Introduction to Beamer

Matthias Gerdts

School of Mathematics
The University of Birmingham
gerdtsm@maths.bham.ac.uk
http://web.mat.bham.ac.uk/M.Gerdts

May 2008

UNIVERSITY OF BIRMINGHAM

Contents

UNIVERSITY OF BIRMINGHAM

Contents

UNIVERSITY OF BIRMINGHAM

Contents

UNIVERSITY OF BIRMINGHAM

Contents

UNIVERSITY OF BIRMINGHAM

Contents

UNIVERSITY OF BIRMINGHAM

Contents

UNIVERSITY OF BIRMINGHAM

Current Section

UNIVERSITY OF BIRMINGHAM

Creating Presentations in BEAMER

What is BEAMER?

- BEAMER is a LaTeXdocument class designed for presentations
- BEAMER can also be used to create reports from presentations (useful for handouts or scripts, which can be created automatically)
- LaTeXbased (all common LaTeXcommands can be used)
- pictures, movies, animations etc can be included
- easy to use and extremely powerful with a wide range of different styles and themes available
- advanced users can redefine and adjust almost every detail in order to meet personal preferences

UNIVERSITY OF BIRMINGHAM

Creating PDF

Creating a PDF file:

- use `pdflatex filename` to create a PDF file
- `pdflatex` allows to use the graphic formats .pdf, .jpg, .png
- `pdflatex` does not support .ps, .eps

Download:

- BEAMER comes with most standard LaTeXinstallations
- if not: (GNU Public License)
  `http://sourceforge.net/projects/latex-beamer/`

Current Section

UNIVERSITY OF BIRMINGHAM

Beamer Presentation: Header I

Documentclass, mode, and theme:

```
\documentclass{beamer}
\mode<presentation> {
    \usetheme{Warsaw}
    \useoutertheme{infolines}
    \useinnertheme{rounded}
    \setbeamercovered{transparent}
    \setbeamertemplate{theorems}[numbered]
    \usecolortheme{rose}
}
```

alternative themes: Frankfurt, Berlin, Bergen,Boadilla, Madrid, AnnArbor, Pittsburgh, Rochester,Antibes,JuanLesPins, . . .
alternative color themes: seahorse, structure, albatross, beetle, crane, dove, fly, seagull, wolverine, . . .

UNIVERSITY OF BIRMINGHAM

Beamer Presentation: Header II

Including packages:

```
\usepackage{amsmath,amssymb}
```

Defining a titlepage:

```
\titlepage
\title[short title]{title}
\subtitle{...}
\author[short]{name1 \inst{1} \and name2 \inst{2}}
\institute[short]{\inst{1} institute1 \and \inst{2} institute2}
\date{...}
\logo{...}
```

Main document:

```
\begin{document}
   presentation
\end{document}
```

UNIVERSITY OF BIRMINGHAM

General Structure of a Presentation

```
header

\begin{document}

  \section{Section 1}

  \begin{frame}
    \frametitle{My first slide}

    a single slide

  \end{frame}

\end{document}
```

Creating Handout from Presentation

Documentclass, mode, and theme:

```
\documentclass[a4paper]{article}
\usepackage[envcountsect]{beamerarticle}
\mode<article> {
    \usepackage{fullpage}
}
```

Then: include packages, define titlepage, . . .

Main document:

```
\begin{document}

    presentation


\end{document}
```

Current Section

UNIVERSITY OF BIRMINGHAM

Frame Environment I

A single slide is defined as follows:

```
\begin{frame}
    \frametitle{title}

    \framesubtitle{subtitle}

    content in standard LaTeX notion

\end{frame}
```

Remark: only those contents are displayed which fit on a single page

Frame Environment II

Slides with (automatic) pagebreaks are defined as follows:

```
\begin{frame}[allowframebreaks]
    \frametitle{title}

    \framesubtitle{subtitle}

    content in standard LaTeX notion

\end{frame}
```

The `\newpage` or `\pagebreak` commands can be used to enforce a pagebreak at a specified position.

UNIVERSITY OF BIRMINGHAM

Structuring

The commands

```
\part{title}
\section{title}
\subsection{title}
```

known from LaTeX can be used to structure the presentation. These commands can be used outside of the frame environment. The solely purpose is to create an entry in the table of contents.

Table of Contents I

Table of contents – all at once:

```
\begin{frame}
    \frametitle{Contents}

    \tableofcontents

\end{frame}
```

Table of contents – with pause:

```
\begin{frame}
    \frametitle{Contents}

    \tableofcontents[pausesections,shaded]


\end{frame}
```

UNIVERSITY OF BIRMINGHAM

Table of Contents II

Table of contents – displayed at begin of each section:

```
\AtBeginSection[] {
\begin{frame}<beamer>
    \frametitle{Current Section}

    \tableofcontents[currentsection]


\end{frame}}
```

Current Section

UNIVERSITY OF BIRMINGHAM

Theorems, Definitions, Remarks, . . . I

Theorems, definitions, examples, . . . can be defined as usual:

Theorem 1 (This is a theorem)

```
\begin{theorem}[This is a theorem]
    theorem
\end{theorem}
```

Definition 2 (This is a definition)

```
\begin{definition}[This is a definition]
    definition
\end{definition}
```

Theorems, Definitions, Remarks, . . . II

Example 3 (This is an example)

```
\begin{example}[This is an example]
    example
\end{example}
```

Proof.

```
\begin{proof}
    proof
\end{proof}
```

□

This is a block environment

```
\begin{block}{This is a block environment}
    text
\end{block}
```

UNIVERSITY OF BIRMINGHAM

Current Section

UNIVERSITY OF BIRMINGHAM

Overlays

In order to display parts of text step by step the command `\pause` can be used, e.g.

- 2 is prime
- 3 is prime
- 4 is not prime

In LaTeX:

```
\begin{itemize}
\item 2 is prime \pause
\item 3 is prime \pause
\item 4 is not prime
\end{itemize}
```

Overlays

In order to display parts of text step by step the command `\pause` can be used, e.g.

- 2 is prime
- 3 is prime
- 4 is not prime

In LaTeX:

```
\begin{itemize}
\item 2 is prime \pause
\item 3 is prime \pause
\item 4 is not prime
\end{itemize}
```

UNIVERSITY OF BIRMINGHAM

Overlays

In order to display parts of text step by step the command `\pause` can be used, e.g.

- 2 is prime
- 3 is prime
- 4 is not prime

In LaTeX:

```
\begin{itemize}
\item 2 is prime \pause
\item 3 is prime \pause
\item 4 is not prime
\end{itemize}
```

Overlays

In order to display parts of text step by step the command `\pause` can be used, e.g.

- 2 is prime
- 3 is prime
- 4 is not prime

In LaTeX:

```
\begin{itemize}
\item 2 is prime \pause
\item 3 is prime \pause
\item 4 is not prime
\end{itemize}
```

Overlays

In order to display items in an itemize or enumerate environment in a specified order the command `\item<pages>` can be used:

1. this text appears from the first slide on
2. this text appears from the second slide on
3. this text appears from the third slide on
4. this text appears only on the first and second slide

In LaTeX:

```
\begin{enumerate}
\item<1-> this text appears from the first slide on
\item<2-> this text appears from the second slide on
\item<3-> this text appears from the third slide on
\item<1-2> this text appears only on the first and second slide
\end{enumerate}
```

Overlays

In order to display items in an itemize or enumerate environment in a specified order the command `\item<pages>` can be used:

1. this text appears from the first slide on
2. this text appears from the second slide on
3. this text appears from the third slide on
4. this text appears only on the first and second slide

In LaTeX:

```
\begin{enumerate}
\item<1-> this text appears from the first slide on
\item<2-> this text appears from the second slide on
\item<3-> this text appears from the third slide on
\item<1-2> this text appears only on the first and second slide
\end{enumerate}
```

Overlays

In order to display items in an itemize or enumerate environment in a specified order the command `\item<pages>` can be used:

1. this text appears from the first slide on
2. this text appears from the second slide on
3. this text appears from the third slide on
4. this text appears only on the first and second slide

In LaTeX:

```
\begin{enumerate}
\item<1-> this text appears from the first slide on
\item<2-> this text appears from the second slide on
\item<3-> this text appears from the third slide on
\item<1-2> this text appears only on the first and second slide
\end{enumerate}
```

Overlays

In order to display parts of the text in a specified order, the commands

```
\only<pagerange>{...}
\onslide<pagerange>{...}
\uncover<pagerange>{...}
```

can be used:

```
\onslide<2-3,5>{this text appears on slides 2,3,5 only}

\uncover<3->{Text shown from slide 3 on.} text occupies space on all
other slides
```

Remark: `\only` does not occupy space while `\uncover` does.

UNIVERSITY OF BIRMINGHAM

Overlays

In order to display parts of the text in a specified order, the commands

```
\only<pagerange>{...}
\onslide<pagerange>{...}
\uncover<pagerange>{...}
```

can be used:

```
\onslide<2-3,5>{this text appears on slides 2,3,5 only}

\uncover<3->{Text shown from slide 3 on.} text occupies space on all
other slides
```

Remark: `\only` does not occupy space while `\uncover` does.

Overlays

In order to display parts of the text in a specified order, the commands

```
\only<pagerange>{...}
\onslide<pagerange>{...}
\uncover<pagerange>{...}
```

can be used:

```
\onslide<2-3,5>{this text appears on slides 2,3,5 only}

\uncover<3->{Text shown from slide 3 on.} text occupies space on all
other slides
```

Remark: `\only` does not occupy space while `\uncover` does.

UNIVERSITY OF BIRMINGHAM

Overlays

In order to display parts of the text in a specified order, the commands

```
\only<pagerange>{...}
\onslide<pagerange>{...}
\uncover<pagerange>{...}
```

can be used:

```
\only<4->{this text appears from slide 4 on}

\onslide<2-3,5>{this text appears on slides 2,3,5 only}

\uncover<3->{Text shown from slide 3 on.} text occupies space on all
other slides
```

Remark: `\only` does not occupy space while `\uncover` does.

UNIVERSITY OF BIRMINGHAM

Overlays

In order to display parts of the text in a specified order, the commands

```
\only<pagerange>{...}
\onslide<pagerange>{...}
\uncover<pagerange>{...}
```

can be used:

```
\only<4->{this text appears from slide 4 on}

\onslide<2-3,5>{this text appears on slides 2,3,5 only}

\uncover<3->{Text shown from slide 3 on.} text occupies space on all
other slides
```

Remark: `\only` does not occupy space while `\uncover` does.

UNIVERSITY OF BIRMINGHAM

Mode Specifications

It is possible to specify passages in the presentation depending on the current mode <presentation> or <handout> or <article>:

- `\only<article>{This text only appears in article mode}`
- `\begin{frame}<presentation> ... \end{frame}`
- `\section<presentation>{section only exists in presentation mode}`

Current Section

UNIVERSITY OF BIRMINGHAM

Highlighting, Colours, Fonts

- `\alert{text}` prints `text` in red.
- `\setbeamerfont{title}{shape=\itshape,family=\rmfamily}`
  changes font for the title
- `\setbeamercolor{normal text}{bg=red!20}`
  changes colours for normal text

Adjusting the Style

Adjustments to the style of BEAMER can be done using the command

```
\setbeamertemplate{beamer element}[option]{your definition}
```

`beamer element` denotes a template defined in BEAMER and `your definition` denotes the assigned value to this template.

Example:

```
\setbeamertemplate{headline}{user defined headline}
```

can be used to define a new headline.
There are hundreds of templates that can be adjusted if desired.

UNIVERSITY OF BIRMINGHAM

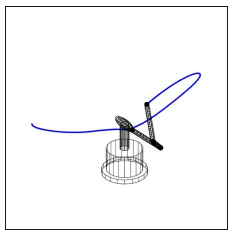
Movies and External Documents

Movies (or any document) can be included using the following command:

```
\href{run:filename}{text or image}
```

BEAMER does not handle external filetypes (.pdf,.mpg,.avi,.doc,...) explicitly: BEAMER just sends the command to the operating system and the application associated with the filetype is executed by the operating system

Example:



```
\href{run:manutecr3_vorne.mpg}{
      \includegraphics[scale=0.08]{manutecr3_vorne.jpg}}
```

Special Effects

- it's possible to include movies (and even sound) inline using the package `movie15`; see http://www.uoregon.edu/∼noeckel/PDFmovie.html
- it's possible to include effects known from powerpoint presentations like slides coming from the left or right, top or bottom

Special Effect: Slide Transition

This slide transition scheme obtained by the command (put inside of a frame environment)

```
\transdissolve
```

Special Effect: Shaded Background

This shading was obtained by the command (put outside of a frame)

```
\setbeamertemplate{background canvas}[vertical shading][
top=blue,bottom=white]
```

References

References can be added as usual using `\cite{...}`

F. H. CLARKE, *Optimization and Nonsmooth Analysis*, John Wiley & Sons, New York, 1983.

In LaTeX:

```
\begin{thebibliography}{10}
\beamertemplatebookbibitems
\bibitem{Cla83}
{\sc F. H. Clarke}, {\em Optimization and Nonsmooth Analysis}, John
Wiley & Sons, New York, 1983.

\end{thebibliography}
```

Appendix

An appendix can be added as usual using `\appendix` outside of a frame environment.

```
\appendix
\section{Appendix 1}
\begin{frame}

    content


\end{frame}
```

And much more...

- creating hyperlinks for jumping from slide to slide
- zoom features for complicated graphics
- sound
- adding notes
- ...

Thanks for your attention!

Questions?

Further information:

gerdtsm@maths.bham.ac.uk
web.mat.bham.ac.uk/M.Gerdts

UNIVERSITY OF BIRMINGHAM