Presentations in LaTeX with Beamer

Sebastiano Tronto

2021-03-26

Why presentation with LaTeX?

Pros:

- Easy to include formulas and theorems
- Portability: `pdf` = **portable** document format
- Very fast to get "good enough" results (subjective)

Cons:

- Advanced animations not possible with pdf
- Lack of other presentation-specific features

UNIVERSITÉ DU LUXEMBOURG

Structure of a Beamer document

```
\documentclass[11pt]{beamer}
\usetheme{Berkeley} % Many templates available

\usepackage[utf8]{inputenc}
\usepackage{amsmath}
\usepackage{amsfonts}
\usepackage{amssymb}

\author[S. Tronto]{Sebastiano Tronto}
\title[Short title]{Full title of the presentation}

\logo{\includegraphics[scale=0.065]{unilu.jpg}}
%\date{2999-12-31}

\begin{document}

\begin{frame}
\titlepage
\end{frame}

\section[Short name]{A section with a long name}
\begin{frame}{First slide}
stuff here
\end{frame}

\end{document}
```

UNIVERSITÉ DU LUXEMBOURG

The `frame` environment

`\begin{frame}[options]{Title} ... \end{frame}`

Useful options:

- `plain`: no bars on bottom or side
- `shrink`: content is shrunk to fit in the slide
- `fragile`: when you have `tikzpicture`, `listings` or similar

Basic animations

- \pause for a simple break
- \only<start-(end)>{*stuff*} to show *stuff* only on some slides
  Shortcut for lists: \item<...> or \begin{itemize}[<+->]
- Optional: \setbeamercovered{transparent} (see end of slides)
- \uncover<...> does not take space when invisible

uni.lu
UNIVERSITÉ DU LUXEMBOURG

Theorems and lists

Theorem

This is a Theorem

Proof.

With proof □

- `theorem`, `proof` and `definition` already included with beamer.
- Define new theorems as usual (they get a box automatically)

Custom blocks

A custom block, with ugly colors

```
{
    \setbeamercolor{block title}{fg=blue,bg=green}
    \setbeamercolor{block body}{fg=black,bg=pink!50}

    \begin{block}{A custom block, with ugly colors}
        ...
    \end{block}
}
```

UNIVERSITÉ DU LUXEMBOURG

Multiple columns

```
\begin{columns}
    \column{width}
    (stuff)
    \column{width}
    (more stuff)
        ⋮
\end{columns}
```

- *width* is a length (example: `0.7\textwidth`)
- Example: picture on the left, text on the right
- Not specific to Beamer
- Alternative: `tabular`

Some advice

- Do not prepare too many slides (1-2 minutes per slide)
- Do not write too much in each slide (split if necessary)
- Pictures and `itemizes` are great, sentences are not
- Animations are ok (but are they worth the effort?)

UNIVERSITÉ DU LUXEMBOURG

Examples

Three examples will follow:

- A horrible slide
- A better slide with the same content
- A better better slide that took a little more time to write

UNIVERSITÉ DU LUXEMBOURG

Diophantine equations (bad)

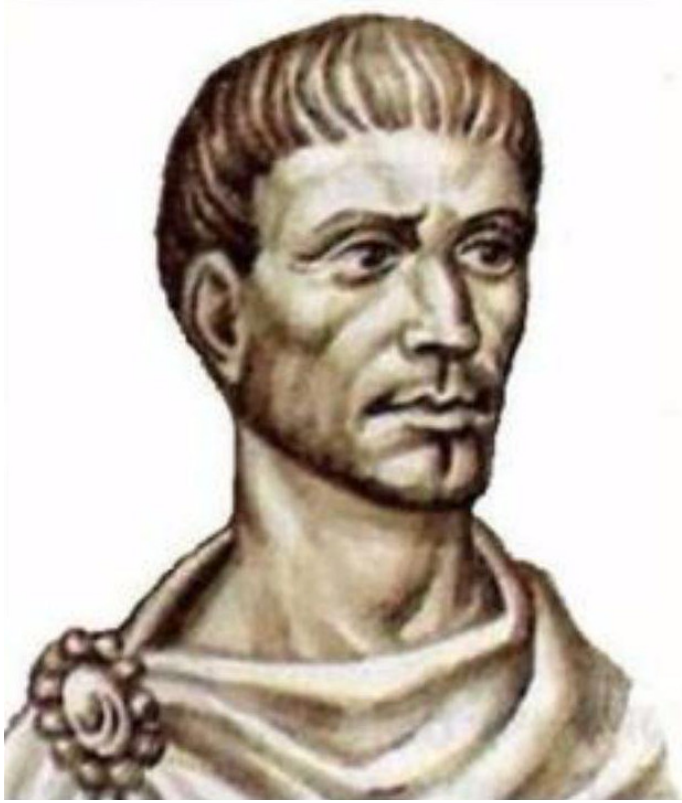
Diophantine equations are a very old problem, dating back to Diophantus of Alexandria (III century A.D.).
Despite this, they are still today a very hard problem, and there is no general method or algorithm to solve them.
A notable example is *Fermat's Last Theorem*, stated for the first time in 1637 but proved to be true only in 1995, after more than 350 years!

Diophantine Equations (better)

- Very old problem
- Very simple formulation, but very hard to solve!
- "Fermat's Last Theorem": stated in 1637 - proved in 1995

UNIVERSITÉ DU LUXEMBOURG

Diophantine Equations (better better)

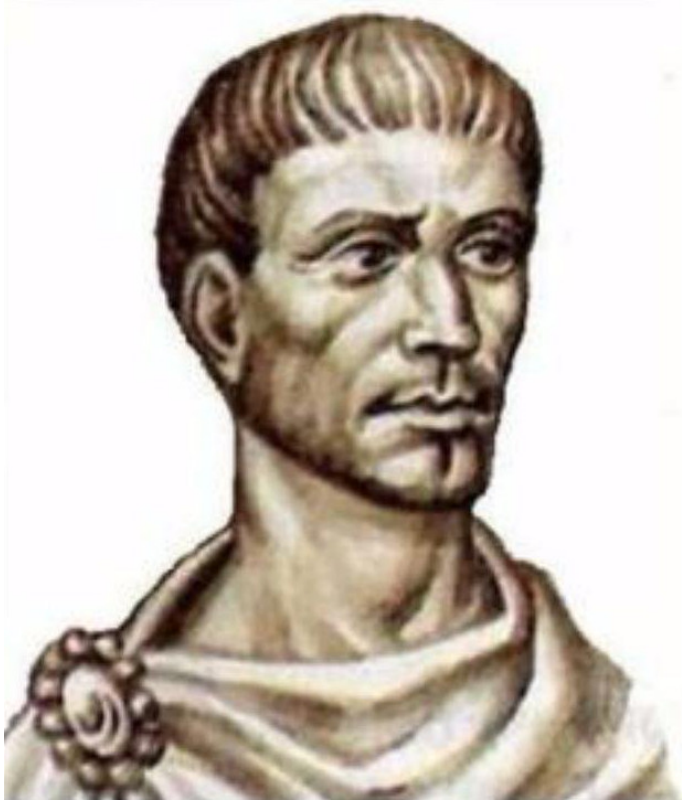


Diophantus of Alexandria
(III century A.D.)

- Very old problem
- Very simple formulation, but very hard to solve!
- *Fermat's Last Theorem*: stated in 1637 - proved in 1995

UNIVERSITÉ DU LUXEMBOURG

Diophantine Equations (better better)

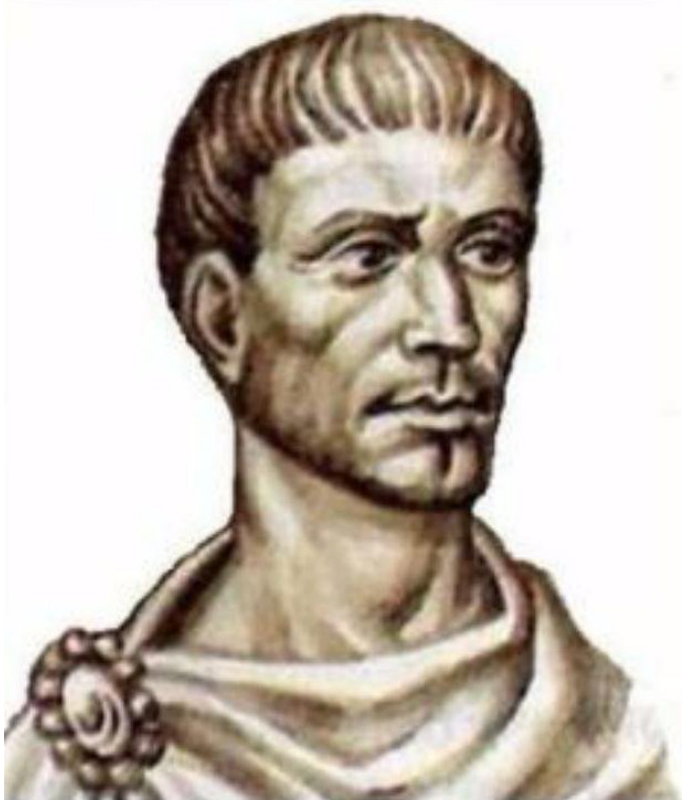


Diophantus of Alexandria
(III century A.D.)

- Very old problem
- Very simple formulation, but very hard to solve!
- *Fermat's Last Theorem*: stated in 1637 - proved in 1995

UNIVERSITÉ DU LUXEMBOURG

Diophantine Equations (better better)



Diophantus of Alexandria
(III century A.D.)

- Very old problem
- Very simple formulation, but very hard to solve!
- *Fermat's Last Theorem*: stated in 1637 - proved in 1995

UNIVERSITÉ DU LUXEMBOURG