The Beamer class for \LaTeX

A tutorial

Meik Hellmund

Uni Leipzig, Mathematisches Institut
A minimalistic Example

\documentclass{beamer}

\begin{document}

\begin{frame}
  This is my first slide.
\end{frame}

\begin{frame}
  This is my second (and last) slide.
\end{frame}

\end{document}
The Beamer class

- slides of size $128 \times 96$ mm
- support for overlays
- appearance defined by different themes
- standard \LaTeX commands work
- creation of presentation, handouts and articles from the same source
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- support for overlays
- appearance defined by different themes
- standard LaTeX commands work
- creation of presentation, handouts and articles from the same source
The \texttt{beamer} class automatically loads some other \LaTeX\ packages, including \texttt{xcolor}, \texttt{amsmath}, \texttt{amsthm}, \texttt{calc}, \texttt{geometry}, \texttt{hyperref}, \texttt{extsizes}. 
\documentclass[...]{beamer}

Options:

- 8pt, 9pt, 10pt, 11pt, 12pt, 14pt, 17pt, 20pt
- draft – no graphics, footlines,...
- handout – no overlays
  \usepackage{pgfpages}
  \mode<handout>{\pgfpagesuselayout{2 on 1}[a4paper, border shrink=5mm]}
- xcolor=x11names – define more names for colors

Print as article:

\documentclass[]{article}
\usepackage{beamerarticle}

The beamer class automatically loads some other \LaTeX\ packages, including xcolor, amsmath, amsthm, calc, geometry, hyperref, extsizes.
\documentclass[...]{beamer}

Options:

- 8pt, 9pt, 10pt, 11pt, 12pt, 14pt, 17pt, 20pt
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\usepackage{pgfpages}
\mode<handout>{\pgfpagesuselayout{2 on 1}[a4paper,border shrink=5mm]}

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Print as article:

\documentclass[]{article}
\usepackage{beamerarticle}

The beamer class automatically loads some other LaTeX packages, including xcolor, amsmath, amsthm, calc, geometry, hyperref, extsizes.
\title[Short version]{A very long Title \over several lines}
\subtitle[short version]{A subtitle}
\date[2009]{STA Workshop 2009}
\author[M. Maier]{Max Maier}
\institute[Uni Leipzig]{Universität Leipzig}
\logo{\includegraphics[scale=.25]{unilogo.pdf}}
\begin{document}
\frame{\maketitle} % <-- generate frame with title

- short versions of title, author,... are used in head- or footlines
- several authors:
  \author[Meier et al.]{Max Meier\inst{1} \and Moritz Mayer\inst{2}}
  \institute[Leipzig and Berlin]{
    \inst{1}Department of Theoretical Applications\ Uni Ulm \and
    \inst{2}Fakultät für angewandte Theorie\ Leipzig University}
A very long Title
over several lines

A subtitle

Max Meier\textsuperscript{1} Moritz Mayer\textsuperscript{2}

\textsuperscript{1} Department of Theoretical Applications
Uni Ulm

\textsuperscript{2} Fakultät für angewandte Theorie
Leipzig University

STA Workshop 2009
A frame defines one “page” of the presentation

\begin{frame}[]{Title}{Subtitle} ... \end{frame}

Options:

- plain – no headlines, footlines, sidebars
- squeeze – squeeze all vertical spaces (this frame)
- shrink=0..100 – shrink everything by \( n \) percent
- b, c or t – vertically align at bottom, center or top (this frame: b)
- fragile – if using macros (like \texttt{verbatim}) which change catcodes (this frame)
- label=... – give frame a name for later reuse with \texttt{\againframe}

Subtitle and title are not mandatory
Environments

- usual \LaTeX environments: \texttt{itemize}, \texttt{enumerate}, \texttt{description}, ...
- usual AMS-\LaTeX environments: \texttt{theorem}, \texttt{corollary}, \texttt{definition}, ...
- additional block environments: \texttt{block}, \texttt{alertblock}, \texttt{exampleblock}, \texttt{beamercolorbox}, \texttt{beamerboxesrounded}
- multicolumns: \texttt{columns}, \texttt{column}
A block
\begin{block}{A block}
...
\end{block}

alertblock
\begin{alertblock}{An alert block}
...
\end{alertblock}

example block
\begin{exampleblock}{An example block}
...
\end{exampleblock}

Appearance of different block types is defined by style templates. Title is mandatory. Use \begin{block}{} for empty title.
beamercolorbox and beamerboxesrounded

Define beamercolors (pair of colors)
\setbeamercolor{eecks} {bg=Burlywood3, fg=RoyalBlue3}
\setbeamercolor{eecks2}{bg=Burlywood1, fg=RoyalBlue4}

\begin{beamercolorbox}[shadow=true, rounded=true]{eecks}
  ....
\end{beamercolorbox}

\begin{beamercolorbox}[wd=7cm]{eecks}
  ....
\end{beamercolorbox}

A Title

\begin{beamerboxesrounded}[lower=eecks2,upper=eecks, shadow=true]{A Title}
  ...
\end{beamerboxesrounded}
Multiple columns

\begin{columns}
\begin{column}[t]{5cm}
....
\end{column}
\begin{column}[t]{5cm}
....
\end{column}
\end{columns}

- two columns of 5 cm width
- in the columns: text,
blocks and other environments
Overlays

```latex
\begin{itemize}
  \item<1-> a first item
  \item<2-> a second item
  \item<3-> a third item
  \item<4-> \dots
\end{itemize}
```

- a first item
  - a second item
  - a third item
  - ...

M. Hellmund (Leipzig)
Overlays

\begin{itemize}
\item<1-> a first item
\item<2-> a second item
\item<3-> a third item
\item<4-> \dots
\end{itemize}

▶ a first item
▶ a second item
▶ a third item
▶ ...
Overlays

\begin{itemize}
\item<1-> a first item
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Overlays

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- a first item
- a second item
- a third item
- …
Overlays

A shorter form:

\begin{itemize}
\item a first item
\item a second item
\item a third item
\item \dots
\end{itemize}
Overlays

A shorter form:

\begin{itemize}[<+->]
\item a first item
\item a second item
\item a third item
\item \dots
\end{itemize}

▶ a first item
▶ a second item
▶ a third item
▶ ...
Overlays

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\begin{itemize}[<+->]
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\end{itemize}

▶ a first item
▶ a second item
▶ a third item
▶ \dots
Overlays

A shorter form:

\begin{itemize}[<+->]
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\item \dots
\end{itemize}

▶ a first item
▶ a second item
▶ a third item
▶ …
Overlay specifications

\begin{itemize}
\item<1-> from first layer on
\item<2-> from second layer on
\item<4> only in the 4. layer
\item<3,5-> in the 3., 5. and all further layers
\end{itemize}

- from first layer on
  - from second layer on
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All mentioned environments (itemize, ..., theorem, ..., beamer blocks) allow an overlay specification:

```latex
\begin{block}<2->[options]{Title}
  \% this block is only visible from the second layer onwards
  ...
\end{block}
```

Many commands allow an overlay specification:

```latex
\textbf<2->{commands}
  \% text is bold only from second layer onwards
\includegraphics<3-5>[scale=0.2]{unilogo}
  \% graphics only visible on layers 3,4,5
```

**The \texttt{\textbackslash pause} command**

The command `\texttt{\textbackslash pause}` allows to construct simple overlays.

\verb+	extbackslash pause+

The command \verb+\textbackslash pause+ allows \textbackslash pause to construct simple overlays. \textbackslash pause
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\begin{block}<2->[options]{Title}
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\end{block}

Many \textbf{commands} allow an overlay specification

\textbf<2->{commands}
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text for first slide

\only<1> {text for first slide}
\only<2> {this is on the 2. slide}

text for first slide this is on the 2. and 6. slide

\uncover<1> {text for first slide}
\uncover<2,6> {this is on the 2. and 6. slide}

Not on slide 3. ←
Shown on 1 and 2 ←

\alt<3>{On slide 3}{Not on slide 3.} $\leftarrow$
\temporal<3-4>{Shown on 1 and 2}{Shown on 3, 4}
{Shown on 5, ...} $\leftarrow$
this is on the 2. slide

\only<1> {text for first slide}
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On slide 3 ←
Shown on 3, 4 ←

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Not on slide 3. ←
Shown on 5, ... ←

\alt<3>{On slide 3}{Not on slide 3.} $\leftarrow$
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{Shown on 5, ...} $\leftarrow$
Problem: “wobbling” slides with \only, \alt,...

Some text for the first slide.
Possibly several lines long.

\begin{block}{}
  \begin{overlayarea}{\textwidth}{3em}
    \only<1>{Some text for the first slide.\\ Possibly several lines long.}
    \only<2>{Replacement on the second slide.}
  \end{overlayarea}
\end{block}
Problem: “wobbling” slides with \only, \alt,...

Replacement on the second slide.

\begin{block}{}
\begin{overlayarea}{\textwidth}{3em}
\only<1>{Some text for the first slide.\\
Possibly several lines long.}
\only<2>{Replacement on the second slide.}
\end{overlayarea}
\end{block}
How to show covered parts

- I used: \texttt{\setbeamercovered{transparent}}
- default: \texttt{\setbeamercovered{invisible}}
- other possibilities: \texttt{\setbeamercovered{dynamic}}
  - first item
  - second item
  - third item
  - fourth item
- or: \texttt{\setbeamercovered{transparent=50}} (default is 15% opaqueness)
  - first item
  - second item
  - third item
  - fourth item
How to show covered parts

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  - second item
  - third item
  - fourth item
Transitions between slides

\transdissolve<1-3>


Transitions between slides

\transdissolve<1-3>


Transitions between slides

\transdissolve<1-3>

Transitions between slides

\transblindsvertical

The transition effects only work in the full screen presentation mode of Acrobat Reader! You won’t see them with the usual preview programs.

Transitions between slides

\transglitter

The transition effects only work in the **fullscreen presentation mode** of Acrobat Reader! You won’t see them with the usual preview programs.

Multimedia

\usepackage{multimedia}

...\movie[width=3cm, height=2cm, loop, showcontrols, start=5s, poster]{}{film.avi}

At the moment, only this seems to work with Linux:

\movie[externalviewer]{}
{\beamergotobutton{Start movie}}{cc.mp4}
Structuring the presentation

- use the usual \section{} and \subsection{} commands between frames
- they do not generate text on the slides
- they appear in the \tableofcontents
- in many themes, they appear in the sidebar or headline
Appendix

\section{...}
\begin{frame} ... \end{frame}
\appendix
\begin{frame} ... \end{frame}
\begin{frame} ... \end{frame}

- everything after \appendix does not appear in the table of contents
- but it still affects the page counter

solution:
- set pagecounter manually after \begin{document}:
  \renewcommand{\inserttotalframenumbers}{25}
- google for appendixnumberbeamer.sty
Hyperlinks

Targets

- put \hypertarget{bla1}{} into some frame
- or \hypertarget<2>{blum3}{} in order to target the second layer of the frame

Add hyperlinks in order to jump to the targets:

- \hyperlink{bla1}{\beamergotobutton{go to bla1}} and another one: \hyperlink{blum3}{\beamergotobutton{go to blum3}}

Button types

- \beamergotobutton{go to hell}
- \beamerskipbutton{go to x}
- \beamerreturnbutton{go to y}
Presentation themes

Presentation themes completely define the appearance of the presentation. Examples:

- \usetheme{default} — very simple
- \usetheme{Madrid} — blueish, no navigation bars
- \usetheme{CambridgeUS} — red, no navigation bars
- \usetheme{Antibes} — blueish, tree-like navigation bar
- \usetheme{Berkeley} — blueish, table of contents in sidebar
- \usetheme{Marburg} — sidebar on the right
- \usetheme{Berlin} — navigation bar in the headline
- \usetheme{Szeged} — navigation bar in the headline, horizontal lines
- \usetheme{Malmoe} — section/subsection in the headline
Themes

- **inner theme** specifies appearance of blocks, enumerations and other environments inside the frame
- **outer theme** specifies head- and footlines, sidebar, logo, frame title
- **color theme** specifies colors, can be complete, inner or outer
- **font theme** specifies fonts

This defines the Madrid presentation theme:

```latex
\usecolortheme{whale} % outer color
\usecolortheme{orchid} % inner
\useinnertheme[shadow]{rounded}
\useoutertheme{infolines}
\usefonttheme{default}
```
Color themes

complete:

- albatross, beetle, crane, fly, seagull, wolverine, beaver

inner:

- lily, orchid, rose

outer:

- shale, seahorse, dolphin

Font themes

default, serif, structurebold, structureitalicserif, structuresmallcapsserif
<table>
<thead>
<tr>
<th>Inner themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ default, circles, rectangles, rounded, inmargin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outer themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>▶ default, infolines, miniframes, smoothbars, sidebar, split, shadow, tree, smoothtree</td>
</tr>
</tbody>
</table>
M. Hellmund (Leipzig)

This presentation

\documentclass[10pt, xcolor=x11names]{beamer}
\usecolortheme{seagull}
\useoutertheme{infolines}
\usefonttheme[onlymath]{serif}
\setbeamertemplate{headline}[default]
\setbeamertemplate{navigation symbols}{}
\mode<beamer>{{\setbeamertemplate{blocks}[rounded][shadow=true]}}
\setbeamercovered{transparent}
\setbeamercolor{block body example}{fg=blue, bg=black!20}