A style option for rotated objects in \LaTeX

Leonor Barroca

printed today

Contents

1 History 1
2 Usage 2
3 Setup 2
4 Turning and rotation environments 3
5 Sideways figures and tables 3
   5.1 Rotated captions only ....................................... 6

List of Figures

List of Tables

Abstract

This article documents a \LaTeX package, ‘rotating.sty’, which perform all
the different sorts of rotation one might like, including complete figures.

1 History

Version 2.0 is a complete re-write, with most of the work now being done by the
\LaTeX \texttt{2e} graphics package.
   Version 2.1 provides a ‘clockwise’ option to reinstate the behaviour described
   in the ‘\LaTeX Companion’
   Version 2.2 just intercepts the standard float macros instead of copying and
   changing the. The ‘twoside’ option is obeyed.
   Version 2.5 corrects problems in sideways figures.
   Version 2.6 is a rewrite of the sideways floats via Frank Mittelbach (to whom
   many thanks for lookingat the mangy code).
   Version 2.7 is checked for \LaTeX of December 94, and adds the option of twoside
   behaviour independent of the general twoside.
   Version 2.8 cleans up some mistakes pointed out by Harald Axel Sommerfeldt.
   Version 2.9 cleans up some (more) mistakes pointed out by Harald Axel Sommer-
  feldt.
2 Usage

This style option provides three \LaTeX environments:

\textbf{sideways} prints the contents turned through 90 degrees counterclockwise
\textbf{turn} prints the contents turned through an arbitrary angle
\textbf{rotate} prints the contents turned through an arbitrary angle but does not leave any space for the result

A full set of examples are given in the file \texttt{examples.tex} Now we present the documented code.

3 Setup

\begin{verbatim}
\ProvidesPackage{rotating}[\RInfo\space Rotation package]
\NeedsTeXFormat{LaTeX2e}
\newif\ifrot@twoside
\DeclareOption{clockwise}{% this is for compatibility
 \AtBeginDocument{\setkeys{Grot}{units=360}}%}
\DeclareOption{counterclockwise}{%
 \AtBeginDocument{\setkeys{Grot}{units=-360}}%}
\DeclareOption*{\PassOptionsToPackage{\CurrentOption}{graphics}}
\ExecuteOptions{clockwise}
\if@twoside
 \rot@twosidetrue
\else
 \rot@twosidefalse
\fi
\def\rot@LR{-1}
\ProcessOptions
\RequirePackage{graphicx}
\RequirePackage{ifthen}
\def\rotdriver#1{\makeatletter\input{#1.def}\makeatother}
\end{verbatim}

Sideways figures and tables always take up the whole page. They can be rotated so that the bottom of the figures is on the left or the right; the default is to always turn to the right. If the ‘twoside’ option has been given to the main document class, this package then starts rotating sideways figures according to the page number (this requires two passes through \LaTeX at least). If you want the ‘twoside’ option, but want the figures always in one direction, use the ‘figuresright’ or ‘figuresleft’ options to ‘rotating’.

\begin{verbatim}
\DeclareOption{figuresleft}{%\@rot@twosidefalse
 \def\rot@LR{0}%
 \}
\DeclareOption{figuresright}{%\@rot@twosidefalse
 \def\rot@LR{-1}%
 \}
\DeclareOption*{\PassOptionsToPackage{\CurrentOption}{graphics}}
\ExecuteOptions{clockwise}
\if@twoside
 \rot@twosidetrue
\else
 \rot@twosidefalse
\fi
\def\rot@LR{-1}
\ProcessOptions
\RequirePackage{graphicx}
\RequirePackage{ifthen}
\def\rotdriver#1{\makeatletter\input{#1.def}\makeatother}
\end{verbatim}
4 Turning and rotation environments

\texttt{sideways} Environment to turn the contents through 90 degrees.

\begin{verbatim}
\newcounter{r@tfl@t}
\setcounter{r@tfl@t}{0}
\def\sideways{\Grot@setangle{90}\setbox\z@\hbox{bgroup}\ignorespaces}
\def\endsideways{\unskip\egroup\Grot@x\z@\Grot@y\z@\Grot@box}
\end{verbatim}

\texttt{turn} Rotate the contents of the environment, leaving the appropriate space

\begin{verbatim}
\def\turn#1{\Grot@setangle{#1}\setbox\z@\hbox{bgroup}\ignorespaces}
\def\endturn{\unskip\egroup\Grot@x\z@\Grot@y\z@\wd0\z@\dp0\z@\ht0\z@\Grot@box}
\end{verbatim}

\texttt{rotate} Rotate the contents of the environment, leaving no space.

\begin{verbatim}
\def\rotate#1{\Grot@setangle{#1}\setbox\z@\hbox{bgroup}\ignorespaces}
\def\endrotate{\unskip\egroup\Grot@x\z@\Grot@y\z@\wd0\z@\dp0\z@\ht0\z@\Grot@box}
\end{verbatim}

\texttt{\turnbox} A macro version of the ‘rotate’ environment.

\begin{verbatim}
\def\turnbox#1#2{\Grot@setangle{#1}\setbox\z@\hbox{{#2}}\Grot@x\z@\Grot@y\z@\wd0\z@\dp0\z@\ht0\z@\Grot@box}
\end{verbatim}

5 Sideways figures and tables

Now for the macros to provide a complete environment for sideways figures and tables. We define two environments \texttt{sidewaysfigure} and \texttt{sidewaystable} that fit
in with the normal table and figure floats. These are ‘fixed’ environments that just do 90 degree rotation, but it would be easy to parameterize this to do other rotations if needed (the mind boggles...)

First a generalised ‘rotfloat’ environment. We need to intercept \TeX’s float macros, in order to change the assumed width of a float being \columnwidth. We want it to work on a width of \textwidth so that when we rotate the float, it comes out the right height. This is not actually very satisfactory, since what we really want is for rotated floats to occupy the space they actually use. The captions are a problem — since they can precede the figure or table, we cannot set them in a box of the right width (ie the height of the forthcoming object), because it has not happened yet. The result of these difficulties is that rotated figures always end up as full page figures.

```
68 \newsavebox\rot@float@box
69 \def\rotfloat#1{%
70 \ifnextchar[{
71 \xrotfloat{#1}%
72 \edef\@tempa\noexpand\xrotfloat{#1}[\csname fps@#1\endcsname]@\tempa%
73 }
74 \xrotfloat[#2]{%
75 \if@twoside%
76 \begin{lrbox}\rot@float@box
77 \begin{minipage}\textwidth
78 }
79 \end@rotfloat{%
80 \end{minipage}\end{lrbox}%
81 \gdef\rotlabel{RF\ther@tfl@t}%
82 \setkeys{Grot}{units=360}%
83 \if@twoside%
84 \else%
85 \let\rot\rotLR%
86 \fi%
87 \ifthenelse{\isodd{\rot@page}}{%
88 \message{right hand page}%
89 \else%
90 \message{Adding sideways figure on }%
91 \let\rot\rotLR%
92 \fi%
93 \message{Adding sideways figure on }%
94 \begin{lrbox}\rot@float@box
95 \begin{minipage}\textwidth
96 }
97 \begin{minipage}\textwidth
98 }
99 \end{lrbox}%
100 \global\addtocounter{r@tfl@t}{1}%
101 \setkeys{Grot}{units=360}%
102 \if@twoside%
103 \else%
104 \let\rot\rotLR%
105 \fi%
106 \ifthenelse{\isodd{\rot@page}}{%
107 \message{right hand page}%
108 \else%
109 \message{Adding sideways figure on }%
110 \let\rot\rotLR%
111 \fi%
```

Set the float contents in a box of \textwidth instead of \columnwidth.

```
We call the \end@float macro having previously rotated the box \@currbox The rotation is either clockwise or anti-clockwise, depending on whether the page is odd or even; in oneside mode it is always odd.
```

```
If we are going to know whether pages are odd or even, we need to use the a variant \pageref mechanism, and labels. But Labels won’t work unless the user has put in a caption. Beware!
```

```
We need to know for sure which direction rotation is going to be in, so locally reset the graphics units.
```

```
We need to know for sure which direction rotation is going to be in, so locally reset the graphics units.
```

```
```
The following definitions set up two environments, \texttt{sidewaystable} and \texttt{sidewaysfigure}, which uses this type of float. Naturally, users may need to change these to suit their local style. Both contribute to the normal lists of figures and tables.

\begin{verbatim}
\def\sidewaysfigure{\@rotfloat{figure}}% 107\let\endsidewaysfigure\end@rotfloat 108\def\sidewaystable{\@rotfloat{table}}% 109\let\endsidewaystable\end@rotfloat

Handling double column float\n\def\@rotdblfloat{% 111\if@twocolumn\let\reserved@a\@rotdbflt\else\let\reserved@a\@rotfloat\fi 112\reserved@a}
\def\@rotdbflt#1{\@ifnextchar[{{\@rotxdblfloat{#1}}}{\@rotxdblfloat{#1}[tp]}}
\def\@rotxdblfloat#1[#2]{% 112\hsize\textwidth\linewidth\textwidth 113\@float{#1}[#2]% 114\begin{lrbox}\rot@float@box
115\begin{minipage}\textheight
116} 117\def\end@rotdblfloat{\end{minipage}\end{lrbox} 118\global\addtocounter{r@tfl@t}{1} 119\rot@label{RF\ther@tfl@t} 120\message{Adding sideways figure on }% 121\def\R@@page{\pageref{RF\ther@tfl@t}}% 122\@tempdima\ht\rot@float@box 123\advance\@tempdima by \dp\rot@float@box
124\typeout{BOX wd: \the\wd\rot@float@box, ht: \the\ht\rot@float@box, dp: \the\dp\rot@float@box: so
125\wd\rot@float@box\z@ 126\ht\rot@float@box\z@ 127\dp\rot@float@box\z@ 128\vbox to \textwidth
129\setkeys{Grot}{units=360}% 130\if@rot@twoside
131\ifthenelse{\isodd{\R@@page}}{\message{right hand page} % 132\vfill 133\hbox to\textwidth{\hfill\rotatebox{90}{\box\rot@float@box}\hfill 134\vfill}}{\vfill% 135\hbox to\textwidth{\hfill\rotatebox{-90}{\box\rot@float@box}\hfill}}% 136\vfill
137\vfill
138\vfill
\end{verbatim}
Note that we used \rot@label, not \label; this variant writes the true page number, not the value of \thepage. It also involves a variant \protected@write for reasons which I do not fully understand. Let it stand.

\long\def \r@protected@write#1#2#3{% 
  \begingroup 
  \let\therpage\relax 
  #2% 
  \let\protect\@unexpandable@protect 
  \edef\reserved@a{\write#1{#3}}% 
  \reserved@a 
  \endgroup 
  \if@nobreak\ifvmode\nobreak\fi\fi 
}\def\therpage{\arabic{page}} 
\def\rot@label#1{% 
  \r@protected@write\@auxout{}% {\string\newlabel{#1}{{\@currentlabel}{\therpage}}}% 
}\def\@rotcaption#1[#2]#3{% 
  \addcontentsline{\csname ext@#1\endcsname}{#1}{\ignorespaces #2}% 
  \par 
  \begingroup 
  \@parboxrestore 
  \normalsize
  \@makerothcaption{\csname fnum@#1\endcsname}{#3}% 
  \endgroup 
}

5.1 Rotated captions only

Sometimes you may find that the rotation of complete figures does not give quite the right result, since they always take up the whole page. You may prefer to rotate the caption and the float contents separately within a conventional figure. Here we offer a suggestion for a \rotcaption command, which inserts the caption rotated by 90 degrees. It is essentially a copy of the normal captioning code. Styles which define the \makerothcaption command may also need to define \makerothcaption.

\def\rotcaption{\refstepcounter{\captype}\@dblarg{\rotcaption\@captype}} 
\long\def\rotcaption#1[#2]#3{% 
  \addcontentsline{\csname ext\@captype\endcsname}{\ignorespaces #2}/% 
  \par 
  \begingroup 
  \@parboxrestore 
  \normalsize
  \makerothcaption{\csname fnum@#1\endcsname}{#3}% 
  \endgroup 
}
\long\def\makerotcaption#1#2{%
  \setbox\@tempboxa\hbox{#1: #2}%
  \ifdim \wd\@tempboxa > .8\vsize
    \rotatebox{90}{%
      \begin{minipage}{.8\textwidth}#1: #2\end{minipage}%
    \par
  \else%
    \rotatebox{90}{\box\@tempboxa}%
  \fi
  \hspace{12pt}%
}

}/package\]