Introduction to Beamer

T.Dultuya

Department of Applied Mathematics
School of Engineering and Applied Sciences
National University of Mongolia

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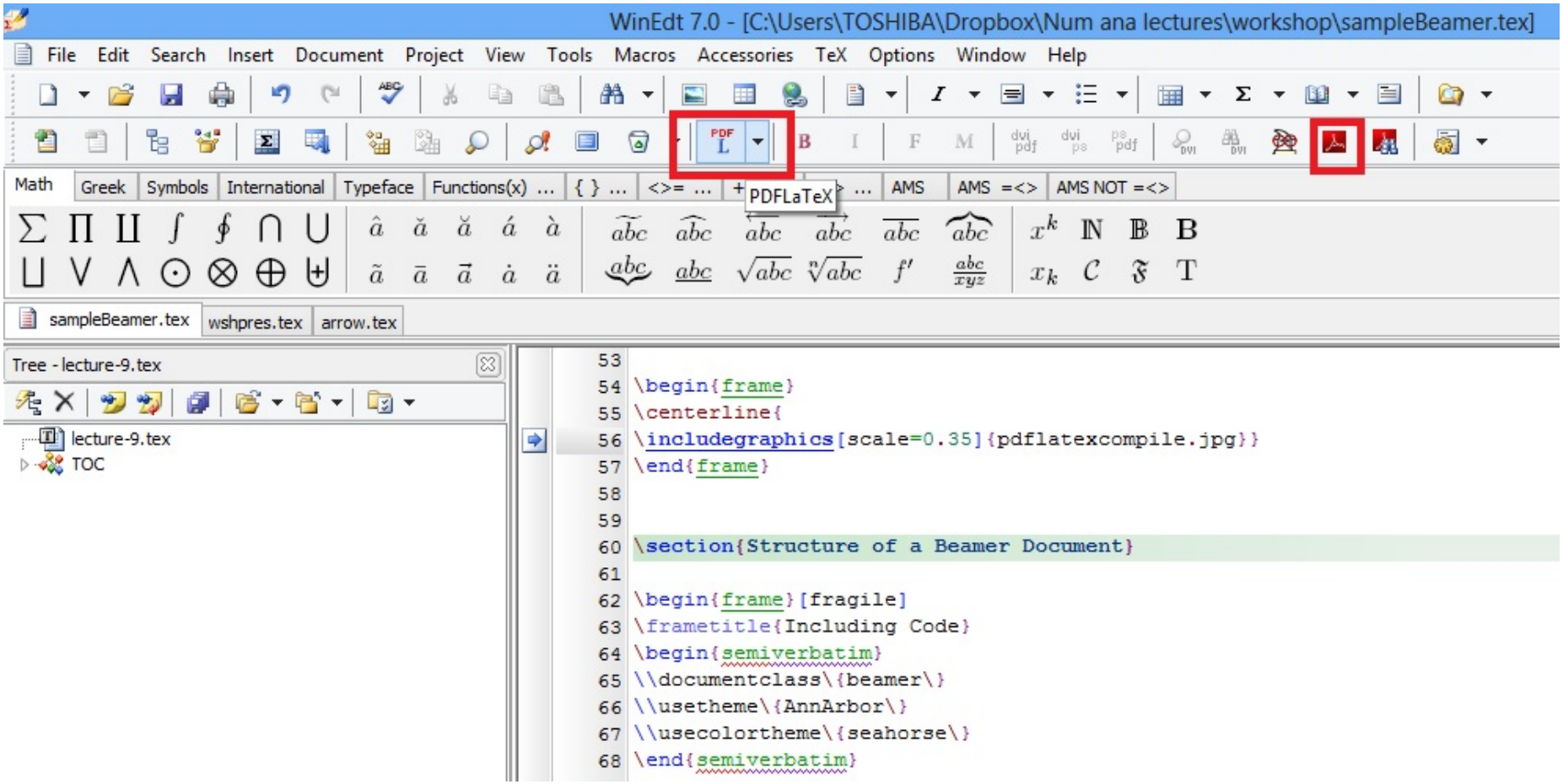
Contents

Contents

Beamer(Latex)

- **Beamer** is a LaTeX document class for creating slides 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

Creating a PDF file



Contents

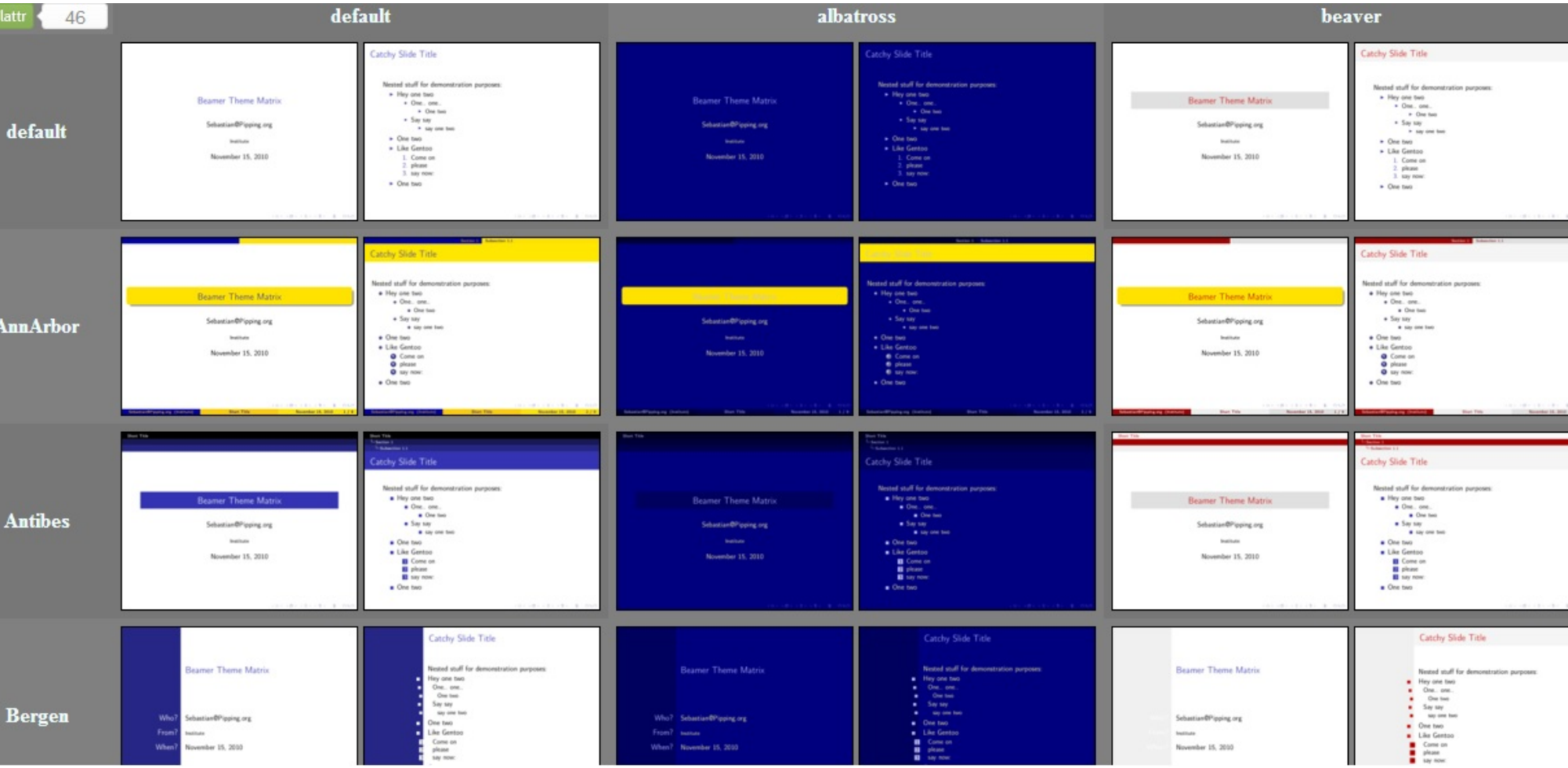
Document class and theme types

```
\documentclass{beamer}
\usetheme{AnnArbor}
\usecolortheme{seahorse}
\begin{document}

\end{document}
```

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

Beamer matrix



Beamer matrix

http://deic.uab.es/~iblanes/beamer_gallery/individual/Berkeley-whale-structurebold.html

https://www.hartwork.org/beamer-theme-matrix/

http://www.rennes.enst-bretagne.fr/~gbertran/pages/tutorials_latex.html

Packages

```
\usepackage[T2A]{fontenc}
\usepackage[utf8]{inputenc}
\usepackage[english,mongolian]{babel}
\usepackage[mongolian]{babel}
\usepackage{amsmath,amsthm}
\usepackage{multimedia}
\usepackage{tikz}
\usetikzlibrary{arrows,shapes}
```

Defining a title page

```
\title{Thesis title}
\author{Your Name \ Advisor: Prof. Name of advisor}
\institute{Department \
                  University\
                  }
\date{\today}
```

Structuring

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

Contents

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}
```

Contents

Contents

Contents

Single slide

A single slide is defined as follows:

```
\begin{frame}
\frametitle{title}
\framesubtitle{subtitle}
content in standard LaTeX notion
\end{frame}
```

Contents

Definitions

Definition 1 (Definition title)

Here is definition.

```
\begin{definition}[Definition title]
Here is definition.
\end{definition}
```

Definitions

Definition 1 (Definition title)

Here is definition.

```
\begin{definition}[Definition title]
Here is definition.
\end{definition}
```

Тодорхойлолт 3.1 (Definition title)

Here is definition.

```
\begin{defn}[Definition title]
Here is definition.
\end{defn}
```

Theorems

Theorem 2 (Theorem title)

Here is theorem.

```
\begin{theorem}[Theorem title]
Here is theorem.
\end{theorem}
```

Theorems

Theorem 2 (Theorem title)

Here is theorem.

```
\begin{theorem}[Theorem title]
Here is theorem.
\end{theorem}
```

Теорем 3.1 (Theorem title)

Here is theorem.

```
\begin{thm}[Theorem title]
Here is theorem.
\end{thm}
```

Examples

Example 3

$f(x) = \sqrt[3]{e^x - 1 - x - \frac{x^2}{2}}$ бол $f'(0) = ?$

```
\begin{example}
$f(x)=\sqrt\[3]{e^x-1-x-\displaystyle\frac{x^2}{2}}$
бол $f'(0)=?$
\end{example}
```

Examples

Example 3

$f(x)=\sqrt[3]{e^x-1-x-\frac{x^2}{2}}$ бол $f'(0)=?$

```
\begin{example}
$f(x)=\sqrt[3]{e^x-1-x-\displaystyle\frac{x^2}{2}}$
бол $f'(0)=?$
\end{example}
```

Жишээ 3.1

$f(x)=\sqrt[3]{e^x-1-x-\frac{x^2}{2}}$ *бол* $f'(0)=?$

Splitting a slide into columns

The line you are reading goes all the way across the slide. From the left margin to the right margin. Now we are going the split the slide into two columns.

Here is the first column. We put an itemized list in it.

- This is an item
- This is another item
- Yet another item

Here is the second column. We will put a picture in it.

Columns

```
\begin{columns}
  \begin{column}{0.5\textwidth}
   Here is the first column. We put an itemized list in it.
    \begin{itemize}
      \item This is an item
      \item This is another item
      \item Yet another item
    \end{itemize}
  \end{column}
  \begin{column}{0.3\textwidth}
   Here is the second column. We will put a picture in it.
   \centerline{\includegraphics[width=0.6\textwidth]
   {logo_web1.jpg}}
  \end{column}
\end{columns}
```

Columns

Column 1 Header

Column 1 Body Text

Column 2 Header

Column 2 Body Text

Code:

```
\begin{columns}[t]
\column{.5\textwidth}
\begin{block}{Column 1 Header}
Column 1 Body Text
\end{block}
\column{.5\textwidth}
\begin{block}{Column 2 Header}
Column 2 Body Text
\end{block}
\end{columns}
```

Itemize with pause

```
\begin{itemize}
      \item This is an item
      \pause
      \item This is another item
      \pause
      \item Yet another item
\end{itemize}
```

Itemize with pause

```
\begin{itemize}
      \item This is an item
      \pause
      \item This is another item
      \pause
      \item Yet another item
\end{itemize}
```

- This is an item

Itemize with pause

```
\begin{itemize}
      \item This is an item
      \pause
      \item This is another item
      \pause
      \item Yet another item
\end{itemize}
```

- This is an item
- This is another item

Itemize with pause

```
\begin{itemize}
      \item This is an item
      \pause
      \item This is another item
      \pause
      \item Yet another item
\end{itemize}
```

- This is an item
- This is another item
- Yet another item

Another Way to Create Pauses

- No external programs needed.

Another Way to Create Pauses

- Easy overlays.
- No external programs needed.

Code:

```
\begin{itemize}
\item <3-> Normal LaTeX class.
\item <2-> Easy overlays.
\item <1-> No external programs needed.
\end{itemize}
```

Another Way to Create Pauses

- Normal LaTeXclass.
- Easy overlays.
- No external programs needed.

Code:

```
\begin{itemize}
\item <3-> Normal LaTeX class.
\item <2-> Easy overlays.
\item <1-> No external programs needed.
\end{itemize}
```

Enumerate

1. First argument

```
\begin{enumerate}[<+-| alert@+>]
\item First argument
\item Second argument
\item Third argument
\item Fourth argument
\end{enumerate}
```

Enumerate

1. First argument
2. Second argument

```
\begin{enumerate}[<+-| alert@+>]
\item First argument
\item Second argument
\item Third argument
\item Fourth argument
\end{enumerate}
```

Enumerate

1. First argument
2. Second argument
3. Third argument

```
\begin{enumerate}[<+-| alert@+>]
\item First argument
\item Second argument
\item Third argument
\item Fourth argument
\end{enumerate}
```

Enumerate

1. First argument
2. Second argument
3. Third argument
4. Fourth argument

```
\begin{enumerate}[<+-| alert@+>]
\item First argument
\item Second argument
\item Third argument
\item Fourth argument
\end{enumerate}
```

Table

Хүснэгт: Example of table

Ice Cream Store	Location	How to Get There

Table

Хүснэгт: Example of table

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

Table

Хүснэгт: Example of table

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

Table

Хүснэгт: Example of table

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

Table

Хүснэгт: Example of table

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

Table

Code:

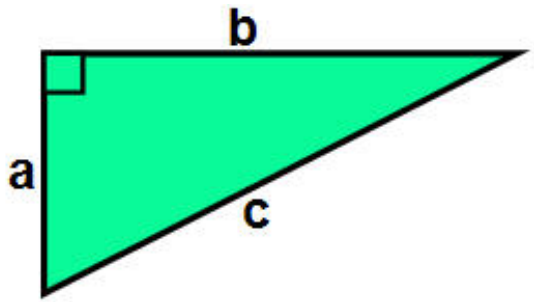
```
\begin{table}[bt]
\caption{Example of table}
\begin{tabular}{|c|c|c|} \hline
\textbf{Ice Cream Store} & \textbf{Location}
& \textbf{How to Get There} \\ \hline
\uncover<2->{Toscanini's} & \uncover<2->{Central Square}
& \uncover<2->{Just walk!} \\
\uncover<3->{Herrell's} & \uncover<3->{Harvard Square}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

Footnote

This[I] is the first footnote, and this[II] is the second. The end.[††]

[I] The first.
[II] The second.
[††] At last!

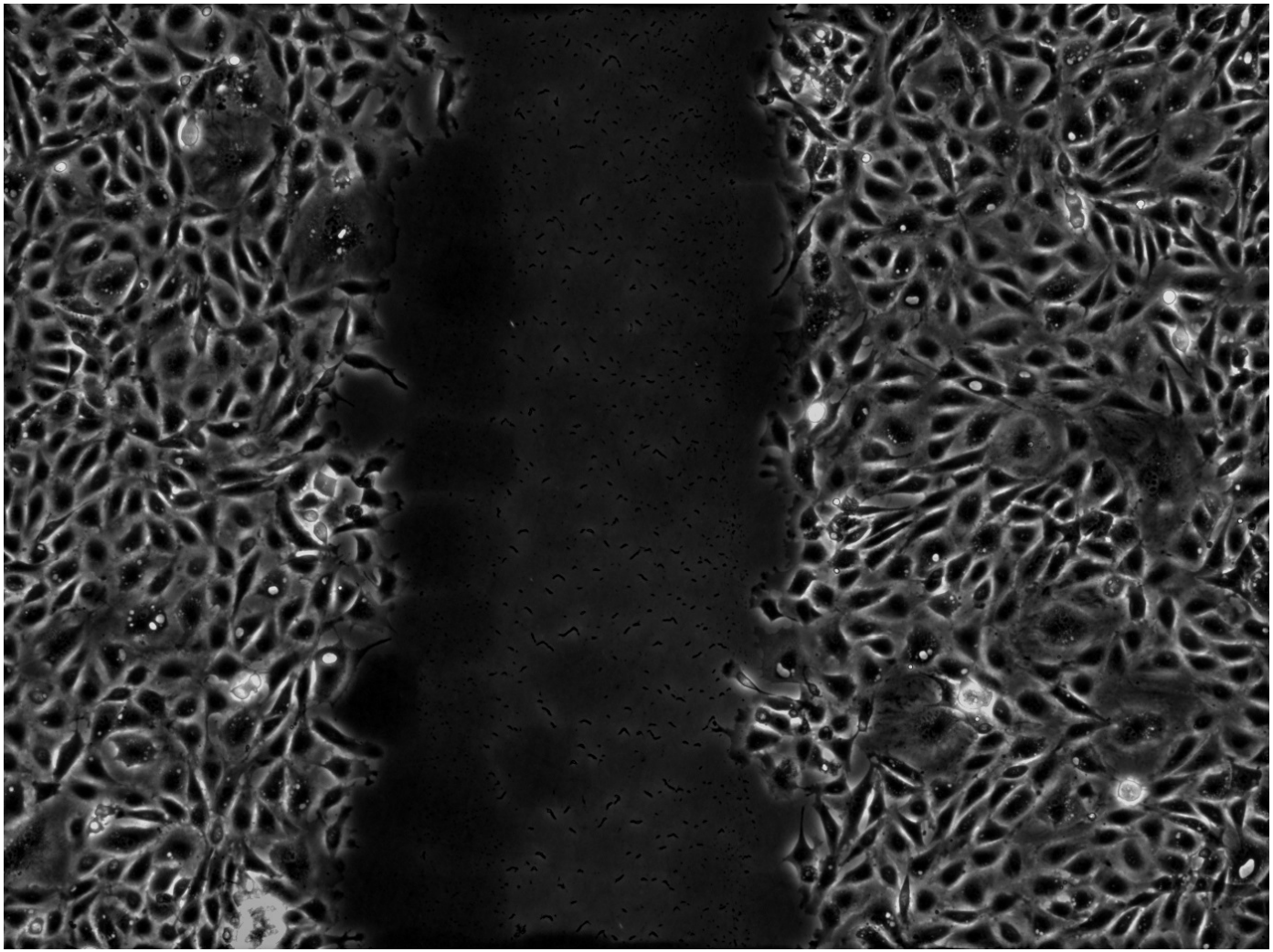
Footnote



By Pythagorean theorem[iii] $a = \sqrt{c^2 - b^2}$.

[iii] $a^2 + b^2 = c^2$

Movie



Rigid body dynamics

- Coriolis acceleration

$$\vec{a}_p = \vec{a}_o + \frac{{}^b d^2}{dt^2}\vec{r} + 2\vec{\omega}_{ib} \times \frac{{}^b d}{dt}\vec{r} + \vec{\alpha}_{ib} \times \vec{r} + \vec{\omega}_{ib} \times (\vec{\omega}_{ib} \times \vec{r})$$

Rigid body dynamics

- Coriolis acceleration
- Transversal acceleration

$$\vec{a}_p = \vec{a}_o + \frac{{}^b d^2}{dt^2}\vec{r} + 2\vec{\omega}_{ib} \times \frac{{}^b d}{dt}\vec{r} + \vec{\alpha}_{ib} \times \vec{r} + \vec{\omega}_{ib} \times (\vec{\omega}_{ib} \times \vec{r})$$

Rigid body dynamics

- Coriolis acceleration
- Transversal acceleration
- Centripetal acceleration

$$\vec{a}_p = \vec{a}_o + \frac{{}^b d^2}{dt^2}\vec{r} + 2\vec{\omega}_{ib} \times \frac{{}^b d}{dt}\vec{r} + \vec{\alpha}_{ib} \times \vec{r} + \vec{\omega}_{ib} \times (\vec{\omega}_{ib} \times \vec{r})$$

Formula or Equation

Example 4

$$\int_{-\infty}^{\infty} e^{-x^2}\,dx = \sqrt{\pi}$$

Code:

```
$$ \int_{-\infty}^\infty
e^{-x^2} \, dx = \sqrt{\pi}$$
```

Formula or Equation

Example 5

$$\begin{cases} -\Delta v &= \chi_{\overline{B}} & \forall x \in \Omega \\ v &= 0 & \forall x \in \partial\Omega. \end{cases}$$

Code:

```
$$
\left\{
\begin{array}{rlll}
-\Delta v & = \chi_{\overline B} & & \forall
x \in \Omega\\
v & =0& & \forall x \in \partial\Omega.
\end{array}
\right.
$$
```

Formula or Equation

Example 6

$$2x^2 + 3(x-1)(x-2) = 2x^2 + 3(x^2 - 3x + 2)$$

Formula or Equation

Example 6

$$\begin{aligned} 2x^2 + 3(x-1)(x-2) &= 2x^2 + 3(x^2 - 3x + 2) \\ &= 2x^2 + 3x^2 - 9x + 6 \end{aligned}$$

Formula or Equation

Example 6

$$\begin{aligned} 2x^2 + 3(x-1)(x-2) &= 2x^2 + 3(x^2 - 3x + 2) \\ &= 2x^2 + 3x^2 - 9x + 6 \\ &= 5x^2 - 9x + 6 \end{aligned}$$

Code:

```
\begin{eqnarray*}
2x^2 + 3(x-1)(x-2)&=&2x^2 + 3(x^2-3x+2)\\
\pause &=& 2x^2 + 3x^2 - 9x + 6\\
\pause &=& 5x^2 - 9x + 6
\end{eqnarray*}
```

Case definitions

Example 7

Used when a definition have two or more cases. Use the case statement.

$$f(x) = \begin{cases} 1 & -1 \le x < 0 \\ \frac{1}{2} & x = 0 \\ 1 - x^2 & \text{otherwise} \end{cases}$$

The code for the above example:

```
\[ f(x) =
\begin{cases}
1 & -1 \le x < 0 \\
\frac{1}{2} & x = 0 \\
1 - x^2 & \mbox{otherwise}
\end{cases}\]
```


Leslie Lamport, *LaTeX: a document preparation system*. Addison Wesley, Massachusetts, 2nd edition, 1994.


Andrew Mertz, *Beamer by Example*. William Slough, Proceedings of the Practical TEX 2005 Conference, TUGboat, Volume 26 (2005).


Michael Downes, *Short Math Guide for LaTeX*. American Mathematical Society, version-1.09, 2002.


`http://deic.uab.es/~iblanes/beamer_gallery/individual/Berkeley-whale-structurebold.html`


`https://www.hartwork.org/beamer-theme-matrix/`


`NUM-LaTeX https://www.facebook.com/groups/1495079384045990/`

THANK YOU FOR YOUR ATTENTION