

Modern Beamer Presentations with the MTHEME package

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v0.x.x

1 Introduction

Beamer is an awesome way to make presentations with LaTeX. But the stock themes do not necessarily look particularly nice and the custom themes often scream “Beamer” at first sight. The goal of MTHEME is to provide a modern Beamer theme with minimal visual noise. It provides section slides with a neat progress bar and it is intended to be used with [Fira Sans](#), a gorgeous typeface commissioned by Mozilla and designed by [Carrois](#). Hence to get the best results you should have installed the Fira typeface and use XeTeX to typeset your slides. Nevertheless this is no hard dependency. The theme also works fine with pdfTeX and the Computer Modern typeface.

The codebase is maintained on [GitHub](#). So if you have issues, find mistakes in the manual or want to contribute – to make the theme even better – get in touch there.

2 Getting Started

2.1 Installation

The MTHEME uses Make as build system. Hence the installation is very straightforward. Simply type

```
$ make
$ make install
```

in the top directory and all the files will be created and installed on your computer. The complete list of make rules is as follows:

all

Build the theme, the manual and the demo presentation.

install

Install the theme into your local texmf folder.

uninstall

Remove the theme from your local texmf folder.

sty

Build the manual.

manual

Build the manual.

demo

Build the demo presentation.

ctan

Create a package for CTAN distribution.

2.2 Dependencies

- XeLaTeX
- **Fira Sans** and Mono font
- TikZ

Depending on the Linux distribution, the packaged name of **Fira Sans** might be **Fira Sans OT** instead of **Fira Sans**. In that case, you may have to edit `beamerfontthememetropolis.dtx`. You may also need to install Fira Sans; see the `contrib/` directory for more. Users of Debian or Ubuntu can also install this [.deb package](#) containing the theme files as well as the Fira Sans font files.

2.3 Pandoc

To use this theme with [Pandoc](#)-based presentations, you can run the following command

```
$ pandoc -t beamer --latex-engine=xelatex -V theme:m -o
  output.pdf input.md
```

2.4 A Minimal Example

To get started with the theme is very simple. The following code shows a minimal example of a Beamer presentation using the `MTHEME`.

```
\documentclass[10pt]{beamer}
\usetheme{m}                % load mtheme
\title{A modern beamer theme} % define title
\date{\today}              % define date
\author{Matthias Vogelgesang} % define author
\institute{Institute}      % define institute
\begin{document}
\maketitle                 % create titlepage
\section{First Section}    % create section
\begin{frame}{First Frame} % first frame
  Lorem ipsum dolor sit amet, ...
\end{frame}
\begin{frame}{Second Frame} % second frame
  Lorem ipsum dolor sit amet, ...
\end{frame}
\end{document}
```

3 Customization

3.1 Package options

The theme provides a number of options. To use any of the options below, call them when invoking `MTHEME` in the preamble of the slides, i.e.

`\usetheme[<options>]{m}`

<code>usetitleprogressbar</code>	Adds a thin progress bar similar to the section progress bar underneath each frame title.
<code>protectframetitle</code>	In order to use <code>\cite</code> , <code>\ref</code> and similar commands in a frame title you have to protect the title. This can be done automatically with this option.
<code>blockbg</code>	Adds background color to the blocks similar to other beamer themes.
<code>nooffset</code>	By default, the MTHEME adds <code>\vspace{2em}</code> after the frametitle to center content vertically on the frame. This option removes this additional space in order to get more content per slide.
<code>nosectionslide</code>	By default when using the <code>\section</code> command, a slide is created with just the title and the progress bar on it. This option prevents the creation of these additional slides.
<code>usetotalslideindicator</code>	By default, only the current page number is printed in the lower right corner. This option changes the slide numbering format to <code>#current/#total</code> .
<code>noslidenumbers</code>	Omits slide numbers entirely.
<code>darkcolors</code>	Makes the background dark and the foreground light.

3.2 Color Customization

The included metropolis color theme is used by default, but its colors can be easily changed to suit your tastes. All of the theme's styles are defined in terms of three beamer colors:

- `normal text` (dark fg, light bg)
- `alerted text` (colored fg, should be visible against dark or light)
- `example text` (colored fg, should be visible against dark or light)

An easy way to customize the theme is to redefine these colors using

```
\setbeamercolor{ ... }{ fg= ... , bg= ... }
```

in your preamble. For greater customization, you can redefine any of the other colors in `beamercolorthememetropolis`, including progress bar.

3.3 Title Formatting

The main title, section titles, and frame titles are all formatted according to the custom command `\mthemetitleformat`. By default, this is equivalent to `\scshape` and sets the titles in small capitals, but you can change it in your preamble. For example:

```
% no small capitals
\renewcommand{\mthemetitleformat}{}
% all small capitals
\renewcommand{\mthemetitleformat}{\scshape\MakeLowercase}
% all capitals
\renewcommand{\mthemetitleformat}{\MakeUppercase}
```

Note that `\MakeLowercase` and `\MakeUppercase` can have unexpected behaviour in math mode, are disabled when `protectframetitle` is used, and cause crashes when an unprotected frametitle appears on a slide with `allowframebreaks`.

3.4 Commands

The `\plain{title=[]}{<body>}` command sets a slide in plain dark colors which can be useful to focus attention on a single sentence or image.

3.5 Paul Tol's colors: a `pgfplots` theme

A good presentation uses colors that are

- distinct from each other as much as possible, and
- distinct from black and white,
- under many different lighting and display environments, and
- to color-blind viewers,
- all while matching well together.

In a [technical note](#) for SRON, Paul Tol proposed a palette of colors satisfying these constraints. The sub-package `pgfplotsthemetol` defines palettes for

pgfplots charts based on Tol's work. Use the `mlineplot` key to plot line data and `mbarplot` or horizontal `mbarplot` to plot bar charts.

4 Known Issues

5 License

The theme itself is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](#). This means that if you change the theme and re-distribute it, you must retain the copyright notice header and license it under the same CC-BY-SA license. This does not affect the presentation that you create with the theme.

6 Contributors

For a full list of contributors please visit the [GitHub Repository](#).

7 Implementation

Options

```
1 \newif\if@useTitleProgressBar
2 \@useTitleProgressBarfalse
3 \DeclareOptionBeamer{usetitleprogressbar}{
4   \@useTitleProgressBartrue
5 }
6
7   usetotalslideindicator
8
9 \newif\if@useTotalSlideIndicator
10 \@useTotalSlideIndicatorfalse
11 \DeclareOptionBeamer{usetotalslideindicator}{
12   \@useTotalSlideIndicatortrue
13 }
14
15   noslidenumbers
16
17 \newif\if@noSlideNumbers
18 \@noSlideNumbersfalse
```

```

13 \DeclareOptionBeamer{noslidenumbers}{
14   \@noSlideNumberstrue
15 }

    nosectionslide

16 \newif\if@noSectionSlide
17 \@noSectionSlidefalse
18 \DeclareOptionBeamer{nosectionslide}{
19   \@noSectionSlidetrue
20 }

    protectframetitle

21 \newif\if@protectFrameTitle
22 \@protectFrameTitlefalse
23 \DeclareOptionBeamer{protectframetitle}{
24   \@protectFrameTiteltrue
25 }

    nooffset

26 \newlength{\@mtheme@voffset}
27 \setlength{\@mtheme@voffset}{2em}
28 \DeclareOptionBeamer{nooffset}{
29   \setlength{\@mtheme@voffset}{0em}
30 }

    blockbg

31 \DeclareOptionBeamer{blockbg}{
32   \PassOptionsToPackage{blockbg}{beamercolorthememetropolis}%
33 }

    darkcolors

34 \DeclareOptionBeamer{darkcolors}{
35   \PassOptionsToPackage{darkcolors}{beamercolorthememetropolis}%
36 }

    Unknown option error handling

37 \DeclareOptionBeamer*{
38   \PackageWarning{beamerthemem}{Unknown option '\CurrentOption'}%
39 }
40 \ProcessOptionsBeamer

    mthemetitleformat

```

`\mthemetitleformat`

```
41 \def\mthemetitleformat#1{\scshape #1}

42 \mode<presentation>

    Packages

43 \RequirePackage{etoolbox}
44 \RequirePackage{tikz}
45 \RequirePackage{pgfplots}
46 \RequirePackage{ifxetex,ifluatex}
47 \newif\ifxetexorluatex
48 \ifxetex
49   \xetexorluatextrue
50 \else
51   \ifluatex
52     \xetexorluatextrue
53   \else
54     \xetexorluatexfalse
55   \fi
56 \fi
57 \usetikzlibrary{backgrounds}
58 \usetikzlibrary{calc}
59 \usecolortheme{metropolis}
60 \ifxetexorluatex
61   \usefonttheme{metropolis}
62 \else
63   \PackageWarning{beamerthemem}{You need to compile with XeLaTeX or Lu-
    aLaTeX for the Fira fonts.}
64 \fi
65
66 \AtEndPreamble{%
67   \@ifpackageloaded{pgfplots}{%
68     \RequirePackage{pgfplotsthemetol}
69   }{}
70 }
71
```

Make Titlepage

`\maketitle`

```
72 \def\maketitle{\ifbeamer@inframe\titlepage\else\frame[plain]{\titlepage}\fi}
```


Define Titlepage

`\titlepage`

```
73 \def\titlepage{\usebeamertemplate{title page}}

Set beamer title page template

74 \setbeamertemplate{title page}
75 {
76   \begin{minipage}[b][\paperheight]{\textwidth}
77     \vspace*{\@mtheme@voffset}
78
79     \ifx\inserttitlegraphic\@empty\else
80     {% \inserttitlegraphic is nonempty
81       \vbox to 0pt
82       {% display title graphic without changing the position of other el-
elements
83         \vspace*{2em}
84         \usebeamercolor[fg]{titlegraphic}%
85         \inserttitlegraphic%
86       }%
87       \nointerlineskip%
88     }
89     \fi
90
91     \vfill%
92
93     \ifx\inserttitle\@empty\else
94     {% \inserttitle is nonempty
95       \raggedright%
96       \linespread{1.0}%
97       \usebeamerfont{title}%
98       \usebeamercolor[fg]{title}%
99       \mthemetitleformat{\inserttitle}%
100      \vspace*{0.5em}
101    }}
102    \fi
103
104    \ifx\insertsubtitle\@empty\else
105    {% \insertsubtitle is nonempty
106      \usebeamerfont{subtitle}%
```

```

107     \usebeamercolor[fg]{subtitle}%
108     \insertsubtitle%
109     \vspace*{0.5em}%
110   }}
111 \fi
112
113 \begin{tikzpicture}
114   \usebeamercolor{title separator}
115   \draw[fg] (0, 0) -- (\textwidth, 0);
116 \end{tikzpicture}%
117 \vspace*{1em}%
118
119 \ifx\beamer@shortauthor\@empty\else
120 {% \insertauthor is always nonempty by beamer's definition, so we must
121   % test another macro which is initialized by \author{...}
122   % For details, see http://tex.stackexchange.com/questions/241306/
123   \usebeamerfont{author}%
124   \usebeamercolor[fg]{author}%
125   \insertauthor%
126   \par%
127   \vspace*{0.25em}
128 }}
129 \fi
130
131 \ifx\insertdate\@empty\else
132 {% \insertdate is nonempty
133   \usebeamerfont{date}%
134   \usebeamercolor[fg]{date}%
135   \insertdate%
136   \par%
137 }}
138 \fi
139
140 \ifx\insertinstitute\@empty\else
141 {% \insertinstitute is nonempty
142   \vspace*{3mm}
143   \usebeamerfont{institute}%
144   \usebeamercolor[fg]{institute}%
145   \insertinstitute%
146   \par%

```

```

147   }}
148   \fi
149
150   \vfill
151   \vspace*{\@mtheme@voffset}
152 \end{minipage}
153 }

```

Progressbar

```
154 \RequirePackage{calc}
```

`\inserttotalframenum`

```

155 \def\inserttotalframenum{100} % prevent \progressbar@percent from get-
    ting too big on first compile
156 \newlength{\progressbar@percent}

```

`\progressbar`

```

157 \newcommand{\progressbar}[1]{%
158   \setlength{\progressbar@percent}{%
159     #1 * \ratio{\insertframenum pt}{\inserttotalframenum pt}%
160   }%
161   \begin{tikzpicture}[tight background]
162     \usebeamercolor{progress bar}
163     \draw[bg, fill=bg] (0,0) rectangle (#1, 0.4pt);
164     \draw[fg, fill=fg] (0,0) rectangle (\progressbar@percent, 0.4pt);
165   \end{tikzpicture}%
166 }

```

Commands

`\insertsectionHEAD`

```

167 \newcommand{\insertsectionHEAD}{%
168   \expandafter\insertsectionHEADaux\insertsectionhead}

```

`\insertsectionHEADaux`

```
169 \newcommand{\insertsectionHEADaux}[3]{\mthemetitleformat{#3}}%
```

Create a plain frame with dark background

`\plain`

```
170 \newcommand{\plain}[2][]{%
171   \begin{group
172     \setbeamercolor{background canvas}{use=palette primary,parent=palette pri-
      mary}
173     \begin{frame}{#1}
174       \centering
175       \vfill
176       \vspace{1em}
177       \usebeamercolor[fg]{palette primary}
178       \usebeamerfont{section title}
179       \mthemetitleformat{#2}
180       \vfill
181     \end{frame}
182   \end{group}
183 }
```

Itemize tweaks

```
184 \setlength{\leftmargini}{1em}
185 \setlength{\leftmarginii}{1em}
186 \setlength{\leftmarginiii}{1em}
```

`\itemBullet`

```
187 \newcommand{\itemBullet}{\cdot}

188 \setbeamertemplate{itemize item}{\itemBullet}
189 \setbeamertemplate{itemize subitem}{\itemBullet}
190 \setbeamertemplate{itemize subsubitem}{\itemBullet}
191 \setlength{\parskip}{0.5em}
```

Block environment

```
192
193 \newlength{\leftrightskip}
194 \if@beamer@metropolis@blockbg
195   \setlength{\leftrightskip}{1ex}
196 \else
197   \setlength{\leftrightskip}{0ex}
198 \fi
199 \setbeamertemplate{block begin}{%
200   \vspace*{1ex}
```

```

201 \begin{beamercolorbox}[%
202   ht=2.4ex,
203   dp=1ex,
204   leftskip=\leftrightskip,
205   rightskip=\leftrightskip]{block title}
206   \usebeamerfont*{block title}\insertblocktitle%
207 \end{beamercolorbox}%
208 \vspace*{-1pt}
209 \usebeamerfont{block body}%
210 \begin{beamercolorbox}[%
211   dp=1ex,
212   leftskip=\leftrightskip,
213   rightskip=\leftrightskip,
214   vmode]{block body}%
215 }
216 \setbeamertemplate{block end}{%
217   \end{beamercolorbox}
218   \vspace*{0.2ex}
219 }

    Alerted block environment

220 \setbeamertemplate{block alerted begin}{%
221   \vspace*{1ex}
222   \begin{beamercolorbox}[%
223     ht=2.4ex,
224     dp=1ex,
225     leftskip=\leftrightskip,
226     rightskip=\leftrightskip]{block title alerted}
227     \usebeamerfont*{block title alerted}\insertblocktitle%
228   \end{beamercolorbox}%
229   \vspace*{-1pt}
230   \usebeamerfont{block body alerted}%
231   \begin{beamercolorbox}[%
232     dp=1ex,
233     leftskip=\leftrightskip,
234     rightskip=\leftrightskip,
235     vmode]{block body}%
236   }
237 \setbeamertemplate{block alerted end}{%
238   \end{beamercolorbox}

```

```

239 \vspace*{0.2ex}
240 }

```

Example block environment

```

241 \setbeamertemplate{block example begin}{%
242 \vspace*{1ex}
243 \begin{beamercolorbox}[%
244 ht=2.4ex,
245 dp=1ex,
246 leftskip=\leftrightsskip,
247 rightskip=\leftrightsskip]{block title example}
248 \usebeamerfont*{block title example}\insertblocktitle%
249 \end{beamercolorbox}%
250 \vspace*{-1pt}
251 \usebeamerfont{block body example}%
252 \begin{beamercolorbox}[%
253 dp=1ex,
254 leftskip=\leftrightsskip,
255 rightskip=\leftrightsskip,
256 vmode]{block body}%
257 }
258 \setbeamertemplate{block example end}{%
259 \end{beamercolorbox}
260 \vspace*{0.2ex}
261 }

```

Sections

```

262 \setbeamertemplate{section page}
263 {
264 \vspace{2em}
265 \centering
266 \begin{minipage}{22em}
267 \usebeamercolor[fg]{section title}
268 \usebeamerfont{section title}
269 \insertsectionHEAD\[-1ex]
270 \progressbar{\textwidth}
271 \end{minipage}
272 \par
273 }

```

Insert frame with section title at every section start

```

274 \if@noSectionSlide\else%
275   \AtBeginSection[]
276   {
277     \ifbeamer@inframe
278       \sectionpage
279     \else
280       \frame[plain,c]{\sectionpage}
281     \fi
282   }
283 \fi

    Captions

284 \setbeamertemplate{caption label separator}{: }
285 \setbeamertemplate{caption}[numbered]

    Footline/footnote

286 \usenavigationsymbolstemplate{}
287 \setbeamertemplate{footline}
288 {%
289 \begin{beamercolorbox}[wd=\textwidth,ht=3ex,dp=3ex,leftskip=0.3cm,rightskip=0.3cm]{
290   \hfill\usebeamerfont{page number in head/foot}%
291 \if@noSlideNumbers%
292   %Purposefully left blank to display no slide number.%
293 \else%
294   \if@useTotalSlideIndicator%
295     \insertframenumbers/\inserttotalframenumbers%
296   \else%
297     \insertframenumbers%
298   \fi%
299 \fi%
300 \end{beamercolorbox}%
301 }
302 \setbeamertemplate{footnote}
303 {%
304   \parindent 0em\noindent%
305   \raggedright
306   \usebeamerfont{footnote}\hbox to 0.8em{\hfil\insertfootnotemark}\insertfootnotetext%
307 }

    Frametitle

308 \setbeamertemplate{frametitle}{%

```

```

309 \nointerlineskip
310 \begin{beamercolorbox}[wd=\paperwidth,leftskip=0.3cm,rightskip=0.3cm,ht=2.5ex,dp=1.
311 \usebeamerfont{frametitle}%
312 \if@protectFrameTitle%
313     \mthemetitleformat{\protect\insertframetitle}%
314 \else%
315     \mthemetitleformat{\insertframetitle}%
316 \fi%
317 \end{beamercolorbox}%
318 \if@useTitleProgressBar
319     \nointerlineskip
320     \begin{beamercolorbox}[wd=\paperwidth,ht=0.4pt,dp=0pt]{frametitle}
321         \progressbar{\paperwidth}
322     \end{beamercolorbox}
323 \fi
324 \vspace{\@mtheme@voffset}
325 }
326 \mode<all>

```

```

    misc

```

```

327 \let\otp\titlename

```

\titlename

```

328 \renewcommand{\titlename}{\otp\addtocounter{framenum}{-1}}

```

\mreducelistspacing

```

329 \newcommand{\mreducelistspacing}{\vspace{-\topsep}}

```

```

330 \linespread{1.15}

```

Font Definitions

```

331 \RequirePackage[no-math]{fontspec}
332 \defaultfontfeatures{Mapping=tex-text}
333 \setsansfont[BoldItalicFont={Fira Sans Italic},%
334             ItalicFont={Fira Sans Light Italic},%
335             BoldFont={Fira Sans}]{Fira Sans Light}
336 \setmonofont{Fira Mono}
337 \newfontfamily\ExtraLight{Fira Sans ExtraLight}
338 \newfontfamily\Light{Fira Sans Light}
339 \newfontfamily\Book{Fira Sans}
340 \newfontfamily\Medium{Fira Sans Medium}

```



```

341 \AtBeginEnvironment{tabular}{%
342   \setsansfont[BoldFont={Fira Sans},%
343     Numbers={Monospaced}]{Fira Sans Light}%
344 }

```

Font Assignment

```

345 \setbeamerfont{title}{family=\Book, size=\Large}
346 \setbeamerfont{author}{family=\ExtraLight, size=\small}
347 \setbeamerfont{date}{family=\ExtraLight, size=\small}
348 \setbeamerfont{section title}{family=\Book, size=\Large}
349 \setbeamerfont{block title}{family=\Book, size=\normalsize}
350 \setbeamerfont{block title alerted}{family=\Book, size=\normalsize}
351 \setbeamerfont{subtitle}{family=\Light, size=\fontsize{12}{14}}
352 \setbeamerfont{frametitle}{family=\Book, size=\large}
353 \setbeamerfont{caption}{size=\small}
354 \setbeamerfont{caption name}{family=\Book}
355 \setbeamerfont{description item}{family=\Book}
356 \setbeamerfont{page number in head/foot}{size=\scriptsize}

```

Bibliography

```

357 \setbeamerfont{bibliography entry author}{family=\Light, size=\normalsize}
358 \setbeamerfont{bibliography entry title}{family=\Book, size=\normalsize}
359 \setbeamerfont{bibliography entry location}{family=\Light, size=\normalsize}
360 \setbeamerfont{bibliography entry note}{family=\Light, size=\small}
361 \linespread{1.15}

```

Options

```

362 \newif\if@beamer@metropolis@blockbg
363 \@beamer@metropolis@blockbgfalse
364 \DeclareOptionBeamer{blockbg}{
365   \@beamer@metropolis@blockbgtrue
366 }

```

darkcolors

```

367 \newif\if@beamer@metropolis@darkcolors
368 \@beamer@metropolis@darkcolorfalse
369 \DeclareOptionBeamer{darkcolors}{
370   \@beamer@metropolis@darkcolorstrue
371 }

```

Unknown option error handling

```

372 \DeclareOptionBeamer*{%
373   \PackageWarning{beamercolorthememetropolis}{Unknown option `\'CurrentOption'}%
374 }
375 \ProcessOptionsBeamer

    Colors

376 \definecolor{mDarkBrown}{HTML}{604c38}
377 \definecolor{mDarkTeal}{HTML}{23373b}
378 \definecolor{mLightBrown}{HTML}{EB811B}
379 \definecolor{mLightGreen}{HTML}{14B03D}

    Base Colors

380 \if@beamer@metropolis@darkcolors
381   \setbeamercolor{normal text}{%
382     fg=black!2,
383     bg=mDarkTeal
384   }
385 \else
386   \setbeamercolor{normal text}{%
387     fg=mDarkTeal,
388     bg=black!2
389   }
390 \fi
391 \setbeamercolor{alerted text}{%
392   fg=mLightBrown
393 }
394 \setbeamercolor{example text}{%
395   fg=mLightGreen
396 }

    Derived Colors

397 \setbeamercolor{titlelike}{use=normal text, parent=normal text}
398 \setbeamercolor{structure}{%
399   fg=normal text.fg
400 }

    Frame titles and plain slides

401 \setbeamercolor{frametitle}{use=palette primary, parent=palette pri-
    mary}

```

The “primary” palette should be used for the most important navigational elements, and possibly of other elements. The metropolis color theme uses it for frame titles and slides.

```
402 \setbeamercolor{palette primary}{%
403   use=normal text,
404   fg=normal text.bg,
405   bg=normal text.fg
406 }
```

Progress bar and title separator

```
407 \setbeamercolor{title separator}{use=progress bar, parent=progress bar}
408 \setbeamercolor{progress bar}{%
409   use=alerted text,
410   fg=alerted text.fg,
411   bg=normal text.bg!50!fg
412 }
```

Blocks

```
413 \if@beamer@metropolis@blockbg
414   \setbeamercolor{block title}{%
415     use=normal text,
416     fg=normal text.fg,
417     bg=normal text.bg!80!fg
418   }
419 \else
420   \setbeamercolor{block title}{use=normal text, parent=normal text}
421 \fi
422 \setbeamercolor{block title alerted}{%
423   use={block title, alerted text},
424   bg=block title.bg,
425   fg=alerted text.fg
426 }
427 \setbeamercolor{block title example}{%
428   use={block title, example text},
429   bg=block title.bg,
430   fg=example text.fg
431 }
432 \setbeamercolor{block body alerted}{use=block body, parent=block body}
433 \setbeamercolor{block body example}{use=block body, parent=block body}
434 \setbeamercolor{block body}{
```

```

435 use={block title, normal text},
436 bg=block title.bg!50!normal text.bg
437 }

Footnotes

438 \setbeamercolor{footnote}{fg=normal text.fg!90}
439 \setbeamercolor{footnote mark}{fg=.}
440 \mode<all>

```

7.1 pgfplotsthemetol

Paul Tol's 12-color palette¹ is as follows:

```

441 \definecolor{TolDarkPurple}{HTML}{332288}
442 \definecolor{TolDarkBlue}{HTML}{6699CC}
443 \definecolor{TolLightBlue}{HTML}{88CCEE}
444 \definecolor{TolLightGreen}{HTML}{44AA99}
445 \definecolor{TolDarkGreen}{HTML}{117733}
446 \definecolor{TolDarkBrown}{HTML}{999933}
447 \definecolor{TolLightBrown}{HTML}{DDCC77}
448 \definecolor{TolDarkRed}{HTML}{661100}
449 \definecolor{TolLightRed}{HTML}{CC6677}
450 \definecolor{TolLightPink}{HTML}{AA4466}
451 \definecolor{TolDarkPink}{HTML}{882255}
452 \definecolor{TolLightPurple}{HTML}{AA4499}

```

To use these colors, we describe “cycle lists” from which PGF chooses styles for the different series in a chart.

mbarplot cycle Colors and styles intended for bar charts with up to 12 series.

```

453 \pgfplotscreateplotcyclelist{mbarplot cycle}{%
454   {draw=TolDarkBlue, fill=TolDarkBlue!70},
455   {draw=TolLightBrown, fill=TolLightBrown!70},
456   {draw=TolLightGreen, fill=TolLightGreen!70},
457   {draw=TolDarkPink, fill=TolDarkPink!70},
458   {draw=TolDarkPurple, fill=TolDarkPurple!70},
459   {draw=TolDarkRed, fill=TolDarkRed!70},
460   {draw=TolDarkBrown, fill=TolDarkBrown!70},
461   {draw=TolLightRed, fill=TolLightRed!70},

```

¹Tol actually describes several palettes; these colours are taken from the bottom row of Figure 3 in his technical note.

```

462 {draw=TolLightPink, fill=TolLightPink!70},
463 {draw=TolLightPurple, fill=TolLightPurple!70},
464 {draw=TolLightBlue, fill=TolLightBlue!70},
465 {draw=TolDarkGreen, fill=TolDarkGreen!70},
466 }

```

mlineplot cycle Colors and styles intended for line charts with up to 4 series.

```

467 \pgfplotscreateplotcyclelist{mlineplot cycle}{%
468 {TolDarkBlue, mark=*, mark size=1.5pt},
469 {TolLightBrown, mark=square*, mark size=1.3pt},
470 {TolLightGreen, mark=triangle*, mark size=1.5pt},
471 {TolDarkBrown, mark=diamond*, mark size=1.5pt},
472 }

```

However, the above cycle lists are not applied automatically. We still need to define styles — **mlineplot** and **mbarplot** — that the user can apply to the axis of a **pgfplots** chart to use the colors. We'll also take the opportunity to adjust the display of chart axes when these styles are used.

```

473 \pgfplotsset{
474   compat=1.9,

```

mlineplot A style to apply to the axis of a PGF line plot.

```

475 mlineplot/.style={
476   mbaseplot,
477   xmajorgrids=true,
478   ymajorgrids=true,
479   major grid style={dotted},
480   axis x line=bottom,
481   axis y line=left,
482   legend style={
483     cells={anchor=west},
484     draw=none
485   },
486   cycle list name=mlineplot cycle,
487 },

```

mbarplot A style to apply to the axis of a PGF bar chart. **mbarplot** uses vertical bars by default, while **horizontal mbarplot** has horizontal bars as the name implies. Their shared properties are factored out into the internal style **mbarplot base**.

```

488 mbarplot base/.style={

```

```

489     mbaseplot,
490     bar width=6pt,
491     axis y line*=none,
492   },
493   mbarplot/.style={
494     mbarplot base,
495     ybar,
496     xmajorgrids=false,
497     ymajorgrids=true,
498     area legend,
499     legend image code/.code={%
500       \draw[#1] (0cm,-0.1cm) rectangle (0.15cm,0.1cm);
501     },
502     cycle list name=mbarplot cycle,
503   },
504   horizontal mbarplot/.style={
505     mbarplot base,
506     xmajorgrids=true,
507     ymajorgrids=false,
508     xbar stacked,
509     area legend,
510     legend image code/.code={%
511       \draw[#1] (0cm,-0.1cm) rectangle (0.15cm,0.1cm);
512     },
513     cycle list name=mbarplot cycle,
514   },

```

mbaseplot Adjusts the appearance of the axes in a PGF chart.

```

515   mbaseplot/.style={
516     legend style={
517       draw=none,
518       fill=none,
519       cells={anchor=west},
520     },
521     x tick label style={
522       font=\footnotesize
523     },
524     y tick label style={
525       font=\footnotesize
526     },

```

```
527     legend style={
528         font=\footnotesize
529     },
530     major grid style={
531         dotted,
532     },
533     axis x line*=bottom,
534 },
535 disable thousands separator/.style={
536     /pgf/number format/.cd,
537     1000 sep={}
538 },
539 }
```