width of the width of the page, excepting the margin and inner margin. A title for the block will be generated along the top in a separate, smaller block, centered using the contents of title. The width of the block may optionally be set (i.e. width=0.75\textwidth); else it will be set to be the \textwidth or, if in a column (see below), to the \colwidth; alternatively, it may be set with an absolute width (i.e. width=8cm). If the title field is left empty, then there will be no title for the block created. Multiline titles are supported and will be (approximately) broken to satisfy the maximum width of the block titles as specified in the formatting options described above. Additionally, the block's title may be aligned via one of the following inputs in the option titleleft, titleright which sets the title as aligned (subject to the specified spacing rules) as left or right justification, respectively; without specifying the alignment, the title will be centered. The contents of text will be displayed in the main body of the block. The length of the block is determined automatically by the contents of text. Further blocks may be generated in the same column by further uses of \block. However, if the contents of the blocks in a single column lead to spill over (that is, they take up more vertical space than allowed under the formatting for the paper size and margins), then formatting errors will occur.

titleoffsetx titleoffsety bodyoffsetx bodyoffsety If the user wishes, the block may be placed in violation of the automatic alignment according to the column rule, or spacing rules. This may be achieved with 4 options. The first two, titleoffsetx and titleoffsety, are used to shift the title block from the default position. The latter two, bodyoffsetx and bodyoffsety, shift the main content block (containing text) from its default position. All four are by default set to 0. That is, in relation to previously created blocks, the class determines the position of the current block according to the format options' spacing values and then determines the appropriate heights of the two components, main part and title. The position can then be adjusted as desired. A sample block may be created by the command

\block[titleleft,titleoffsetx=2em,titleoffsety=1em,bodyoffsetx=2em,bodyoffsety=1em,width=.8\textwidth]{Sample Block}{Test\\Test\\Test}

We note that invoking the offset options may lead to blocks being obscured; the class avoids this by default but does not readjust other blocks when these are used.

\useblockstyle \setblockstyle If the user wishes to use blocks with a different style, the commands \useblockstyle{style} and \setblockstyle{commands} are available. The first loads either prewritten styles available in tikzposterBlockstyles.tex. These are TO BE FILLED TO BE FILLED TO BE FILLED. If style does not match one of these styles, it is understood to be the name of a file style.tex which contains the relevant commands to define a style of block. The user can also place, in the preamble or—if to be used after a certain point in the document, inside the document—the command \setblockstyle{commands} which contains a definition for drawing a block and (if wanted) the title. A sample invocation of this might be

The block will then draw the objects as defined by \setblockstyle and afterwards put the contents in those positions. As can be seen, when creating the style, the user has access to several parameters. They are computed after the class determines, under the rules of formatting and given the width of the block, dimensions of the These include, aside from the already mentioned, include

- \ifBlockhasTitle: a boolean for whether the block has nonempty first argument;
- blocktitle: a TikZ node defining the appropriate position of the title subject to the spacing rules and the length/width of the title;
- blockbody: a TikZ node defining the appropriate position of the body subject to the spacing rules and the length/width of the body and title(assuming the title is above the body);
- \blockwidth: the width of the body either according to the width of the poster, the column the block is in, or the width defined in the options;
- \blocktitleheight: The height of the block's title matter;
- \blockbodyheight: The height of the block's body contents;
- framecolor, blocktitlebgcolor, blockbodybgcolor, blocktitlefgcolor, and blockbodyfgcolor: determined by the chosen color theme.

\note Additionally, small notes may be added with the use of the \note[options] {contents} command. Notes are smaller blocks which are associated with blocks. They can be used to attach comments to specific points in the blocks. The available parameters that can be optionally set are:

- targetoffsetx,targetoffsety: the note places a "target" point in the center of the previously created block and uses this as a reference point for placement. If this target should be moved, these two parameters can be set to shift the target away from the default;
- angle,radius: after the target has been set, the center of the note is a distance of radius away from the target with angle (with respect to the horizontal axis) angle;
- width: the desired width of the note;
- connection: If the note style allows for it (see below on the style), using the connection option draws the relevant connection (i.e. line or arrow) from the note's center point to the target point;
- rotate: If the entire note should be rotated, a rotation angle (again with respect to the horizontal axis) may be defined using this option.

A sample note could be constructed via:

\note[targetoffsetx=2cm, targetoffsety=-1cm, angle=90, radius=3cm,
width=5cm, rotate=30, connection]{Text}

This inserts a note which is directly above (angle=90) and 3 cm from the target, which is 2 cm to the right of and 1 cm below the block center, and is then rotated 30 degrees. A connection is then drawn from the block center to this target. Two comments should be kept in mind. First, notes are always visible over the background and blocks. Second, like in the case above regarding offset blocks, placed notes may block each other, as there is no automatic spacing rules. Thus care must be made in placing them to ensure the proper appearance. If one wishes, alternative note appearances may be used. If the user wants to use one of the included note styles TO BE FILLED TO BE FILLED, the command \useblockstyle{style} may be employed. This will first look for a style in the file tikzposterNotesstyle.tex corresponding to style; if one is not found there, the class assumes there is a file named style.tex (again noting that the command does not include the extension) with the appropriate commands. Alternatively, one may include in either the preamble or inside of the document the command \setnotestyle{commands} which defines the method of drawing a note. In either the style file or the use of \setnotestyle, the user may make use of the following parameters:

\usenotestyle \setnotestyle

- \ifNoteHasConnection: a boolean denoting whether connection has been included as an option;
- notetarget: a TikZ node defining the placement of the note target;

- notecenter: a TikZ node defining the placement of the center of the note;
- \noterotate: the angle the entire note should be rotated;
- \notewidth: the defined width of the note;
- \noteheight: the calculated height of the note;
- framecolor, notefgcolor, notebgcolor: colors defined in the color them (see below).

An example style may be defined via the command:

```
\setnotestyle{
\ifNoteHasConnection
\draw[thick] (notecenter) -- (notetarget) node{};
\fi
\draw[draw=red,fill=green,rotate=\noterotate] (notecenter.south west)
rectangle (notecenter.north east);
}
```

#### 7 Columns

columns

If multicolumn formats are desired, the environment columns may be used. All blocks generated inside of this environment will be divided into the desired columns with the specified width. This can be To begin a column, use the command \column{width}. Any blocks created after this will be aligned along a vertical line automatically placed, depending on the number of columns and their widths, as specified inside of the instance of the environment. Formatting errors may arise if the sum of the column widths is greater than 1. Alternatively, the width may also be set absolutely (i.e. width=20cm). The width of the column may be referred—for formatting pictures or altering a block's width, for instance—by referencing the length \colwidth.

subcolumns

If you wish to create a set of subcolumns in the current column, the environment subcolumns can be used. In this environment, subcolumns are created by \subcolumn{width} and blocks are created by \block{title}{text}. However, the width in the \subcolumn command is relative now to the current \colwidth and can be referenced by the length \subcolwidth. The same comments on formatting made above regarding widths and text length hold here as well.

Due to current implementation of the blocks, the figure environment is not possible. Images may be included by the use of \includegraphics and captions are possible by the use of other packages, such at \caption. Currently this produces some warnings which shall be addressed in future releases.

## 8 Poster template

The following LATEX document is intended to be used as a template. It has a minimal set of inputs. Included with the package is an additional

tikzposter-example.tex which has more extensive comments additional options implemented, see Section 9.

```
1 \langle *tikzposter-template.tex \rangle
2 \documentclass{tikzposter}
4 % Title, Author, Institute
5 \title{Template Poster}
6 \author{Author(s)}
7 \institute{Institute}
8 \titlegraphics[\nicludegraphics[height=8cm]{logoL} \hfill \includegraphics[height=8cm]{logoR}}
10
11 % -----
12 % BACKGROUND SETTINGS
13 \usebackground{default}
15 \setbackground{
16 \draw[inner sep=0pt, line width=0pt, color=red, fill=green] (-0.5\textwidth, -0.5\textheight) r
17 }
18
19 \usebackground{Test}
20
21
22 % -----
23 % TITLE SETTINGS
24 \settitle{ \vbox{ \centering \color{titlefgcolor} \huge \Ctitle \\ --- \Cauthor~--- \\ \Cinst
25
26
27 % -----
28 % BLOCK STYLE SETTINGS
29 \useblockstyle{default}
31 %\setblockstyle{
32 % % Draw body
33 % \draw[color=framecolor, fill=red!10] (blockbody.south west) rectangle (blockbody.north east);
34 % % Draw title
35 % \ifBlockHasTitle
36 % \draw[color=framecolor, fill=green!50] (blocktitle.south west) rectangle (blocktitle.north ea
38 % \draw[red, thick] (blocktitle.north west) circle (1em);
39 %}
40 %
41 \useblockstyle{Test}
42
43
45 % -----
46 % NOTE STYLE SETTINGS
47 \usenotestyle{default}
```

```
48 \strut = 18
49 % Draw Connection
50 \ifNoteHasConnection
51 \draw[thick] (notecenter) -- (notetarget) node{};
52 \fi
53 % Draw Note
54 \draw[draw=red,fill=green,rotate=\noterotate] (notecenter.south west) rectangle (notecenter.nor
56 \usenotestyle{TestNote}
57
58
59 % -----
61
62
63 % Begin document
64 \begin{document}
66 % Title block
67 \maketitle
69 %\titleblock[left fig=logoL.png, left fig height=7cm, embedded=true, separated=false]
70 \block{Sample Block}{Test}
71 \begin{columns}
72 % Set first column
73 \column{0.52}
75 % First column - first block
76 \verb|\block[titleleft,titleoffsetx=2em,titleoffsety=1em,bodyoffsety=2em,bodyoffsety=1em,width=.8\\| column{2}|
77 \note{Text1}
78 \note[targetoffsetx=2cm, targetoffsety=-1cm, angle=90, radius=3cm, width=5cm, rotate=30, connec
79 \note[targetoffsetx=12cm, targetoffsety=-1cm]{Text1}
81 % First column - second block
82 \block{Sample Block}{Test\\Test}
84 % First column - third block
85 \block{Sample Block}{
86 T\\E\\S\\T
87 }
89 % Set second column
90 \column{0.48}
92 % Second column - first block
93 \block[titleleft]{Sample Block}{Test}
95 % Second column - second block
96 \block[width=0.85\colwidth,titleright]{Variable width}{
```

97 Block with smaller width.

```
98 }
 99
100 % Second column - third block
101 \block{}{
       Block with no title
102
103 }
104
105 % Second column - subblocks
106 \begin{subcolumns}
       \subcolumn{0.3} \block{1}{First block.} \block{2}{Second block}
107
       \subcolumn{0.5} \block{Subblocks}{Sample subblocks}
108
       \subcolumn{0.2} \block{4}{Fourth}
109
111 \end{subcolumns}
112
113 % Bottomblock
114 \block{Bottomblock}{
       Sample block.
115
116 }
117 \end{columns}
118 \block{Final Block}{Test}
119 \end{document}
121 (/tikzposter-template.tex)
```

## 9 Poster example

Attached is an example tex file tikzposter-example.tex.

## 10 Appendix

#### 10.1 Available variables

If one wishes to create their own themes/styles/etc, the following variables which govern positioning and spacing may be of use. They may be used within themes, title tyles, block styles, and note styles. Please note that each of these are defined and then passed to the style, so they may be referenced and redefined inside of a style. However, not all are local to that block; only those that are noted as being redefined.

- \TP@visibletextwidth,\TP@visibletextheight: the width and height of the poster material. Excludes the margin length set in the option.
- \TP@titleinnersep, \TP@titletoblockverticalspace: defined in options of the document. May be redefined in a theme.
- \TP@titlewidth, \TP@titleheight: width and height of the title block

- \TP@colspace, \TP@coltop, \TP@colbottom, \TP@colcenter, \TP@colwidth: the space between columns, defined in the options, the y-coordinate of the current column's beginning, end, center axis, and absolute width, respectively.
- \TP@subcolspace, \TP@subcoltop, \TP@subcolbottom, \TP@subcolcenter, \subcolwidth: the same lengths, in the subcolumn environment.
- \TP@blockverticalspace,\TP@blocktitleinnersep.\TP@blockbodyinnersep: spacing rules for blocks, defined in options.
- \TP@blockcenter: Horizontal position of the center of the current block; it is redefined for each call to the \block command.
- \blockwidth, \blockbodyheight, \blocktitleheight: dimensions of the current block's components; it is redefined for each call to the \block command.
- \TP@blocktop: The y-coordinate of the top edge of the block (including the title if it exists).
- \TP@blocktitleoffsetx, \TP@blocktitleoffsety: shifts to the position of the block title component; each call to \block resets them to 0.
- \TP@blockbodyoffsetx, \TP@blockbodyoffsety: Similar to the above, but for the block's body component; also reset to 0 with each \block call.
- \TP@noteinnersep: defined in the options
- \TP@noteradius, \TP@notetargetoffsetx, \TP@notetargetoffsety, \notewidth: arguments optionally passed from the \note command; redefined for each call to \note.
- \noteheight: the height of the current note computed according to size of contents and \notewidth; redefine with each call to \note.

Additionally, several nodes are defined for the title and the blocks. These should be used when defining block styles and title styles. The title node is the main node for the title material which spans an area large enough to cover the entirety of the title material as formatted with the \settitle command. For blocks, blocktitle and blockbody are nodes which cover the extent of the relevant components.