Disclaimer #1

I am NOT an expert in \LaTeX
I am NOT an expert in Beamer

Disclaimer #2

This talk is designed to introduce you to presentations in \LaTeX

... and showcase cool features of Beamer
Why Use \LaTeX\ for Presentations (and everything else)?

\begin{center}
\textbf{Because Microsoft SUCKS!}
\end{center}

\ldots\ldots especially for mathematics \ldots\ldots

\[
\frac{\partial^2 u}{\partial t^2} = c^2 \nabla^2 u
\]

\[
\int_0^\infty e^{-x} = 1
\]

\[
f(x) = a_o + \sum_{n=1}^{\infty} \left[ a_n \cos \left( \frac{n\pi x}{L} \right) + b_n \sin \left( \frac{n\pi x}{L} \right) \right]
\]

\[
\psi(x) = \begin{cases} \dfrac{1}{x^2} & \text{if } x < 0 \\ \dfrac{x^2}{4} & \text{if } x \geq 0 \end{cases}
\]
\LaTeX \text{can} \ \textbf{DRAW} \ \text{cool diagrams!}
Why Use the *Beamer* Class?

**Pros**

1. More bells & whistles than the *Prosper* class
2. Directly supported by **pdflatex**
   - can still use latex2e, dvips, ps2pdf (*HAVE* to when using **pstricks**)
3. Rich overlay & transition effects
4. Navigational bars & symbols
5. Outputs: screen, handouts, notes, etc.
6. Customizable

**Cons**

1. Isn’t “what you see is what you get”
Basic Code

**Beamer class loading with themes**

\documentclass{beamer}
\mode<presentation>
\usetheme{Warsaw} % Beamer Theme
\usecolortheme{lily} % Beamer Color Theme

**Title Page**

\begin{document}
\frame{ % the title page
\titlepage
}
\end{document}
Many features you want to use require you to load packages, such as:

\usepackage{amsmath} % for math AMS fonts
\usepackage{graphicx} % to include figures
\usepackage{subfigure} % to have figures in figures
\usepackage{multimedia} % to include movies
Themes

Five Theme Categories

1. Presentation *(the slide template)*
2. Color* *(color scheme for slide template)*
3. Font*
4. Inner* *(how you want bullets, boxes, etc. to look)*
5. Outer* *(how you want the top/bottom of frames to look)*

* if you don’t like the default of the Presentation Theme

Example

\documentclass[compress, red]{beamer}
\usetheme{Warsaw}
\usecolortheme{lily}
\useoutertheme[subsection=false]{smoothbars}
\useinnertheme{rectangles}
Beamer *Options* Examples

- `[compress]`: makes all navigation bars as small as possible
  DEFAULT: uncompressed

- `[red]`: changes color scheme to red
  DEFAULT for beamer theme Warsaw: blue

- `[subsection=false]`: removes an extra bar above slide title stating the subsection title
  DEFAULT: true
Using Color

* Beamer automatically loads ‘xcolor’ *

- **Predefined colors:**
  - red, blue, green, cyan, magenta, yellow, black, darkgray, gray, lightgray, orange, violet, purple, & brown

- **To define new colors:**
  \xdefinecolor{darkgreen}{rgb}{0,0.35,0}: my new color is dark green
  \xdefinecolor{purpleish}{cmyk}{0.75,0.75,0,0}: color is purple-ish

- **Or substitute colors:**
  \colorlet{newred}{red!60!black}: my new color is dark red
There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}

   does the overlay sequentially

\textbf{Example}
Overlays

There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}
   
   does the overlay sequentially

\textbf{Example}

- I'm
- showing
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\textbf{EXAMPLE}

- I'm
- showing
- you
- \texttt{pause}
There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}

   does the overlay sequentially

\textbf{Example}

- I'm
- showing
- you
- \texttt{\textit{pause}}
There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}

2. \texttt{\textbackslash item<n->} (means “from overlay n”)

   \texttt{\textbackslash item<2>} (means “only overlay 2”)

   \texttt{\textbackslash item<2,4>} (means “only overlay 2 & 4”)

   does non-sequential overlays in the bullet-type (ie. \texttt{itemize}), environments

**Example**

- I'm
- showing
Overlays

There are multiple ways to do overlays:

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   does non-sequential overlays in the bullet-type (ie. `itemize`), environments

**EXAMPLE**

- showing
- you
There are multiple ways to do overlays:

1. \texttt{\textbackslash{}pause}

2. \texttt{\textbackslash{}item\textless{}n\textgreater{}} (means “from overlay n”)
   - \texttt{\textbackslash{}item\textless{}2\textgreater{}} (means “only overlay 2”)
   - \texttt{\textbackslash{}item\textless{}2,4\textgreater{}} (means “only overlay 2 & 4”)

   does non-sequential overlays in the bullet-type (ie. \texttt{itemize}), environments

**Example**

- showing

- \texttt{\textbackslash{}item\textless{}>}
Overlays

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   does non-sequential overlays in the bullet-type (ie. `itemize`), environments

**Example**

- showing

- `\item<>`
Overlays

There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}
2. \texttt{\textbackslash item<n>}
3. \texttt{\textbackslash onslide<n>}

non-sequential overlays in any environment!

\textbf{EXAMPLE}
- I'm
There are multiple ways to do overlays:

1. \pause
2. \item<n->
3. \onslide<n->
   non-sequential overlays in any environment!

**Example**

- I'm showing
There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}
2. \texttt{\textit{item}<n->}
3. \texttt{\textit{onslide}<n->}

   non-sequential overlays in any environment!

\textbf{Example}

- I'm
- showing you
There are multiple ways to do overlays:

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\textbf{Example}

- I'm
- showing
- you
- \texttt{\textbackslash onslide<>}
There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}
2. \texttt{\textbackslash item<n->}
3. \texttt{\textbackslash onslide<n->}

   non-sequential overlays in any environment!

**Example**

- I’m
- showing
- you
- \texttt{\textbackslash onslide<>}

\begin{itemize}
  \item I’m \texttt{\textbackslash onslide<2>} showing \texttt{\textbackslash onslide<3>} you \texttt{\textbackslash onslide<4>} you
  \item \texttt{\textbackslash textit\{$\textbackslash backslash$ onslide$<>\$}}
\end{itemize}
Overlays

There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}
2. \texttt{\textbackslash item\{n\-\}}
3. \texttt{\textbackslash onslide\{n\-\}}
4. Replace
   - \texttt{\textbackslash only\{n\}{\ldots}: successive}
   - \texttt{\textbackslash uncover\{n\}{\ldots}: shows at n}
   - \texttt{\textbackslash invisible\{n\}{\ldots}: hides at n}
   - \texttt{\textbackslash alt\{at n\}{\not at n\}: 2 alternatives}
   - \texttt{\textbackslash temporal\{before\}{at n\}{after\}: 3 alternatives}
   - \texttt{overprint \& overlayarea environments}
5. Highlighting
   - \texttt{\textbackslash item\{+-\|alert\++\}}
Overlays

There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}

2. \texttt{\textbackslash item\{n\-\>}

3. \texttt{\textbackslash onslide\{n\-\>}

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   - \texttt{\textbackslash only\{n\}\{\ldots\}}: successive
   - \texttt{\textbackslash uncover\{n\}\{\ldots\}}: shows at \(n\)
   - \texttt{\textbackslash invisible\{n\}\{\ldots\}}: hides at \(n\)
   - \texttt{\textbackslash alt\{at \(n\}\}\{not \ at \(n\)\}}: 2 alternatives
   - \texttt{\textbackslash temporal\{before\}\{at \(n\)\}\{after\}}: 3 alternatives
   - \texttt{\textbackslash overprint} \& \texttt{\textbackslash overlayarea} environments

5. Highlighting
   - \texttt{\textbackslash item\{+-\}|alert\{+-\>}
   - \texttt{\textbackslash item\{2-\}>\textbackslash alert\{n\}\{stuff\}
Overlays

There are multiple ways to do overlays:

1. \texttt{\textbackslash pause}
2. \texttt{\textbackslash item\textless n\textgreater}
3. \texttt{\textbackslash onslide\textless n\textgreater}
4. Replace
   - \texttt{\textbackslash only\textless n\textgreater\{...\}: successive}
   - \texttt{\textbackslash uncover\textless n\textgreater\{...\}: shows at n}
   - \texttt{\textbackslash invisible\textless n\textgreater\{...\}: hides at n}
   - \texttt{\textbackslash alt\textless n\textgreater\{at n\}\{not at n\}: 2 alternatives}
   - \texttt{\textbackslash temporal\textless n\textgreater\{before\}\{at n\}\{after\}: 3 alternatives}
   - \texttt{overprint} & \texttt{overlayarea} environments
5. Highlighting
   - \texttt{\textbackslash item\textless +\textgreater\textbar\texttt{alert}\textbar+}
   - \texttt{\textbackslash item\textless 2\textgreater\textbar\texttt{alert}\textless n\textgreater\{stuff\}}
   - \texttt{\textbackslash item\textless 2\textgreater\textbar\texttt{alt}\textless 3\textgreater\{	exttt{\textcolor{green}stuff}\}\{	exttt{\textcolor{red}stuff}\}}
Overlays

There are multiple ways to do overlays:

1. \pause
2. \item\(<n->
3. \onslide\(<n->
4. Replace
   - \only\(<n>{...}: successive
   - \uncover\(<n>{...}: shows at \(n\)
   - \invisibl\(<n>{...}: hides at \(n\)
   - \alt\(<n>{at n}{not at n}: 2 alternatives
   - \temporal\(<n>{before}{at n}{after}: 3 alternatives
   - overprint & overlayarea environments
5. Highlighting
   - \item\(<+-|alert+>
   - \item\(<2->|alert\(<n>{stuff}
   - \item\(<2->|alt\<3>{\color{green} stuff}\{\color{red} stuff}
Transition Effects

* This slide uses transparent overlays: *
\setbeamercovered{transparent}

Text Animation:

- \animate, \animatevalue, etc.
- can do timed overlays, etc.

Slide Transitions:

- Seven options: Blinds, Box, Dissolve, Glitter, Replace, Split, Wipe

Examples

- Dissolve: \transdissolve
- Glitter: \transglitter[direction=90]
- Split (2 vertical lines sweep outward): \transsplitverticalout
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* This slide uses transparent overlays: *
\setbeamercolor{transparent}

Text Animation:
- \animate, \animatevalue, etc.
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Examples
- Dissolve: \transdissolve
- Glitter: \transglitter[direction=90]
- Split (2 vertical lines sweep outward): \transsplitverticalout
Figures

- Standard \LaTeX\ \texttt{figure} environment can be used.

- Using the \texttt{graphicx} package:
  - doesn’t support all figures types:
    - easy fix: make ALL figures pdfs
      (eg. convert eps using \texttt{epstopdf})

\begin{figure}
\includegraphics[width=\columnwidth]{myprettyfigure}
\end{figure}

- can also use \texttt{pgfimage}

\texttt{\pgfimage[height=4cm]{myprettyfigure}}

* NOTICE that you don’t have to specify the file type *
You can zoom into portions of your figures

\framezoom< 1 > < 2 > [border](0cm, 3.5cm)(2.75cm, 1cm)
\framezoom< 1 > < 3 > [border](3cm, 3.5cm)(1cm, 1cm)
\pgfimage[height=4cm]{ambersmice}
Figures - Zooming

You can zoom into portions of your figures using the `framezoom` command. For example:

```
\framezoom<1><2>(border)(0cm, 3.5cm)(2.75cm, 1cm)
```

and

```
\framezoom<1><3>(border)(3cm, 3.5cm)(1cm, 1cm)
```

Additionally, you can use `pgfimage` to include images:

```
\pgfimage[height=4cm]{ambersmice}
```
Figures - Zooming
\usepackage{multimedia}

\frame{
  \movie[height=1.125in,width=1.5in,poster]{}{Chemotaxis.mov}
}

* \movie[options]{text, picture, etc to click on}{name of movie}

* Should support all major movie types: .avi, .mov, etc.

Problems: make sure Acrobat has the correct plug-ins!!!
Does NOT work on Linux/Unix systems?!?!

* You may need to use the externalviewer option
Using Columns

The *column* environment is **extremely useful**!

- allows you to add as many columns as you want
- can put multiple column environments on any page

\begin{columns}[t]
\column{0.25\textwidth}
  ... contents ...
\column{0.5\textwidth}
  ... contents ...
\column{0.25\textwidth}
  ... contents ...
\end{columns}
Theorems, etc.

The `\begin{theorem}` \texttt{\end{theorem}} environment for theorems/proofs:

\begin{verbatim}
\begin{theorem}
  Write your fantastic theorem here \ldots
\end{theorem}
\end{verbatim}

Or to highlight points:

\begin{verbatim}
\begin{block}
  Beamer is cool!
\end{block}
\end{verbatim}
Fragile Environments & Hyperlinks

Fragile Environments

You **CANNOT** use `verbatim` without specifying it in the frame `options`:

```latex
\frame[containsverbatim]{ \frametitle{}
\begin{verbatim}
... contents ...
\end{verbatim}
}
```
Fragile Environments & Hyperlinks

Fragile Environments

You **CANNOT** use `verbatim` without specifying it in the frame `options`:

```latex
\frame[containsverbatim]{
  \frametitle{}
  \begin{verbatim}
  ... contents ...
  \end{verbatim}
}
```

Hyperlinks & Buttons:

You can create **buttons** to jump around your talk:

- You need to put a `label` on the slide: `\frame[label=MyVerbatim]{` OR, `\label{theorem1}`

- To create the button:

```latex
\usepackage{hyperref}
\frame{
  \hyperlink{theorem1}{\beamergotobutton{Jump to Theorem \#1}}
  \hypertarget{theorem1}{}
}
```
Other useful things:

- Drawing diagrams
  - `xypic`: draws the diagrams I showed at beginning
  - the LaTeX `picture` environment
  - `pstricks`: can’t use `pdflatex` with this

- Logo in the footer:
  - put `\logo{name}` in preamble
  - puts logo in bottom right corner

- References
  - Google: if you think Beamer should be able to do it, Google it.