Fun with Beamer ...and HAPPY BIRTHDAY SHAWN!

Tina Li, Thomas Graul, and Niranjan Balachandar

June 29, 2016

Table of Contents

- Intro to Beamer
 - About Beamer
 - Basic Structure
- Overlaying Concepts
 - Specifications
 - Examples: Lists, Graphics, Tables
- Adding that Sparkle
 - Sections
 - Themes

Table of Contents

- Intro to Beamer
 - About Beamer
 - Basic Structure
- Overlaying Concepts
 - Specifications
 - Examples: Lists, Graphics, Tables
- Adding that Sparkle
 - Sections
 - Themes

What Is Beamer?

- Beamer is a flexible LATEX class for making slides and presentations.
- It supports functionality for making PDF slides complete with colors, overlays, environments, themes, transitions, etc.
- Adds a couple new features to the commands you've been working with.

What Is Beamer?

- Beamer is a flexible LATEX class for making slides and presentations.
- It supports functionality for making PDF slides complete with colors, overlays, environments, themes, transitions, etc.
- Adds a couple new features to the commands you've been working with.
- As you probably guessed, this presentation was made using the Beamer class.

Document Template: slides.tex

```
%% title frame
\begin{frame}
    \titlepage
\end{frame}
%% normal frame
\begin{frame}{Frame title}
    The body of the frame.
\end{frame}
\end{document}
```

athena% make slides.pdf

What would you like in your sandwich?

• So what can you do between \begin{frame} and \end{frame}?

What would you like in your sandwich?

- So what can you do between \begin{frame} and \end{frame}?
- Pretty much anything you can do in a normal LATEX document:

What would you like in your sandwich?

- So what can you do between \begin{frame} and \end{frame}?
- Pretty much anything you can do in a normal LATEX document:
 - figures, tables, equations, normal text, etc.

Don't Do This

Here is a well-known formula:

$$\sum_{k=0}^{n} k = \frac{n(n+1)}{2}$$

• Here is a less well-known, but still useful, formula:

$$\sum_{k=0}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$$

• This is pretty well-known, too:

$$\sum_{k=0}^{n} k^3 = \left(\frac{n(n+1)}{2}\right)^2$$

• Who knows about this one?

$$\sum_{k=0}^{n} k^4 = \frac{n(6n^4 + 15n^3 + 10n^2 + 1)}{30}$$

• Have fun factoring the quartic expression!

Table of Contents

- Intro to Beamer
 - About Beamer
 - Basic Structure
- Overlaying Concepts
 - Specifications
 - Examples: Lists, Graphics, Tables
- Adding that Sparkle
 - Sections
 - Themes

Watch this slide grow.

Watch this slide grow.

• Hello, World!

Watch this slide grow.

- Hello, World!
- Hello, Mars!

Watch this slide grow.

- Hello, World!
- Hello, Mars!
- Hello, Alpha Centauri!

The Rudimentary pause: Backstage

```
Watch this slide grow.
\pause
\begin{itemize}
  \item Hello, World!
  \pause
  \item Hello, Mars!
  \pause
  \item Hello, Alpha Centauri!
\end{itemize}
```

The Specification

 Professor: I want you to read the textbook to prepare for tomorrow's lecture.

The Specification

- Professor: I want you to read the textbook to prepare for tomorrow's lecture.
- Student: Which chapter should I read?

The Specification

- Professor: I want you to read the textbook to prepare for tomorrow's lecture.
- Student: Which chapter should I read?
- Professor: *Specifically*, Chapters <1-3, 6, 10->.

Watch this slide grow.

Watch this slide grow.

• Hello, World!

Watch this slide grow.

- Hello, World!
- Hello, Mars!

Watch this slide grow.

- Hello, World!
- Hello, Mars!
- Hello, Alpha Centauri!

Specificationizing the Rudimentary pause: Backstage

```
Watch this slide grow.
\begin{itemize}
  \item<2-> Hello, World!
  \item<3-> Hello, Mars!
  \item<4-> Hello, Alpha Centauri!
\end{itemize}
```

Useful Commands that Work with Specifications

\textbf<>{}	controls when to bold text	\only<>{}	controls when to reveal text, occu- pies NO space oth- erwise
\textit<>{}	controls when to italicize text	\uncover<>{}	controls when to reveal text, DOES occupy space oth- erwise
\color<>[]{}	controls when to change color of text	\alt<>{}{}	reveals first argument when specification is true, otherwise reveals second argument
\alert<>{}	controls when to highlight text (de- fault red)	\item<>	controls when an item is shown

Which president said, "Most folks are about as happy as they make up their minds to be"?

Hints:

Which president said, "Most folks are about as happy as they make up their minds to be"?

A James Madison

Hints:

James Madison ate broccoli.

Which president said, "Most folks are about as happy as they make up their minds to be"?

A James Madison

B Harry Truman

Hints:

James Madison ate broccoli. Harry Truman drank milk.

Which president said, "Most folks are about as happy as they make up their minds to be"?

- A James Madison
- **B** Harry Truman
- C Abraham Lincoln

Hints:

James Madison ate broccoli. Harry Truman drank milk.

Abe Lincoln raised bees.

Which president said, "Most folks are about as happy as they make up their minds to be"?

- A James Madison
- **B** Harry Truman
- C Abraham Lincoln
- D Calvin Coolidge

Hints:

James Madison ate broccoli.

Harry Truman drank milk.

Abe Lincoln raised bees.

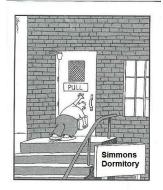
And Cal Coolidge grew silk.

Which president said, "Most folks are about as happy as they make up their minds to be"?

C Abraham Lincoln

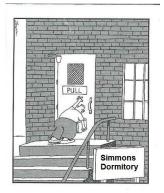
Lists: The \$1,000,000 Question: Backstage

```
\begin{enumerate}[A]
    \item<2-5> James Madison
    \item<3-5> Harry Truman
    \item<4-> \color<6>[rgb]{0,0.6,0}Abraham Lincoln
    \item<5-5> Calvin Coolidge
\end{enumerate}
\uncover<1-5>{Hints:}\\
\uncover<2-5>{James Madison ate broccoli.}\\
\uncover<3-5>{Harry Truman drank milk.}\\
\uncover<4-5>{Abe Lincoln raised bees.}\\
\uncover<5-5>{And Cal Coolidge grew silk.}\\
```



а

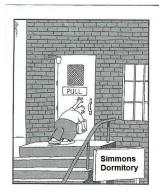
^aApologies to Gary Larson



а

Observation Simmons Hametal and c

^aApologies to Gary Larson



2

Observation

Simmons Hametal and c

Observation

Simmons Do

^aApologies to Gary Larson



^aApologies to Gary Larson

Observation

Simmons Hametal and c

Observation

Simmons Do

Conclusion

Simmons Ha

Columns and Blocks: Backstage I

Columns and Blocks: Backstage II

```
\column{0.5\textwidth}
      \begin{block}<2->{Observation 1}
          Simmons Hall is composed of metal and concrete.
      \end{block}
      \begin{block}<3->{Observation 2}
          Simmons Dormitory is composed of brick.
      \end{block}
      \begin{block}<4->{Conclusion}
          Simmons Hall $\not=$ Simmons Dormitory.
      \end{block}
\end{columns}
```

Math stuff

Easy Theorem

The equation

$$x^n + y^n = z^n,$$

has no integer solutions for n > 2 where $x, y, z \neq 0$.

Math stuff

Easy Theorem

The equation

$$x^n + y^n = z^n,$$

has no integer solutions for n > 2 where $x, y, z \neq 0$.

Remark

This problem was first posed in 10,000 B.C.

Math stuff

Easy Theorem

The equation

$$x^n + y^n = z^n,$$

has no integer solutions for n > 2 where $x, y, z \neq 0$.

Proof

The proof is trivial and left as an exercise for the reader.

Remark

This problem was first posed in 10,000 B.C.

Math stuff: Backstage

```
\newtheorem{thm}{Easy Theorem}
\newtheorem{pf}{Proof}
\newtheorem{rmk}{Remark}
\begin{thm}<1->
    x^n+y^n=z^n,
    has no integer solutions for $n>2$
    where x,\,y,\,z\, \
\end{thm}
\left( \frac{pf}{3} \right)
    The proof is trivial and left as an exercise.
\end{pf}
\begin{rmk}<2->
    This problem was first posed in $10,000$ B.C.
\end{rmk}
```

Ice Cream Store	Location	How to Get There

Ice Cream Store	Location	How to Get There
Toscanini's	Central Square	Just walk!

Ice Cream Store	Location	How to Get There
Toscanini's	Central Square	Just walk!
Herrell's	Harvard Square	Red Line

Ice Cream Store	Location	How to Get There
Toscanini's	Central Square	Just walk!
Herrell's	Harvard Square	Red Line
J.P. Licks	Davis Square	Red Line

Ice Cream Store	Location	How to Get There
Toscanini's	Central Square	Just walk!
Herrell's	Harvard Square	Red Line
J.P. Licks	Davis Square	Red Line
Ben & Jerry's	Newbury Street	Green Line

Building Tables: Backstage

```
\begin{table}[bt]
\begin{tabular}{||1|c|c|} \hline
  \textbf{Ice Cream Store}
                                & \textbf{Location}
                                & \textbf{How to Get There} \\ \hline
  \uncover<2->{Toscanini's}
                                & \uncover<2->{Central Square}
                                & \uncover<2->{Just walk!}
                                                               11
  \uncover<3->{Herrell's}
                                & \uncover<3->{Harvard Square}
                                & \uncover<3->{Red Line}
  \uncover<4->{J.P. Licks}
                                & \uncover<4->{Davis Square}
                                & \uncover<4->{Red Line}
                                                               //
                                & \uncover<5->{Newbury Street}
  \uncover<5->{Ben \& Jerry's}
                                & \uncover<5->{Green Line}
                                                               \\ \hline
\end{tabular}
\end{table}
```

Table of Contents

- Intro to Beamer
 - About Beamer
 - Basic Structure
- Overlaying Concepts
 - Specifications
 - Examples: Lists, Graphics, Tables
- Adding that Sparkle
 - Sections
 - Themes

Using Sections

• Treat sections just like you would in a paper.

Using Sections

- Treat sections just like you would in a paper.
- Use \tableofcontents[section] to keep audience informed of your talk's general plan.

Using Sections

- Treat sections just like you would in a paper.
- Use \tableofcontents[section] to keep audience informed of your talk's general plan.
- Use \AtBeginSection[]{specialframe} to help audience follow the structure of your talk.

Using Sections: Backstage I

```
\section{Intro to Beamer}
\subsection{About Beamer}
\subsection[Basic Structure]{Basic Structure}
\subsection{How to Compile}
\section{Overlaying Concepts}
\subsection{Specifications}
\subsection[Examples] {Examples: Lists, Graphics, Tables}
\section[Sparkle]{Adding that Sparkle}
\subsection{Sections}
\subsection{Themes}
\section*{References}
```

Using Sections: Backstage II

```
\AtBeginSection[]
{
    \begin{frame}{Table of Contents}
     \tableofcontents[currentsection]
    \end{frame}
}
```

See, I can get a ToC anywhere!

- Intro to Beamer
 - About Beamer
 - Basic Structure
- Overlaying Concepts
 - Specifications
 - Examples: Lists, Graphics, Tables
- Adding that Sparkle
 - Sections
 - Themes

Pre-customized Templates

- To make your presentation use a shiny theme like ours:
 - Find \modeentation>{} at the top of your file
 - Insert \usetheme{Warsaw} into the {}
- Also available within each Presentation Theme:
 - Color themes: \usecolortheme{colorthemename} control colors for bullets, background, text, etc.
 - Inner themes: \useinnertheme{innerthemename} control main title, environments, figures and tables, footnotes, etc.
 - Outer themes: \useoutertheme{outerthemename} control head-/foot-lines, sidebars, frame titles, etc.

A Sampling of Themes

• General themes:

```
default Antibes Berlin Copenhagen
Madrid Montpelier Ilmenau Malmoe
CambridgeUS Berkeley Singapore Warsaw
```

- Also available:
 - Color themes: beetle, beaver, orchid, whale, dolphin
 - Inner themes: circles, rectanges, rounded, inmargin
 - Outer themes: infolines, smoothbars, sidebar, split, tree
- See The Beamer Theme Matrix

Good sites to visit for Beamer help

- The Beamer User Guide
- The Beamer Homepage
- A Quick Tutorial
- A Beamer Quickstart
- A Long Tutorial
- LATEX + Beamer Examples
- A Beamer Presentation on Beamer