Developer's Guide on SJTUBeamer [MIN]

Log Creative

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1 Preface

SJTUBeamer [MIN] is a presentation template based on beamer package in LaTeX, to fulfill the enthusiasm of those SJTU users to present their content nicely benefiting from the technology of TeX typesetting engine.

This is a Developer's Guide on SJTUBeamer [MIN] . The document is written in English because the operation in this guidance could be dangerous. Be careful when playing with those macros.

SJTUBeamer [MIN] — the minimal work set of SJTU VI

[MIN]	- *minimal*:	minimal work set of SJTU VI.
[MIN]	- *minimalism*:	designed in the style of minimalism.
[MIN]	- *minimum*:	minimum shapes to show your content.

2 Compliation

Most problems come from LaTeX compilation. The required packages are in the following list.

The detailed description is documented below.

pgfplots	tikz	xcolor
pgfplotstable	sansmath	tcolorbox
ctex	biblatex	beamer

2.1 MiKTEX

All required packages will be automatically installed if you are using MiKTEX[**?**]. And if you want to use the `latexmk` command, please install Perl[**?**] first. And the compilation command for SJTUBeamer [MIN] is as follows:

```
latexmk -pdf main -interaction=nonstopmode
```

2.2 TEX Live

Since some packages are not default installed in the full release of TEX Live, you have to install the packages manually.

On Ubuntu, you could install `pgf` and `xcolor` and other drawing packages through the following command[**?**]:

```
sudo apt install texlive-pictures
```

To typeset Chinese characters, you would better use `CJKutf8` package (in SJTUBeamer [MIN], set `[cjk=true]`), since it is compatible with all platforms and multiple language support. Surround `CJK` environment to make it work and remember to move all the Unicode characters in the permeable to the `CJK` environment[**?**]:

```
\begin{document}
\begin{CJK}{UTF8}{gbsn}
    \institute[]{}
    \title{}
    \subtitle{}
    \author{}
    \date{}
    % your content here ...
\end{CJK}
\end{document}
```

However, if you stick into `ctex`, you can install through `tlmgr`. If that works, then we call it a day.

```
sudo tlmgr install ctex
```

Sometimes, you installed an old TEX Live, and you have to upgrade the `tlmgr` for the new version. And the process could be very buggy, since the following warning may be shown:

```
unexpected return value from verify_checksum: -5
```

and to upgrade the `tlmgr` is painful on Ubuntu. You should add the following content to `/etc/profile/`, which will add the newest path when the system is booting up[**?**]:

```
export PATH=/usr/local/texlive/2021/bin/x86_64-linux:
/usr/local/texlive/:$PATH
```

Reboot your computer if necessary. Then the compile system will be moved to the newer version of TEX Live. Try to install the corresponding packages through the GUI interface of `tlmgr`:

```
sudo tlmgr update --self
sudo tlmgr gui
```

And if you encountered that

```
Critical Package ctex Error: CTeX fontset 'fandol' is
unavailable in current(ctex) mode.
```

You have to modify your compiling program from pdfLATEX to XeLATEX by adding the following magic command on the first line:

```
% !TeX TS-program = xelatex
```

2.3 Boost Up

However, it has been tested that the compilation on SJTUBeamer [MIN] is slow. Since the complex patterns have to be rendered in vector shapes and the bibliography requires multiple times of compilation, the time could be wasted on some repetitive works.

This scenario could be improved by enable `[pattern=none]` option on SJTUBeamer [MIN] and enable `[draft]` option on beamer. The former one will disable all the pattern rendering, and the latter one will ignore all the TOC (table of contents) generating.

The project has been implanted to Overleaf. Here is the link [**?**]. And to make that works, the compilation on TEX Live 2021 has to be implemented. And it is discovered that setting the document information outside the `document`

environment will cause a significantly longer compiling time, which may be caused by some improper settings in CTEX package. The workaround of that is to follow the setup mentioned in `CJK` settings: put that info into the body of document[**?**].

Currently, CI is available on Github Actions by compiling on LuaLaTeX. SJTUBeamer MIN use `xu-cheng/latex-action@v2` for the compilation docker [**?**] and relocate the compiling folder to `src/`. After compiling, output the PDF artifact. See `.github/workflows/main.yml` for details.

At the same time, AutoBeamer[**?**] is making its own effort on generating beamer code automatically by some replacing strategies. You could preview your beamer code through conversion on Markdown or the article LaTeX code.

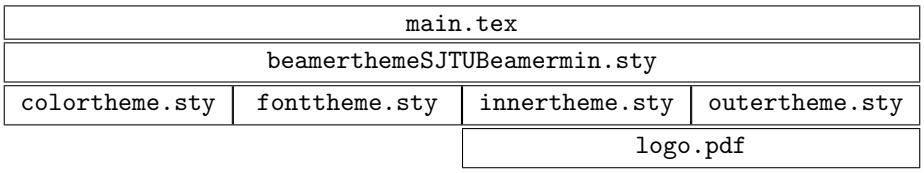
Furthermore, there is a wider space for boosting up the beamer compilation time by making use of multi-core processors. Since it is a frame-based document, and the connection between each frame is loose (only some page numbers and citations need to be calculated), the multi-threaded compilation is possible for the beamer class. You can glimpse the multi-threaded processing for LaTeX from the package animate. In fact, the author created some batch compiling work[**?**] together with the `-Parallel` parameter in PowerShell 7 to make full use of the concurrent computer architecture.

3 Modular Architecture

By the recommendation from beamer package[**?**], SJTUBeamer MIN use the same modular architecture to build the template. Like it is in Java, to let the beamer template locate your theme, the style files have to be in the standard names.

`.sty File`	**Description**
`beamercolorthemeSJTUBeamermin.sty`	Define global color schemes.
`beamerfontthemeSJTUBeamermin.sty`	Set the font format.
`beamerinnerthemeSJTUBeamermin.sty`	Specifies all parts inside a frame.
`beamerouterthemeSJTUBeamermin.sty`	The frame header and bottom bar.
`beamerthemeSJTUBeamermin.sty`	Entry point of the theme.

Notice that there are some dependencies (logo files) in the `vi/`. Copying the `vi` folder is necessary. Or you could define the location of the logo file by the option `[logo=]`.



3.1 Theme

The main theme file `beamerthemeSJTUBeamermin.sty` is the entry point of the theme template. For users, after acquiring the beamer package, `\usetheme` command will serve as the caller of the theme.

```
\documentclass{beamer}
\mode<presentation>
\usetheme{SJTUBeamermin}
```

And this file will preprocess the option passed to the theme. Some options will be affected immediately, while others will get processed in the sub-style files.

`theme.sty`
lang
cjk
gbt
other settings

`colortheme.sty`	color
`fonttheme.sty`	
`innertheme.sty`	pattern,color,logo
`outertheme.sty`	pattern,navigation,logo