

The LXGW Font Family* | 落霞与孤鹜齐飞 秋水共长天一色

Maintainer: LXGW (落霞孤鹜), Administrator: Mingyu Xia (夏明宇)[†]

Released 2025-12-06 v1.521F

This package packs a selection of open-source fonts from the 霞鹜文楷^{轻便版}, 霞鹜文楷^{国标}^{轻便版}, 霞鹜漫黑, 小赖字体, and 悠哉字体, which are released into public domain by LXGW since 2021. They are licensed under the [SIL Open Font License \(OFL\)](#).

Abstract

The LXGW Font Family provides an open-source CJK font family with a comprehensive character set for Chinese (Simplified/Traditional), Cantonese, and Japanese. A `fontset` configuration of this font family for the `ctex-kit` is also provided in this package.

1 Usage

Users are allowed to use the friendly interface: the `fontset` key in the `ctex` package

```
\usepackage[fontset = lxgw]{ctex}
```

or the `ctex` classes

```
\documentclass[fontset = lxgw]{ctex<art|book|rep|beamer>}
```

with $\text{Xe}_{\text{L}}\text{TeX}$, $\text{Lua}_{\text{L}}\text{TeX}$, and $\text{up}_{\text{L}}\text{TeX}$ supported. Since the unusually long mapping time of `zhmap`, $\text{pdf}_{\text{L}}\text{TeX}$ is not supported temporarily. Additionally, the following four commands are provided for convenience.

<code>\songti</code>	宋体 (CJKmainfont): LXGWenKaiGBLite-Regular.ttf, LXGWenKaiGBLite-Medium.ttf.
<code>\heiti</code>	黑体 (CJKsansfont): LXGWMarkerGothic-Regular.ttf (with <code>AutoFakeBold</code> option).
<code>\fangsong</code>	仿宋 (CJKmonofont): LXGWXiaolai-Regular.ttf.
<code>\kaishu</code>	楷书 (itshape of CJKmainfont): LXGWYozai-Regular.ttf, LXGWYozai-Medium.ttf.

Note that the names of the four control sequences make no sense here, just to keep the same naming habit of `ctex-kit`.

The implementation of this user-friendly interface is included in [A.1](#), [A.2](#), and [A.3](#).

*<https://github.com/lxgw>, <https://github.com/myhsia/LXGW-CTAN>

[†]xiamingyu@westlake.edu.cn

2 Font Demos

The following lists the Chinese/English name, filename, and demos of the fonts: Cantonese, Japanese, Chinese (Simplified/Traditional) versions of “**I Can Eat Glass**”, missing character markers are provided with punctuation compression disabled and fulfilling line.

霞鹜文楷 (LXGW WenKai) LXGWWenKaiLite-Regular.ttf, LXGWWenKaiLite-Medium.ttf

我可以食玻璃，佢傷唔到我㗎。私はガラスを食べられます。それは私を傷つけません。
我能吞下玻璃而不伤身体。我能吞下玻璃而不伤身体。我能吞下玻璃而不傷身體。③③③

霞鹜文楷 国标 (LXGW WenKai_{GB}) LXGWWenKaiGBLite-Regular.ttf, LXGWWenKaiGBLite-Medium.ttf

我可以食玻璃，佢傷唔到我㗎。私はガラスを食べられます。それは私を傷つけません。
我能吞下玻璃而不伤身体。我能吞下玻璃而不伤身体。我能吞下玻璃而不傷身體。③③③

霞鹜漫黑 (LXGW Marker Gothic) LXGWMarkerGothic-Regular.ttf

我可以食玻璃，佢傷唔到我㗎。私はガラスを食べられます。それは私を傷つけません。
我能吞下玻璃而不伤身体。我能吞下玻璃而不伤身体。我能吞下玻璃而不傷身體。③③③

小赖字体 (Xiaolai Font) LXGWXiaolai-Regular.ttf

我可以食玻璃，佢傷唔到我㗎。私はガラスを食べられます。それは私を傷つけません。
我能吞下玻璃而不伤身体。我能吞下玻璃而不伤身体。我能吞下玻璃而不傷身體。③③③

悠哉字体 (Yozai Font) LXGWYozai-Regular.ttf, LXGWYozai-Medium.ttf

我可以食玻璃，佢傷唔到我㗎。私はガラスを食べられます。それは私を傷つけません。
我能吞下玻璃而不伤身体。我能吞下玻璃而不伤身体。我能吞下玻璃而不傷身體。③③③

A The Source Code

A.1 The `ctex-fontset-lxgw.def` file

Start the optionlist fontset for l3docstrip.

```
1 <*fontset>
```

Declare the ctex-kit font configuration file with date, version, and description.

```
2 \ProvidesExplFile{ctex-fontset-lxgw.def}
3 {2025-12-06} {1.521F} {lxgw fontset configuration for ctex-kit}
```

Load CJK font family, interface provided by ctex-kit.

```
4 \ctex_fontset_case:nnnn
```

The pdfTeX (generate PDF directly) branch is no longer supported for the LXGW font family. Here will raise a `fontset-unavailable` error.

```
5 { \ctex_fontset_error:n { lxgw } }
6 {
```

The pdfTeX (generate DVI) branch.

Load the .spa file for the CJKpunct package.

```
7 \ctex_file_input:n { ctexpunct-lxgw.spa }
```

Case choice controlled by the zhmap key of ctex-kit.

```
8 \ctex_zhmap_case:nnn
```

#1: Content of this argument will be outputted to the input stream when zhmap = zhmCJK

```
\cs_gset_eq:NN \ctex_zhmap_case:nnn \use_i:nnn
```

The LXGW font family uses the default unicode cmap.

```
9 {
10   \setCJKmainfont { LXGWWenKaiLite-Regular.ttf }
11   [
12     BoldFont = LXGWWenKaiLite-Medium.ttf,
13     ItalicFont = LXGWYozai-Regular.ttf,
14   ]
15   \setCJKsansfont { LXGWMarkerGothic-Regular.ttf } [ AutoFakeBold ]
16   \setCJKmonofont { LXGWXiaolai-Regular.ttf } [ AutoFakeBold ]
17   \setCJKfamilyfont { zhsong } { LXGWWenKaiLite-Regular.ttf }
18   [ BoldFont = LXGWWenKaiLite-Medium.ttf ]
19   \setCJKfamilyfont { zhhei } { LXGWMarkerGothic-Regular.ttf }
20   [ AutoFakeBold ]
21   \setCJKfamilyfont { zhfs } { LXGWXiaolai-Regular.ttf }
22   [ AutoFakeBold ]
23   \setCJKfamilyfont { zhkai } { LXGWYozai-Regular.ttf }
24   [ BoldFont = LXGWYozai-Medium.ttf ]
```

Configure the usages of the edge information of the defined CJK families.

```
25 \ctex_punct_set:n { lxgw }
26 \ctex_punct_map_family:nn { \CJKrmdefault } { zhsong }
27 \ctex_punct_map_family:nn { \CJKsfdefault } { zhhei }
28 \ctex_punct_map_family:nn { \CJKttdefault } { zhfs }
29 \ctex_punct_map_bfseries:nn { \CJKrmdefault, zhsong } { zhsongb }
30 \ctex_punct_map_bfseries:nn { \CJKsfdefault, zhhei } { zhheib }
31 \ctex_punct_map_itshape:nn { \CJKrmdefault } { zhkai }
32 }
```

#2: Content of this argument will be outputted to the input stream when `zhmap = true`

```
\cs_gset_eq:NN \ctex_zhmap_case:nnn \use_ii:nnn
```

Load the mapping file `ctex-zhmap-lxgw.tex` for zhmatrices and set `\CJKrmdefault`, `\CJKsfdefault`, `\CJKttdefault` respectively.

```
33 {
34   \ctex_load_zhmap:nnnn { rm } { zhhei } { zhfs } { lxgw }
```

Configure the usages of the edge information of `\CJKrmdefault`.

```
35   \ctex_punct_set:n { lxgw }
36   \ctex_punct_map_family:nn { \CJKrmdefault } { zhsong }
37   \ctex_punct_map_bfseries:nn { \CJKrmdefault } { zhhei }
38   \ctex_punct_map_itshape:nn { \CJKrmdefault } { zhkai }
39 }
```

#3: Content of this argument will be outputted to the input stream when `zhmap = false`

```
\cs_gset_eq:NN \ctex_zhmap_case:nnn \use_iii:nnn
```

Here will raise a `fontset-unavailable` error.

```
40   { \ctex_fontset_error:n { lxgw } }
41 }
```

The upTeX branch.

Configure the basic font mapping for upTeX. Due to the definition in `zhmetrics-uptex`, configure

1. upshape of serif font.
2. bfseries of serif font.
3. itshape of serif font.
4. upshape of sans font.
5. bfseries of sans font.
6. upshape of mono font.

```
42 {
43   \ctex_set_upmap_unicode:nnn { upserif }
44     { LXGWenKaiLite-Regular.ttf } { LXGWenKaiLite-Medium.ttf }
45   \ctex_set_upmap_unicode:nnn { upsans }
46     { LXGWMarkerGothic-Regular.ttf } { }
47   \ctex_set_upmap_unicode:nnn { upmono }
48     { LXGWXiaolai-Regular.ttf } { }
49   \ctex_set_upmap_unicode:nnn { upserifit }
50     { LXGWYozai-Regular.ttf } { }
```

Config the NFSS font families `zhsong`, `zhhei`, `zhfs`, and `zhkai` to the JFM name in normal type and bold type. Leave empty for those font families with no bold version.

```
51   \ctex_set_upfamily:nnn { zhsong } { upzhserif } { upzhserifb }
52   \ctex_set_upfamily:nnn { zhhei } { upzhsans } { }
53   \ctex_set_upfamily:nnn { zhfs } { upzhmono } { }
54   \ctex_set_upfamily:nnn { zhkai } { upzhserifit } { upzhserifitb }
55 }
```

The XeTeX/LuaTeX branch.

```
56 {
57   \setCJKmainfont { LXGWenKaiLite-Regular }
58   [
59     Extension = .ttf,
60     BoldFont = LXGWenKaiLite-Medium,
```

```

61         ItalicFont = LXGWYozai-Regular
62     ]
63     \setCJKsansfont { LXGWMarkerGothic-Regular }
64     [ Extension = .ttf, AutoFakeBold ]
65     \setCJKmonofont { LXGWXiaolai-Regular }
66     [ Extension = .ttf, AutoFakeBold ]
67     \setCJKfamilyfont { zhsong } { LXGWWenKaiLite-Regular }
68     [ Extension = .ttf, BoldFont = LXGWWenKaiLite-Medium ]
69     \setCJKfamilyfont { zhhei } { LXGWMarkerGothic-Regular }
70     [ Extension = .ttf, AutoFakeBold ]
71     \setCJKfamilyfont { zhfs } { LXGWXiaolai-Regular }
72     [ Extension = .ttf, AutoFakeBold ]
73     \setCJKfamilyfont { zhkai } { LXGWYozai-Regular }
74     [ Extension = .ttf, BoldFont = LXGWYozai-Medium ]
75 }

```

\songti Shortcuts that same as those in the ctex-kit.

```

\heiti
\fangsong
\kaishu
76 \NewDocumentCommand \songti { } { \CJKfamily { zhsong } }
77 \NewDocumentCommand \heiti { } { \CJKfamily { zhhei } }
78 \NewDocumentCommand \fangsong { } { \CJKfamily { zhfs } }
79 \NewDocumentCommand \kaishu { } { \CJKfamily { zhkai } }

```

(End of definition for \songti and others. These functions are documented on page 1.)

End the optionlist fontset for l3docstrip.

```

80 </fontset>

```

A.2 The ctexpunct-lxgw.spa file

To make the .spa file, run the following script: ctex-spa-make.tex

```

\input ctex-spa-macro %
\MAKESPA {ctexpunct-lxgw.spa}
{
    {lxgwzhsong}      {LXGWWenKaiLite-Regular} ,
    {lxgwzhsongb}     {LXGWWenKaiLite-Medium} ,
    {lxgwgzbzhsong}   {LXGWWenKaiGBLite-Regular} ,
    {lxgwgzbzhsongb}  {LXGWWenKaiGBLite-Medium} ,
    {lxgwzhhei}       {LXGWMarkerGothic-Regular} ,
    {lxgwzhfs}        {LXGWXiaolai-Regular} ,
    {lxgwzhkai}       {LXGWYozai-Regular} ,
    {lxgwzhkaib}      {LXGWYozai-Medium} ,
}
\primitive\end

```

by executing the following line in the terminal

```
xetex ctex-spa-make
```

The .spa file of the corresponding font will be used for the CJKpunct package to achieve the punctuation compression, which can ensure the best typeset effect (under the pdf_TE_X engine).

A.3 The ctex-zhmap-lxgw.tex file

Start the optionlist zhmap for l3docstrip.

81 `<{*zhmap}`

Forked from the zhmap optionlist of ctex.dtx¹.

```
82 \begingroup\catcode61\catcode48\catcode32=10\relax%
83 \catcode 35=6 % #
84 \catcode 45=12 % -
85 \catcode123=1 % {
86 \catcode125=2 % }
87 \toks0{\endlinechar=\the\endlinechar\relax}%
88 \toks2{\endlinechar=-1}%
89 \def\x#1 #2 {%
90   \toks0\expandafter{\the\toks0 \catcode#1=\the\catcode#1\relax}%
91   \toks2\expandafter{\the\toks2 \catcode#1=#2}}%
92 \x 13 5 % carriage return
93 \x 32 10 % space
94 \x 35 6 % #
95 \x 40 12 % (
96 \x 41 12 % )
97 \x 45 12 % -
98 \x 46 12 % .
99 \x 47 12 % /
100 \x 58 12 % :
101 \x 60 12 % <
102 \x 61 12 % =
103 \x 64 11 % @
104 \x 91 12 % [
105 \x 93 12 % ]
106 \x 123 1 % {
107 \x 125 2 % }
108 \edef\x#1{\endgroup%
109   \edef\noexpand#1{%
110     \the\toks0 %
111     \let\noexpand\noexpand\noexpand#1%
112     \noexpand\noexpand\noexpand\undefined%
113     \noexpand\noexpand\noexpand\endinput}%
114   \the\toks2}%
115 \expandafter\x\csname ctex@zhmap@endinput\endcsname
116 \begingroup\expandafter\endgroup
117 \expandafter\let\csname ifzhmappdf\endcsname\csname
118   \expandafter\ifx\csname ifctexpdf\endcsname\relax
119     \expandafter\ifx\csname pdfoutput\endcsname\relax
120       iffalse\else\ifnum\pdfoutput < 1 iffalse\else iftrue\fi\fi
121     \else ifctexpdf\fi
122   \endcsname
123 \begingroup
124 \expandafter\ifx\csname ProvidesFile\endcsname\relax
125   \long\def\x#1\ProvidesFile#2[#3]{%
126     #1%
127     \immediate\write-1{File: #2 #3}%
128   \expandafter\xdef\csname ver@#2\endcsname{#3}}
```

¹<https://github.com/CTeX-org/ctex-kit/blob/master/ctex/ctex.dtx>

```

129 \expandafter\x%
130 \fi
131 \endgroup

```

Provides the identification information of the font mapping file.

```

132 \ProvidesFile{ctex-zhmap-lxgw.tex}%
133 [2025-12-06 v1.521F lxgw font map loader for DVIPDFMx (CTEX)]

```

The font mapping configurations.

```

134 \ifzhmappdf \iffalse
135 \pdfmapline{=gbk@UGBK@ <LXGWWenKaiLite-Regular.ttf}
136 \pdfmapline{=gbksong@UGBK@ <LXGWWenKaiLite-Regular.ttf}
137 \pdfmapline{=gbkkai@UGBK@ <LXGWYozai-Regular.ttf}
138 \pdfmapline{=gbkhei@UGBK@ <LXGWMarkerGothic-Regular.ttf}
139 \pdfmapline{=gbkfs@UGBK@ <LXGWXiaolai-Regular.ttf}
140 \pdfmapline{=cyberb@Unicode@ <LXGWWenKaiLite-Regular.ttf}
141 \pdfmapline{=unisong@Unicode@ <LXGWWenKaiLite-Regular.ttf}
142 \pdfmapline{=unikai@Unicode@ <LXGWYozai-Regular.ttf}
143 \pdfmapline{=unihei@Unicode@ <LXGWMarkerGothic-Regular.ttf}
144 \pdfmapline{=unifs@Unicode@ <LXGWXiaolai-Regular.ttf}
145 \pdfmapline{=gbksongsl@UGBK@ <LXGWWenKaiLite-Regular.ttf}
146 \pdfmapline{=gbkkaisl@UGBK@ <LXGWYozai-Regular.ttf}
147 \pdfmapline{=gbkheisl@UGBK@ <LXGWMarkerGothic-Regular.ttf}
148 \pdfmapline{=gbkfssl@UGBK@ <LXGWXiaolai-Regular.ttf}
149 \pdfmapline{=unisongsl@Unicode@ <LXGWWenKaiLite-Regular.ttf}
150 \pdfmapline{=unikaisl@Unicode@ <LXGWYozai-Regular.ttf}
151 \pdfmapline{=uniheisl@Unicode@ <LXGWMarkerGothic-Regular.ttf}
152 \pdfmapline{=unifssl@Unicode@ <LXGWXiaolai-Regular.ttf}

```

Since pdf \TeX maps too slowly, this mode is obsolete.

```

153 \fi \else
154 \special{pdf:mapline gbk@UGBK@ unicode LXGWWenKaiLite-Regular.ttf}
155 \special{pdf:mapline gbksong@UGBK@ unicode LXGWWenKaiLite-Regular.ttf}
156 \special{pdf:mapline gbkkai@UGBK@ unicode LXGWYozai-Regular.ttf}
157 \special{pdf:mapline gbkhei@UGBK@ unicode LXGWMarkerGothic-Regular.ttf}
158 \special{pdf:mapline gbkfs@UGBK@ unicode LXGWXiaolai-Regular.ttf}
159 \special{pdf:mapline cyberb@Unicode@ unicode LXGWWenKaiLite-Regular.ttf}
160 \special{pdf:mapline unisong@Unicode@ unicode LXGWWenKaiLite-Regular.ttf}
161 \special{pdf:mapline unikai@Unicode@ unicode LXGWYozai-Regular.ttf}
162 \special{pdf:mapline unihei@Unicode@ unicode LXGWMarkerGothic-Regular.ttf}
163 \special{pdf:mapline unifs@Unicode@ unicode LXGWXiaolai-Regular.ttf}
164 \special{pdf:mapline gbksongsl@UGBK@ unicode LXGWWenKaiLite-Regular.ttf -s .167}
165 \special{pdf:mapline gbkkaisl@UGBK@ unicode LXGWYozai-Regular.ttf -s .167}
166 \special{pdf:mapline gbkheisl@UGBK@ unicode LXGWMarkerGothic-Regular.ttf -s .167}
167 \special{pdf:mapline gbkfssl@UGBK@ unicode LXGWXiaolai-Regular.ttf -s .167}
168 \special{pdf:mapline unisongsl@Unicode@ unicode LXGWWenKaiLite-Regular.ttf -s .167}
169 \special{pdf:mapline unikaisl@Unicode@ unicode LXGWYozai-Regular.ttf -s .167}
170 \special{pdf:mapline uniheisl@Unicode@ unicode LXGWMarkerGothic-Regular.ttf -s .167}
171 \special{pdf:mapline unifssl@Unicode@ unicode LXGWXiaolai-Regular.ttf -s .167}
172 \fi

```

End the optionlist zhmap for l3docstrip.

```

173 \*zhmap

```