

Developer's Guide on SJTUBeamer MIN

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1 Preface

SJTUBeamer MIN is a presentation template based on beamer package in L^AT_EX, to fulfill the enthusiasm of those SJTU users to present their content nicely benefiting from the technology of T_EX 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 | - <i>minimal</i> : | minimal work set of SJTU VI. |
| MIN | - <i>minimalism</i> : | designed in the style of minimalism. |
| MIN | - <i>minimum</i> : | minimum shapes to show your content. |

2 Compliation

Most problems come from L^AT_EX 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[1]. And if you want to use the `latexmk` command, please install Perl[2] first. And the compilation command for SJTUBeamer [MIN] is as follows:

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

2.2 T_EX Live

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

On Ubuntu, you could install `pgf` and `xcolor` and other drawing packages through the following command[3]:

```
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[4]:

```
\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 T_EX 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[5]:

```
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 T_EX 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 pdfL_AT_EX to XeL_AT_EX 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.

In the future, the project will be implanted to Overleaf. Here is a link to the temporary address on Overleaf[6]. And to make that works, the compilation on T_EX Live 2021 has to be implemented. And it is discovered that setting the

document information outside the `document` environment will cause a significant longer compiling time, which may be caused by some improper settings in `CTEX` package. The workaround of that is to follow the set up mentioned in `CJK` settings: put those infos into the body of document[4].

Currently, CI is available on Github Actions by compiling on `LuaLaTeX`. `SJTUBeamer` [MIN] use `xu-cheng/latex-action@v2` for the compilation docker [7] 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`[8] 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 of the multi-threaded processing for `LaTeX` from the package `animate`. In fact, the author created some batch compiling work[9] 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[3], `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 |
|--|---|
| <code>beamercolorthemeSJTUBeamermin.sty</code> | Define global color schemes. |
| <code>beamerfontthemeSJTUBeamermin.sty</code> | Set the font format. |
| <code>beamerinnerthemeSJTUBeamermin.sty</code> | Specifies all parts inside a frame. |
| <code>beamerouterthemeSJTUBeamermin.sty</code> | Layout the frame header and bottom bar. |
| <code>beamerthemeSJTUBeamermin.sty</code> | Entry point of the theme. |

Notice that there is some dependencies (logo files) in the `vi/`. Copying `vi` folder is necessary.

References

- [1] “MiKTeX.” [Online]. Available: <https://miktex.org/>
- [2] “Perl.” [Online]. Available: <https://www.perl.org/>
- [3] T. Tantau, J. Wright, and V. Miletic, *The beamer class: User Guide for version 3.59.*, Jul. 2020. [Online]. Available: <https://github.com/josephwright/beamer>

- [4] Log Creative, “ \LaTeX Sparkle Project Chapter 3.” [Online]. Available: <https://logcreative.github.io/LaTeXSparkle/src/art/chapter03.html>
- [5] TUG, “Upgrade from \TeX Live 2020 to 2021.” [Online]. Available: <http://www.tug.org/texlive/upgrade.html>
- [6] Log Creative. SJTUBeamermin. [Online]. Available: <https://www.overleaf.com/read/pwjmbjqwjftv>
- [7] xu-cheng, “ \LaTeX -action.” [Online]. Available: <https://github.com/xu-cheng/latex-action>
- [8] Log Creative, “Autobeamer.” [Online]. Available: <https://github.com/LogCreative/AutoBeamer>
- [9] —, “PGFPlotsEdt.” [Online]. Available: <https://github.com/LogCreative/PGFPlotsEdt/blob/master/res/logo/anim/animrender.ps1>