

The L^AT_EX Beamer Class

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16. November 2017

Introduction

- ▶ The \LaTeX beamer class enables the creation of presentations, handouts and articles from the same source
- ▶ Slides of size 128x96 mm
- ▶ *Overlay* and *theme* support
- ▶ Regular \LaTeX commands work

The first slide

slide.tex

```
\documentclass{beamer}
```

```
\begin{document}
```

```
\begin{frame}{A first title}
```

Simplicity is prerequisite to complexity.

```
\end{frame}
```

```
\end{document}
```

Beamer class options

```
\documentclass[options]{beamer}
```

Options

- ▶ 8pt, 9pt, 10pt, 11pt, 12pt, 14pt, 17pt, 20pt
- ▶ draft – no graphics, footlines, ...
- ▶ handout – no overlays

The beamer class automatically loads packages xcolor, amsmath, amsthm, calc, geometry, hyperref, extsizes, and others

Frames

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

Options

plain	no headlines, footlines, sidebars
squeeze	squeeze all vertical space
shrink=0..100	shrink everything by n percent
b, c, t	vertically align at bottom, center, top
fragile	required when using macros (like <code>verbatim</code>)
allowframebreaks	auto-create new frames when necessary
label=...	label frame for reuse with <code>\againframe</code>

Subtitle and title are optional

Titlepage

slide-titlepage.tex

```
\documentclass{beamer}

\begin{document}
\author{Max Mustermann}
\title{A guide to the \LaTeX\ beamer class}
\date{\today}

\begin{frame}
  \titlepage
\end{frame}
\end{document}
```

Environments

- ▶ Create bullet points with `itemize` and `enumerate` environments
- ▶ Include graphics with `figure` environment
- ▶ Include tables with `table` environment
- ▶ Include unprocessed text with `verbatim` environment
- ▶ Include math with `\(...\)` or `\[...\]` environments

Blocks

Emphasize important information using `block`, `alertblock`, or `exampleblock` environments.

```
\begin{block}{title}
```

```
...
```

```
\end{block}
```

This is a Block

This is important information

```
\begin{alertblock}{title}
```

```
...
```

```
\end{alertblock}
```

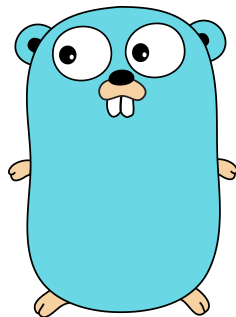
This is an Alert block

This is an important alert

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

Columns

```
\begin{columns}[c] % t,b,h  
  \column{.55\textwidth}  
  ...  
  \column{.35\textwidth}  
  \includegraphics{gopher.png}  
\end{columns}
```



Animations

Use the `\pause` command to make items appear on a slide

We start our discussion
with some concepts.

`\pause`

The first concept we
introduce originates
with Erdős.

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Use `\setbeamercovered{transparent}` or
`\setbeamercovered{dynamic}` to show covered parts

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Animations

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

```
\begin{itemize}[<+>]
  \item first
  \item second
  \item third
\end{itemize}
```

Explicitly set up individual items to appear on a particular slide within the frame using `<x-y>` syntax (left), or use shorthand (right) to auto-increment.

Animations

Most environments allow overlay specification

```
\begin{itemize}<1->
```

```
  \item ...
```

```
\end{itemize}
```

```
\begin{block}<2>
```

```
  % only visible from second layer onwards
```

```
\end{block}
```

Many commands allow them, too

```
\textbf<3-4>{bold}
```

```
\includegraphics<1,2>[scale=0.3]{gopher}
```

```
...
```

Animation

Other useful commands to create animation/overlays

```
\only<x-y>{ only visible on slide x to y }
```

```
\alt<x-y>{ visible x to y }{ visible else }
```

The `overlayarea` environment prevents *wobbling* slides when using `\only`, `\alt`, ...

```
\begin{overlayarea}{.9\textwidth}{5em}
```

...

```
\end{overlayarea}
```

Multimedia

Embedding videos is possible, using the multimedia package

```
\usepackage{multimedia}
...
\movie[width=6cm, height=6cm, start=5s, duration=6s]
{\includegraphics{image}}{movie.avi}
```

But it might not work (depending on the PDF viewer)

Structuring

It is possible to structure the document using

- ▶ `\section[Section]{My section}`
- ▶ `\subsection[Subsection]{My subsection}`
- ▶ `\subsubsection[Subsubsection]{My subsubsection}}`

before and between frames

These commands do not generate text on the slides, but appear in the `\tableofcontents`

In some themes, they appear in the sidebar or headline

Appendix

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

Everything after `\appendix` does not appear in the ToC

However, it affects the page counter

Hyperlinks

First, add a target

```
\hypertarget{foo}{} or \hypertarget<2>{bar}{}
```

Then, link it somewhere else

```
\hyperlink{foo}{\beamergotobutton{go to foo}}
```

Button types

```
\beamergotobutton{foo}
```

```
\beamerskipbutton{bar}
```

```
\beamerreturnbutton{baz}
```

Built-in themes

Beamer provides built-in themes

```
\usetheme{theme}
```

Themes

default	Copenhagen	Ilmenau	Marburg
Antibes	Darmstadt	JuanLesPins	Montpellier
Bergen	Dresden	Luebeck	PaloAlto
Berkeley	Frankfurt	Madrid	...

The DIY approach

You can create a custom theme by specifying

1. a colorscheme,
2. an innertheme,
3. an outertheme and
4. a fonttheme (not covered here)

separately

Color theme

Choose a predefined colortheme

```
\usecolortheme{colortheme}
```

Color theme

default	beetle	dove	orchid	seahorse
albatross	crane	fly	rose	whale
beaver	dolphin	lily	seagull	wolverine

Color themes can be **complete**, **inner** or **outer**

Outer theme

Select an outertheme

```
\useoutertheme{outertheme}
```

The outertheme defines the head and footline of each slide

Outer themes

infolines	miniframes	shadow	split
sidebar	smoothbars	smoothtree	tree

Inner theme

Select an innertheme

```
\useinnertheme{innertheme}
```

The innertheme defines the appearance of blocks, enumerations and other environments *inside* the frame

Inner themes

rectangles circles inmargin rounded

Custom theme example

The Madrid theme can be defined as

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


The beamer user guide

Everything you need to know

[http://www.math.uni.lodz.pl/~zofiawal/tex/
beameruserguide.pdf](http://www.math.uni.lodz.pl/~zofiawal/tex/beameruserguide.pdf)