- What is LaTeX?
- Why is it cool?

What is LaTeX?

Google it:

LaTeX is a high-quality typesetting system; it includes features designed for the production of technical and scientific documentation. **LaTeX** is the de facto standard for the communication and publication of scientific documents.

LaTeX – A document preparation system
www.latex-project.org/

Myself: LaTeX ~ Word + Power Point

Why is it cool?

Please see what you can do with LaTeX?

No mouse to write any complex equations

Example [1]:

Symbol	Script
A and α	`A` and `\alpha`
B and β	`B` and `\beta`
Γ and γ	`\Gamma` and `\gamma`
Δ and δ	`\Delta` and `\delta`
E, ϵ and ε	`E`, `\epsilon` and `\varepsilon`
Z and ζ	`Z` and `\zeta`
H and η	`H` and `\eta`
Θ, θ and ϑ	`\Theta`, `\theta` and `\vartheta`
I and ι	`I` and `\iota`
K, κ and $\varkappa$	`K`, `\kappa` and `\varkappa`
Λ and λ	`\Lambda` and `\lambda`
M and μ	`M` and `\mu`

[1] Source: http://en.wikibooks.org/wiki/LaTeX/Mathematics

How can I write this sentence in LaTeX?

$scoreP_j^R = \sum_{i=1}^{M_g} \sum_{k=1}^{N_{breaks}} w_k^R * f(x_k)$ is so easy to write in LaTeX. Please don't use Word to write such an equation.

Just type:

```
scoreP_j^{R} = \sum\limit_{i = 1}^{M_{g}}\sum\limits_{k=1}^{N_{breaks}} w_k^{R}*f(x_k) is easy
to write in LaTeX. Please don't use Word to write such an equation.
```

Adjust picture sizes

Example: insert a picture named RStudioPicture.png

SMALL?
Just type

```
\includegraphics[width = 1cm, height = 1cm]{RStudioPicture.png}
```

Adjust picture sizes

Example: insert a picture named RStudioPicture.png

LARGE?

Just type

```
\includegraphics[width = 3cm, height = 2.5cm]{RStudioPicture.png}
```

Adjust your table

SMALL columns

```
\begin{tabular}{|p{1cm}|p{1cm}|}
\hline
a & b\\
\hline
b & c\\
\hline
\end{tabular}
```

a	b
b	c

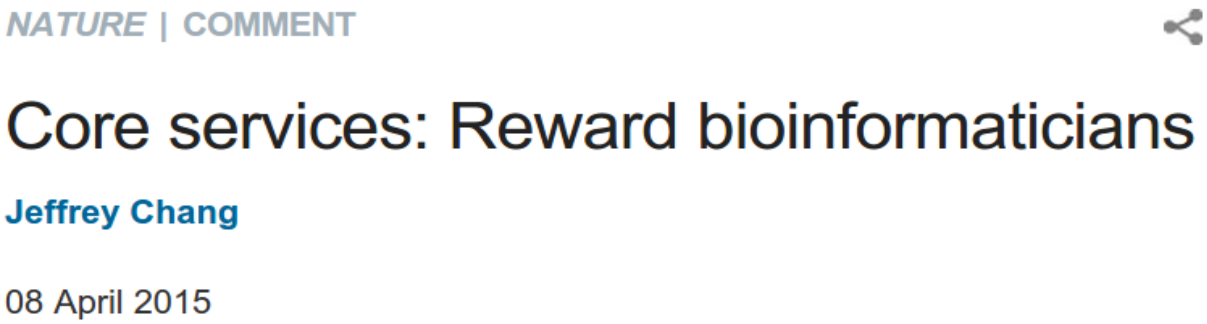
LARGE and more columns, rows

```
\begin{tabular}{|p{2cm}|p{4cm}||p{2cm}|}
\hline
a & b & b1 \\
\hline
b & c & c1\\
\hline
d & d1 & \includegraphics[width = 0.3cm, height = 0.3cm]{SmileFace.png}  \\
\hline
\end{tabular}
```

a	b	b1
b	c	c1
d	d1	

Citation

Want to cite this paper?



Just type

```
\citet{chang2015core} published a cool paper.

In 2015, \citeauthor{chang2015core} published a cool paper.
```

And see this

Chang (2015) published a cool paper.
In 2015, Chang published a cool paper.

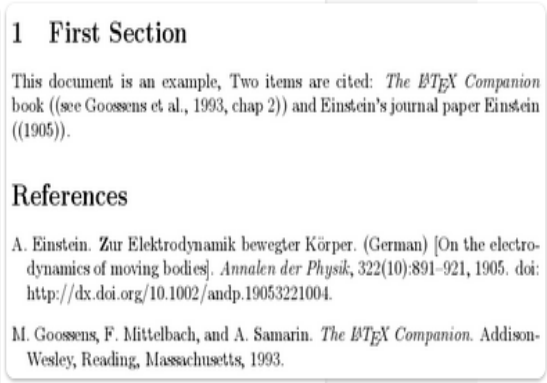
***chang2015core is a short name.**

Citation: Natbib package

Natbib citation styles

Natbib uses the citation style associated with the corresponding bibliography style if no specific citation commands are declared. There are some additional commands to control some punctuation parameters. See the example below:

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\usepackage[english]{babel}

%Import the natbib package and sets a bibliography  and
citation styles
\usepackage{natbib}
\bibliographystyle{abbrvnat}
\setcitestyle{authoryear,open={((},close={))}}


\begin{document}

\section{First Section}
This document is an example, Two items are cited:
\textit{The \LaTeX\ Companion} book \cite[see][chap 2]
{latexcompanion} and Einstein's journal paper
\cite{einstein}.


%Imports the bibliography file "sample.bib"
\bibliography{sample}

\end{document}
```



1 First Section

This document is an example, Two items are cited: *The LaTeX Companion* book ((see Goossens et al., 1993, chap 2)) and Einstein's journal paper Einstein ((1905)).

References

A. Einstein. Zur Elektrodynamik bewegter Körper. (German) [On the electrodynamics of moving bodies]. *Annalen der Physik*, 322(10):891–921, 1905. doi: http://dx.doi.org/10.1002/andp.19053221004.

M. Goossens, F. Mittelbach, and A. Samarin. *The LaTeX Companion*. Addison-Wesley, Reading, Massachusetts, 1993.

Thesis

Great!

Don't want to spend time to adjust tables + pictures + citations + formats ...

=> please just use LaTeX.

Otago LaTeXthesis package can be downloaded from:
`http://www.cs.otago.ac.nz/research/systems/resources.html`

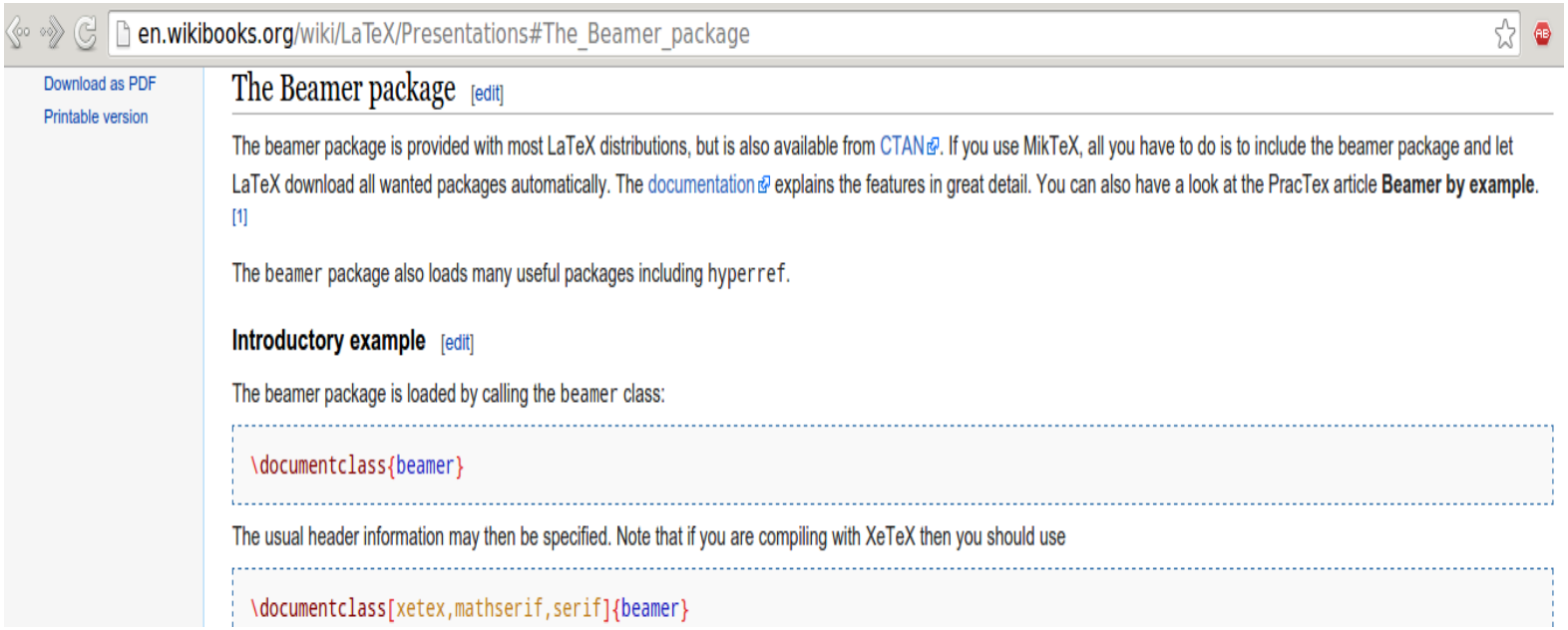
Presentation

LaTeXis used to make this presentation.

But how?

Presentation

The magician "The Beamer package": you can customize (or copy) different themes
=> I usually download a theme and adjust it.



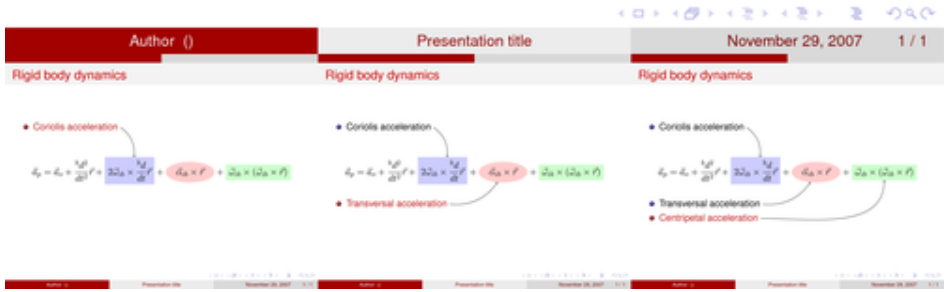
Beamer example

Rigid body dynamics

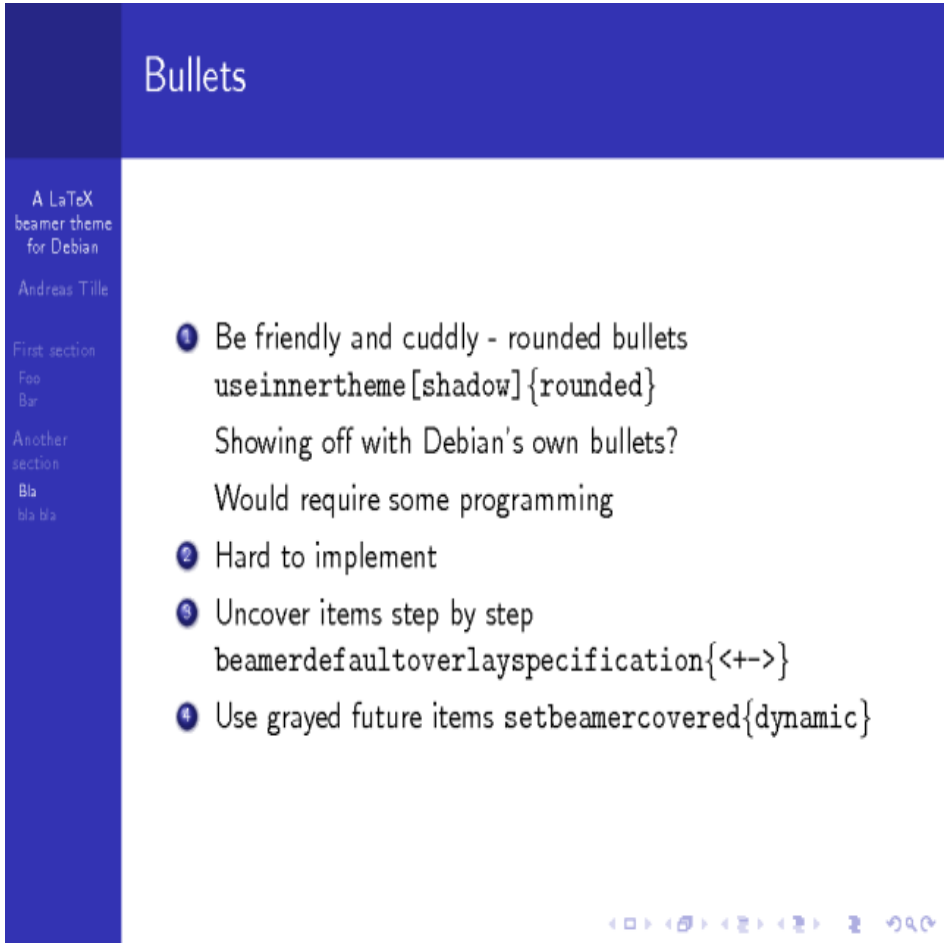
- Coriolis acceleration

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

- Transversal acceleration
- Centripetal acceleration

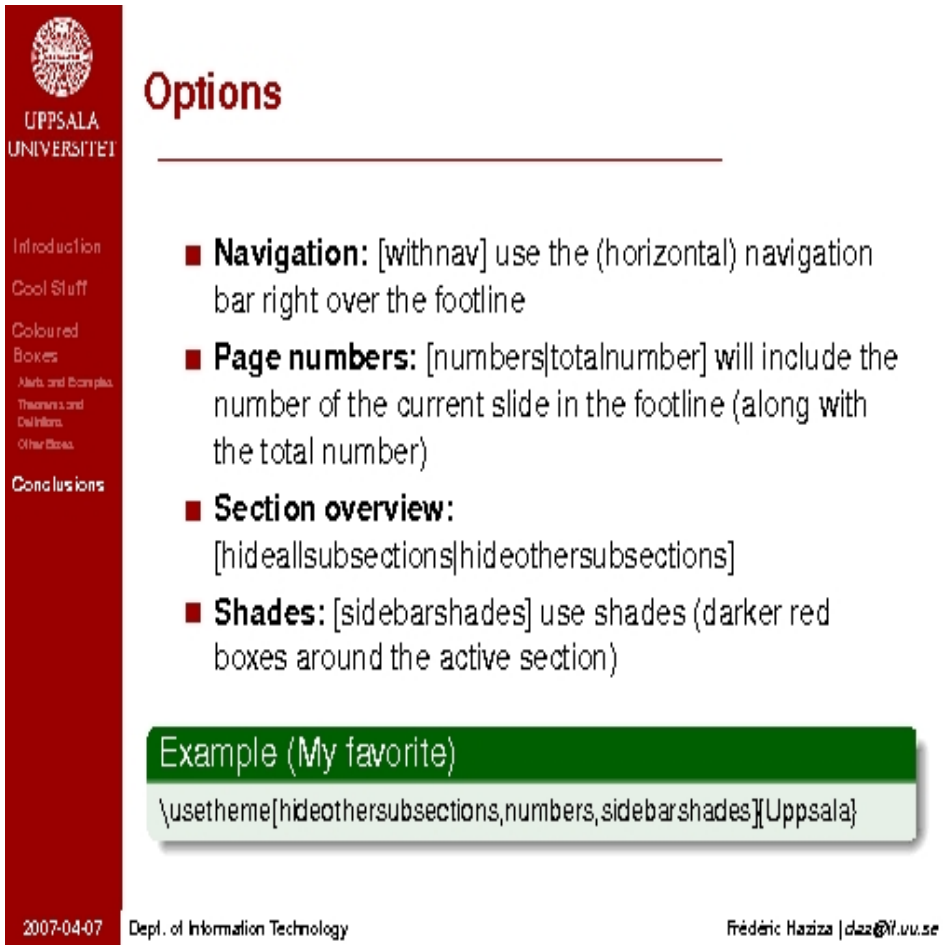


Beamer example



Beamer example

Beamer example



Open emacs/vim/word...and type it, then go to terminal to compile it with *pdflatex* and *bibtex*.

```
\documentclass[12pt]{article}
\usepackage{graphicx}
\usepackage{natbib}
\bibliographystyle{abbrvnat}
\setcitestyle{authoryear,open={(},close={)}}


\begin{document}

The lab suggested that I should give a short introduction about \LaTeX.
I don't know what I should present, so I have decided to introduce:

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\section{Equation}

You can type \begin{verbatim}\alpha \end{verbatim} to obtain $\alpha$.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\section{Table/Picture}

There is a table here.

\begin{tabular}{|p{3cm}|p{6cm}|}
\hline
A1 & A2\\
\hline
Ha & \includegraphics[width = 2cm, height = 2cm]{SmileFace} \\
\hline
\end{tabular}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

\section{Citation}

Here, I use a paper of \cite{chang2015core}.

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\section{Thesis}

Here, I suggest that people should use the format of Otago University.

\bibliography{bibLabMik}
\end{document}
```

The lab suggested that I should give a short introduction about LaTeX. I don't know what I should present, so I have decided to introduce:

1 Equation

You can type

\alpha

to obtain α.

2 Table/Picture

There is a table here.

A1	A2
Ha	

3 Citation

Here, I use a paper of Chang (2015).

4 Thesis

Here, I suggest that people should use the format of Otago University.

References

J. Chang. Core services: Reward bioinformaticians. *Nature*, 520(7546):151–152, 2015.

Discussion

You can use LaTeXto:

1. write your thesis/proposal/manual.
2. make your presentation.

However, you have to work with biologists, so MUST use Word to write papers.

J. Chang. Core services: Reward bioinformaticians. *Nature*, 520(7546):151–152, 2015.