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samcarter, Joseph Wright

Abstract

The beamer class is used by many users all around the world to create slides for their presentations. This article will highlight some changes and new features, added over the last few years, which might be interesting to know for beamer users.

1 Introduction

The beamer class is the most widely used class to produce slides for presentations in LaTeX. It was first created by Till Tantau in 2003 with a lot of — for that time — revolutionary features. Since then the class has steadily evolved and gained even more features, while at the same time accumulating a very large user base. Some of these users have been using beamer for many years.

Thus, at the current point in beamer's life cycle, we maintainers focus our efforts on stability. We fix bugs and generally keep things from crumbling in the event of changes in the LaTeX kernel or one of the other packages that beamer depends on. Nevertheless, a couple of smaller changes have been made over the last few years which aim to improve the usability of the class for its users. In this article we would like to highlight some of the changes which we think are useful for beamer users to know about.

The section headings in the following will all include a version number at the right hand side. This is the version in which the respective change was introduced to the beamer class.

2 Transparent shadows (v3.60/64/70)

The first change is mostly cosmetic: beamer now has transparent shadows for blocks, headlines, etc. Previously, the shadow effect was created by adding a colour gradient from dark to the background colour of the frame (normally white). On frames with a background image, this resulted in strange looking halos, as can be seen in the top panel of Figure 1.

The first step to fixing this was a pull request by Andrey Paramonov for beamer v3.51. While this worked great for most engines, it caused some problems for DVI-based compilation chains and thus was ultimately reverted in the next beamer version. With the help of Ulrike Fischer, transparent shadows were finally resuscitated in v3.60 and, after an additional 10 versions of tracking down non-transparent shadows of various elements, all shadows in beamer v3.70 should now finally be transparent.

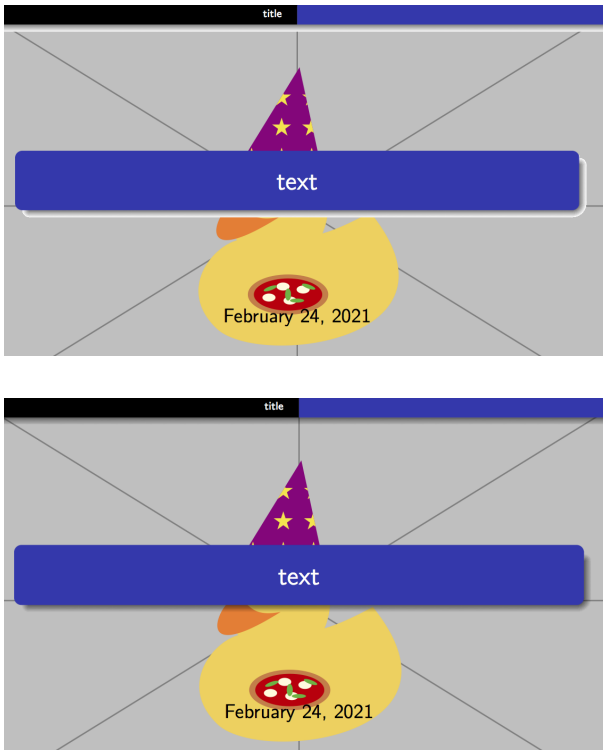

Figure 1: Comparison of non-transparent (top image) and transparent shadows (bottom image)

3 Aspect ratios (v3.65)

Surprisingly many different aspect ratios are used around the world. In the past, beamer only offered a limited set of available aspect ratios. Starting with beamer v3.65, beamer can calculate new aspect ratios on the fly. In addition to the existing options, the user can pass a two to four digit number to the `aspectratio` class option and beamer will calculate the frame geometry accordingly.

For two and four digit numbers, the number is split in the middle to obtain the width-to-height ratio of the frame; for three digit numbers, a landscape format is assumed and the number is split after the second digit:

- 2 digits: `aspectratio=23` as `2:3`
- 3 digits: `aspectratio=137` as `13:7` (always landscape orientation)
- 4 digits: `aspectratio=4310` as `43:10`

Internally, beamer uses a fixed frame height of 9.6 cm for all newly-calculated aspect ratios and calculates the frame width accordingly. The idea behind having a constant height and adjusting the width is that many presentations use rather short lines which typically don't fill the whole width of the page. Changing the width of the frame potentially allows

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the user to switch between aspect ratios without disturbing the layout too much.

4 New `onlytextwidth` class option (v3.65)

The beamer `columns` environment is very convenient to place content side-by-side on a frame. By default, however, the result will most likely have different margins than the surrounding text. Internally, beamer resets the left and right margins to zero within the `columns` environment and then distributes all the remaining space equally before, between, and after the columns. Unless one carefully calculates the column widths to account for this effect, the resulting margins will thus be different from the surrounding text (see Figure 2).

Default `columns` behaviour:

With the `onlytextwidth` option:

Figure 2: Visualisation of the effect of the `onlytextwidth` option on the `columns` environment.

One can change this locally by using one of the options `onlytextwidth` or `totalwidth=\textwidth` for the `columns` environment. Since beamer v3.65 it is possible to use the new `onlytextwidth` class option to change this behaviour for the whole presentation.

5 The new `s` frame option (v3.65)

Traditionally, beamer offered the `t`, `c` and `b` frame options to influence the vertical position of the frame content.

Erich Schubert contributed the new stretchable frame option `s`. In contrast to the existing options, the `s` frame option does not add any vertical fill at all to the frame. The user has to manually add stretchable material to the frame. This is a bit of extra work, but it allows spreading the content over the whole frame, from top to bottom.

Here's a minimal example of how the new frame option can be used:

```
\begin{frame}[s]
  Text at top
  \vfill
  Text at bottom
\end{frame}
```

6 Modular title page (v3.70)

Many users need to make small adjustments to the title page of their presentation, for example to add the name of their supervisor, the members of a thesis committee, or changing the order in which some of the information is displayed.

Such small changes often resulted in either redefining the whole title page template or tempted the user to resort to dirty hacks.

In version 3.70 of beamer the default title page template is no longer a big monolithic code block, but now uses several smaller templates:

- `title`
- `author`
- `institute`
- `date`
- `titlegraphic`

These templates can be adjusted individually without having to redefine the whole title page.

For example, adding the name of a supervisor below the author name now amounts to simply:

```
\addtobeamertemplate{author}
  {}{Supervisor: Name}
```

7 `page number in head/foot` template (v3.50)

A frequently asked question about beamer is how to change the format of the frame numbers in the foot line. The solution used to be a redefinition of the whole `footline` template.

In the same spirit as making the title page less monolithic, a new `page number in head/foot` template was introduced. Now users can change the appearance of the frame numbers with

```
\setbeamertemplate{page number in head/foot}
  [totalframenumber]
```

The predefined options for this template are

- `default`: the template is empty by default.
- `framenumber`: shows the current frame number.
- `totalframenumber`: shows the current frame number, as well as the total number of frames.
- `appendixframenumber`: similar to the previous, but with separate numbering in the appendix. This option was inspired by the package `appendixnumberbeamer` by Jérôme Lelong.[1]
- `pagenumber`: shows the current page number. The page number can differ from the frame number if overlays are used in the presentation.
- `totalpagenumber`: similar to the `pagenumber` option, but also shows the total number of pages.

[1] `ctan.org/pkg/appendixnumberbeamer`

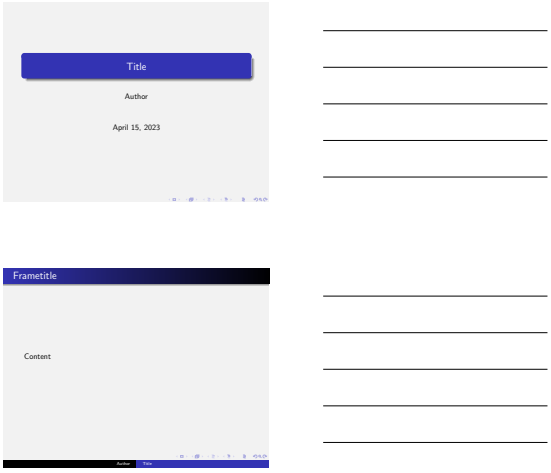

Figure 3: Slides (left) and the corresponding lined note pages (right)

8 Lined `note page` template (v3.64)

Inspired by the `handoutWithNotes` package,[2] beamer now has a `note page` template to add lined note pages to presentations. It can be used via:

```
\setbeamertemplate{note page}[lined]
```

The resulting note pages can be seen in Figure 3.

The user can also adjust the number of lines on the note pages, e.g. with

```
\setbeamertemplate{note page}[lined][5]
```

they will get five lines on the note pages.

9 `lastsection` option for ToC (v3.63)

Beamer already had the `firstsection` option for the table of contents. It allowed having unnumbered sections at the start of the table of contents, which can be useful e.g. for example for an unnumbered introduction.

To allow for unnumbered sections at the end of the table of contents, beamer now also has a `lastsection` option. This option specifies the number of the last numbered section (counted from the first numbered section).

10 New user facing macros (v3.65/70)

Sometimes users might want to know the current aspect ratio of their presentation; for instance, maybe they want to use different background images for the title page depending on the paper format. They can now use the new `\insertaspectratio` macro to access the current aspect ratio.

For users of the `sidebar` theme, two new public macros are available, `\beamersidebarwidth` and `\beamerheadheight`. They provide a way for users to access the value of lengths which were previously only available internally. The new macros are useful if users would like to add logos, etc., to their sidebar and scale them accordingly, or to correct for the asymmetric margins on plain frames with the `sidebar` theme.

11 Calculation of frame geometry (v3.70)

There was also a behind-the-scenes change to how beamer calculates the frame geometry (e.g. the space necessary for the head- and footlines). Previously, the frame geometry was calculated only once, at the start of the presentation. This made it difficult to change between different head- and footlines throughout the presentation. If a user needed a taller headline on their section pages, they had to be very careful to compensate for the additional space or the footline might have been lost.

Now beamer calculates the frame geometry at the start of every frame. This makes the compilation a tiny bit slower, but with much more powerful computers now compared to when beamer was first released in 2003, this change brings new opportunities for creating beamer themes.

12 Summary

The changes presented in this proceeding were cherry picked examples which might be particularly useful for users to know about. Beyond these, many more changes have been made to beamer. A full list of changes is available from the beamer change log[3] or from the CTAN announcements for each new version.[4]

◇ samcarter

◇ Joseph Wright
Northampton, United Kingdom
joseph dot wright (at)
morningstar2.co.uk

[2] `ctan.org/pkg/handoutwithnotes`

[3] `github.com/josephwright/beamer/blob/main/CHANGELOG.md`

[4] `ctan.org/ctan-ann/pkg/beamer`