

# **LuaTeX-CN Documentation**

— High-Quality Classical Chinese Typesetting —

Auto-generated from GitHub Wiki

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# LuaTeX-CN Wiki

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Welcome to the LuaTeX-CN Wiki. This site provides comprehensive documentation for users and developers to help you create high-quality classic Chinese typesettings using LuaTeX-CN.

**Current Version:** [v0.3.0](#) | **CTAN:** [v0.1.1](#)

## Quick Access

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-  [Quick Start](#) - Get started with your first project in 5 minutes
-  [Installation](#) - Install LuaTeX-CN on your system
-  [Examples](#) - Explore "Records of the Grand Historian" (Shiji) and "Dream of the Red Chamber"

## Documentation

---

### 1. Fundamentals

- [Templates & Format](#) - Understand the "Banxin" (Page Center) concept
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- [Text Boxes](#) - Absolute positioning and adaptive containers
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- 

## Developers

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For information on contributing or understanding the internal architecture:

- [Development Guide](#)
  - [Release Process](#)
- 

## Contact

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# Installation Guide

---

This page describes how to install the `luatex-cn` package.

## Method 1: Via CTAN/Package Manager (Recommended)

---

Install using your TeX distribution's package manager:

```
# TeX Live (Windows/Linux)
tlmgr install luatex-cn

# MiKTeX
# Open MiKTeX Console → Packages → Search for luatex-cn
```

**⚠ Note:** The CTAN version may lag behind GitHub. We recommend using GitHub Release.

## Method 2: Manual Installation from GitHub Release

---

**1. Download:** Go to [GitHub Releases](#) and download the latest `luatex-cn-tex-v*.zip`

**2. Locate texmf directory:**

- **Windows:** `C:\Users\<username>\texmf`
- **macOS/Linux:** `~/texmf`

**3. Place files:** Put the contents of `tex/` into:

```
texmf/tex/latex/luatex-cn/
```

**4. Refresh database:**

```
texhash
```

## Method 3: Direct Usage

---

Place the contents of `tex/` in the same directory as your `.tex` file and compile directly.

## Verify Installation

---

Create a test file `test.tex`:

```
\documentclass[四库全书]{guji}
\begin{document}
\begin{正文}
天地玄黄，宇宙洪荒。
\end{正文}
\end{document}
```

Run:

```
lualatex test.tex
```

If compilation succeeds, installation is complete.

## System Requirements

---

- LuaTeX (TeX Live 2024+ recommended)
- `luaotfload` and `fontspec`

## Font Requirements

---

We recommend installing these fonts for best results:

- Noto Serif CJK SC (Source Han Serif)
- FangSong or KaiTi (for traditional book effects)

# Quick Start

---

This page helps you quickly get started with `luatex-cn` for traditional Chinese book typesetting.

## Basic Template

---

```
\documentclass[四库全书]{guji}
% Optional: specify font
% \setmainfont{Noto Serif SC}

\title{钦定四库全书}
\chapter{史记\\卷一}

\begin{document}
\begin{正文}

This is sample vertical text for ancient book typesetting.

\end{正文}
\end{document}
```

## Common Commands

---

### Interlinear Notes (Double-line Small Text)

```
Main text\\夹注{This is interlinear note content, auto-balances}continued text.
```

### Side Notes

```
Main text\\侧批[yoffset=10pt]{This is side note content}continued text.
```

### Paragraph Indentation

```
\begin{段落}[indent=2]
天地玄黄\\\\\\
```

```
宇宙洪荒  
\end{段落}
```

## Spaces

```
Need\\空格[2]two spaces here.
```

## Annotation Box

```
\\批注[x=5cm, y=2cm, height=6, color={1 0 0}]{Annotation content}
```

## Seal

```
\\印章[page=1, xshift=2cm, yshift=5cm]{seal.png}
```

## Force Column Break

```
End of this column\\\\\  
Start of new column
```

## Metadata Setup (vo.2.0+)

```
\title{Book Title}  
\publisher{Publisher Name}  
\ChapterMarker{Volume 1}
```

Or using the setup command:

```
\metadataSetup{  
    title = Book Title,  
    publisher = Publisher Name  
}
```

## Debug Mode (vo.2.2+)

```
\LtcDebugOn % Enable debug ruler, shows grid coordinates  
\LtcDebugOff % Disable debug mode
```

## Preset Styles

---

Choose preset styles via document class options:

Option	Description
四库全书	Qing Dynasty Siku Quanshu style, single fishtail
红楼梦甲戌本	Manuscript style, no fishtail

```
\documentclass[四库全书]{guji}  
% or  
\documentclass[红楼梦甲戌本]{guji}
```

## Next Steps

---

- See [Examples](#) for more complex usage
- Read [Changelog](#) for latest features

# Examples

---

This directory contains multiple usage examples for the `luatex-cn` package, demonstrating different features from traditional ancient book typesetting to modern vertical layouts.

## Example List

---

### 1. Records of the Grand Historian - Basic Annals of the Five Emperors

**Features:** Demonstrates highly complex ancient book typesetting.

**Capabilities:**

- Absolutely positioned red seals (overlaying text)
- Customized page center text with single fishtail
- Complex interlinear note typesetting
- Traditional black silk frame and indentation

Black & White	Color Preview
	Shiji Color

Black & White	Color Preview
	

 [View Source](#)

## 2. Records of the Grand Historian - Table of Contents

**Features:** Following Qing Dynasty "Siku Quanshu" Northern Pavilion style.

**Capabilities:**

- Standard ancient book table of contents layout
- "Eight lines, twenty-one characters" format restriction
- Typical white mouth, double borders on all sides, single fishtail format

 [View Source](#)

## 3. Dream of the Red Chamber - Jiaxu Manuscript

**Features:** Simulates manuscript/annotated copy style.

**Capabilities:**

- **Side and marginal notes:** Edge annotations using the sidenote system
- **Double-column small text:** Double-line small annotations in main text

- No fishtail page center, bottom page numbers

Page 2 (Punctuation)	Page 1 (Marginal Notes)
<p style="text-align: right;">卷之二 古文真賞 卷之二 第</p> <p>仙鄉慈有蟲談道富覺之石骨 師襄心補性那說貴打事邊格 聽愛攜天却人道但勤後高不 畢享帶濟稱世大自凡便談凡 齊幾弟世通間師恨心說快丰 愁年子之況榮弟粗也到論神 笑自得材見耀子蟲想紅先迴 道當八利二繁蟲不要塵是別 善永紅物師華物得到中說說 哉佩慶濟仙心不已人榮些說 善洪在人形切能便問華雲笑 哉恩那之道慕見口去富山笑 那萬富德體之禮吐享貴霧來 紅劫貴如定弟了人一此海至 塵不堪蒙非子適言享石神峰 中忘中發凡質聞向這聽僻下 有也溫一品雖二那榮了玄坐 却二柔點必粗位僧華不幻于</p>	<p style="text-align: right;">正材之用用十時方篇列第一 自當不後使了四于使唐位一 已嗟堪畫無三丈大閭細看瓢回 棹入人在頑荒者謫官士 之選已此石山了則你隱 際遂過山十三無然深道夢 俄因青五萬稽不有此幻 見然見埂百六崖憑趣書識 一自象峰接千株原味從靈通 僧嘆石下只五成來待何 一日俱誰半百高女在而賈 道夜得知半零經嫡下來雨 遠悲此的十一氏將說村 遠號天石綱魂二蝶此起風 而慚獨自了鍋丈石來根塵 來愧自經一皇方補歷由懷 生一己姪塊氏經天註雖制 得日無嫌未只二之明近光</p>

 [View Source](#)

## 4. Modern Vertical Book

**Features:** Clean modern vertical layout style.

**Capabilities:**

- Demonstrates pure vertical text support without traditional book elements
- Suitable for modern literature or reports requiring vertical typesetting

 Modern vertical books are not currently the project focus; more features will be added later.

 [View Source](#)

*Note: All ancient book examples are digital reconstructions based on historical document scans, intended to demonstrate `luatex-cn`'s adaptability to various complex vertical typesetting scenarios.*

# Templates and Customization

---

`luatex-cn` provides a flexible template system with built-in and custom templates.

## Built-in Templates

---

Template Name	Document Class	Description
四库全书	<code>guji</code>	Classic official book style (B&W)
四库全书彩色	<code>guji</code>	Classic official book style (Color)
红楼梦甲戌本	<code>guji</code>	Manuscript style with side/top notes
<code>default</code>	<code>cn-vbook / tw-vbook</code>	Default modern vertical style (Taiwan punct)
中华书局	<code>cn-vbook</code>	Zhonghua Shuju modern style (Mainland punct)

## Using Templates

---

Specify the template name in document class options:

```
% guji templates
\documentclass[四库全书彩色]{guji}
\documentclass[红楼梦甲戌本]{guji}

% cn-vbook / tw-vbook templates (v0.2.7+)
\documentclass{cn-vbook}           % Default template
\documentclass[中华书局]{cn-vbook} % Zhonghua Shuju template
```

# Custom Templates

---

## Method 1: Create Configuration File

### guji Template

Create a `luatex-cn-guji-<template-name>.cfg` file in the `configs/` directory:

```
\gujiSetup{ template = default }

\pageSetup{
    paper-width = 1077.2pt,
    paper-height = 1077.2pt,
}

\contentSetup{
    n-column = 12,
    font-size = 30pt,
    border = true,
}

\banxinSetup{
    upper-yuwei = true,
    lower-yuwei = true,
}

\endinput
```

### cn-vbook / tw-vbook Template (v0.2.7+)

Create a `luatex-cn-book-<template-name>.cfg` file in the `configs/` directory:

```
\pageSetup{
    paper-width = 148mm,
    paper-height = 210mm,
    page-number-style = digits,
}

\contentSetup{
    font-size = 11pt,
    line-spacing = 13pt,
    n-column = 0,
    border = false,
}

\punctSetup{punct-style=taiwan}

\endinput
```

## Method 2: Direct Configuration in Document

```
\documentclass{guji}

\gujiSetup{
    book-name = My Book Title,
    chapter-title = Chapter One,
}

\contentSetup{
    n-column = 10,
    font-size = 24pt,
    border = true,
}

\begin{document}
% ...
\end{document}
```

## Configuration Reference Table

Command	Parameter	Description	Default
\gujiSetup	book-name	Book name	-
	chapter-title	Chapter title	-
	template	Template name	default
\contentSetup	n-column	Columns per half page	12
	font-size	Font size	30pt
	line-spacing	Line spacing	45pt
	n-char-per-col	Characters per column	18
	border	Show border	true
	layout-mode	Layout mode (vo.2.7+)	grid
\pageSetup	paper-width	Paper width	-
	paper-height	Paper height	-
	margin-*	Margins	-
	page-number-style	Number style (vo.2.7+)	none
\banxinSetup	banxin-upper-ratio	Upper section ratio	0.18

<b>Command</b>	<b>Parameter</b>	<b>Description</b>	<b>Default</b>
	<code>upper-yuwei</code>	Upper fish tail	<code>true</code>
<code>\punctSetup</code>	<code>punct-style</code>	Punct style (vo.2.7+)	<code>taiwan</code>
	<code>punct-squeeze</code>	Squeeze (vo.2.7+)	<code>true</code>
	<code>kinsoku</code>	Line-breaking rules (vo.2.7+)	<code>true</code>

---

☞ Next: See [Debug Mode](#) or [Features](#)

# Fonts

---

`luatex-cn` provides intelligent cross-platform font detection and a powerful multi-font fallback mechanism to gracefully handle missing characters (rare glyphs).

## 1. Automatic Font Detection

---

By default, the `guji` (or `cn-vbook` / `tw-vbook`) document class automatically selects the most suitable installed fonts based on your operating system:

- **Windows:** Prioritizes SimSun, SimHei, etc.
- **macOS:** Prioritizes Songti SC, PingFang SC, etc.
- **Linux:** Prioritizes Fandol series or Noto CJK series.

To manually trigger and apply the auto-detected font:

```
\ApplyAutoFont
```

## Chinese Font Name Support (vo.2.2+)

Since vo.2.2, font detection supports simplified and traditional Chinese font names:

```
\设置字体{宋体}          % Simplified Chinese name  
\设置字体{標楷體}      % Traditional Chinese name  
\设置字体{思源宋体}    % Open source font Chinese name
```

The system automatically maps Chinese font names to corresponding system fonts.

## 2. Font Family & Fallback

---

vo.1.5 introduces the concept of **Font Family**. By setting a font family, the system establishes a "fallback chain". When the main font lacks a specific character (e.g., a rare CJK ideograph), it automatically looks for it in the next font in the chain.

## \setFontFamily

This command accepts a comma-separated list of fonts. The first font in the list becomes the main font, and the rest serve as fallbacks.

```
% Sets "Source Han Serif SC" as the main font.  
% If a character is missing, it tries "SimSun", then "SimHei".  
\setFontFamily{Source Han Serif SC, SimSun, SimHei}
```

Chinese Alias:

```
\设置字体族{Source Han Serif SC, SimSun, SimHei}
```

To define a named fallback chain for custom usage:

```
% Define a chain named "mybackup"  
  
% Apply this chain to a specific font  
\setmainfont{MyCustomFont}[RawFeature={fallback=mybackup}]
```

## 3. Standard Font Setting

If you only need to set a single font without fallback logic:

```
\setmainfont{KaiTi}  
% or  
\设置字体{KaiTi}
```

[!NOTE] For vertical layout, `luatex-cn` generally handles vertical features (`RawFeature={+vert}`) automatically.

☞ Next: [Correction or Features](#).

# Features Overview

---

`luatex-cn` provides a rich set of features for ancient Chinese book typesetting, ranging from core vertical engines to various decorative elements.

## 1. Core Typesetting Engine

---

A grid-based layout system built on LuaTeX for high-precision vertical text flows.

- **RTT Direction:** Native support for top-to-bottom, right-to-left direction.
- **Grid Positioning:** Characters are precisely aligned to a defined grid.
- **Pagination & Column Flow:** Handles complex page splitting and column transitions automatically.

## 2. Document Classes

---

- **guji:** Traditional ancient book typesetting with banxin, fishtail, silk frames.
- **cn-vbook / tw-vbook** (vo.2.7+): Modern vertical books with clean design, built-in footnotes and punctuation system.

## 3. Punctuation Processing

---

- **Punctuation System** (vo.2.7+): Modern punct squeeze, kinsoku, vertical quote replacement with mainland/Taiwan styles.
- **Judou:** Traditional punctuation marks with three modes (normal/judou/none) switchable at any time.

## 4. Traditional Book Elements

---

Full support for visual elements required by traditional binding:

- **Banxin & Yuwei:** Support for single/double fishtails, black silk frames, etc.
- **Split Page:** Support for electronic reading and traditional "tube page" binding.
- **Border System:** Double borders, inner borders, and customizable thickness.

## 5. Annotation & Revision System

---

Multiple ways to add comments to the text:

- **Interlinear Notes**: Double-line small text within main body with auto-balancing.
- **Side Notes**: Vertical annotations between text columns.
- **Annotations**: Floating annotation boxes placed anywhere on the page.
- **Marginal Notes** (vo.2.3+): Top-of-page annotations.
- **Footnotes** (vo.2.7+): Endnotes and page-bottom notes with lujiao/circled numbering.
- **TOC Entries**: \条目 (vo.2.5+) with hierarchical indentation.

## 6. Layout Control & Commands

---

- **Force Column**: \列 (or \Column) forces content to start in a new column.
- **Last Column**: \末列 (or \LastColumn) places content in the last column.
- **Flexible Widths**: \行[width=2cm]{...} (vo.2.7+) for variable-width columns.
- **Page Breaks**: Supports standard \newpage and \clearpage .
- **Natural Layout** (vo.2.7+): layout-mode=natural for non-uniform spacing.

## 7. Decorations & Utilities

---

- **Seals**: Add collection or personal seals anywhere with opacity support.
- **Fonts**: Auto-detection, font families, and fallback chains. Supports simplified/traditional Chinese font names since vo.2.2.
- **Textbox**: Grid-based layout with auto-compression and filling.
- **Correction & Decoration**: Correction marks and character decoration.
- **Elevation** (vo.2.6+): Honorific elevation formatting (single/double/triple/flat).

## 8. Architecture & Debug Features (vo.2.0+)

---

- **Style Registry**: Multi-attribute style storage with cross-page preservation.
- **Metadata System**: Centralized book metadata management.
- **Debug Mode**: Grid visualization and layout debugging.
- **Plugin Architecture**: Standardized plugin API with three-phase interfaces.

## 9. Template System

---

Preset classical styles available out-of-the-box. See [Templates](#).

- 四库全书 (Siku Quanshu): Qing Dynasty imperial style.
  - 四库全书彩色 : Colored version.
  - 红楼梦甲戌本 : Manuscript style.
  - 中华书局 (v0.2.7+): Modern mainland-style vertical layout.
- 

☞ Next Steps: Check [Templates](#) | [Debug Mode](#) | [Examples](#)

# Modern Vertical Book Classes (v0.2.7+)

luatecxn provides two document classes for modern vertical Chinese book typesetting. Unlike `guji` (ancient book typesetting), they use a clean, modern design: no banxin, no fishtail, no silk frames — suitable for contemporary publications that need vertical layout.

Class	Punct Style	Description
<code>cn-vbook</code> (v0.2.8+)	Mainland	Simplified Chinese vertical books
<code>tw-vbook</code> (v0.2.8+)	Taiwan	Traditional Chinese vertical books
<code>ltc-book</code>	Taiwan	Legacy name, still works

## Basic Usage

```
\documentclass{cn-vbook}
\setmainfont{Noto Serif SC}

\begin{document}
\begin{正文}
天地玄黄，宇宙洪荒。日月盈昃，辰宿列张。
\end{正文}
\end{document}
```

## Template System

Option	Description	Punct Style
(none)	Default, 16-kai (170x240mm), 12pt font	Taiwan
中华书局	Zhonghua Shuju style, 15pt font, footnotes enabled	Mainland

```
\documentclass{cn-vbook} % Default
\documentclass[中华书局]{cn-vbook} % Zhonghua Shuju
```

## Differences from guji

---

Feature	cn-vbook / tw-vbook	guji
Design	Modern, clean	Traditional ancient
Banxin/Yuwei	No	Yes
Borders/Silk frames	No	Yes
Layout mode	Free column width ( <code>n-column=0</code> )	Fixed grid ( <code>n-column=8</code> )
Default punct	Modern (normal)	Configurable judou/normal
Footnotes	Built-in	Manual loading
Page numbers	Auto vertical	In banxin center

## Punctuation Style

---

`cn-vbook / tw-vbook` enable the modern punctuation system by default. See [Punctuation System](#).

```
\documentclass{cn-vbook}
\punctSetup{punct-style=mainland} % Override to mainland style
```

Or use `\documentclass[中华书局]{cn-vbook}` which automatically sets mainland style.

You can also switch to judou mode: `\开启句读模式`

## Footnote System

---

Built-in footnote support with endnote and page-bottom modes.

```
\脚注设置{number-style=lujiao, indent=1em}
天地玄黄\脚注{This is a footnote}。
\输出脚注 % Output at paragraph end
```

## Configuration (\footnoteSetup / \脚注设置)

Parameter	Description	Default	Values
mode	Mode	endnote	endnote, page
number-style	Style	lujiao	lujiao ([—]), circled (①)
separator	Separator	blank	blank, none
font-size	Size	0.8em	Any dimension
indent	Indent	1em	Any dimension

## Commands

Command	Chinese	Description
\Footnote{...}	\脚注{...}	Add footnote
\FlushFootnote	\输出脚注	Output endnotes
\footnoteSetup{...}	\脚注设置{...}	Configure
\ResetFootnoteCounter	\重置脚注计数	Reset counter

## Page Numbers

Auto vertical page numbers at lower-left. Configure via \pageSetup :

Parameter	Default
page-number-style	digits (also: chinese, arabic, none)
page-number-font-size	9pt
page-number-x	3mm
page-number-y	8mm

## Custom Templates

Create `configs/luatex-cn-book-<name>.cfg` with `\pageSetup`, `\contentSetup`, `\punctSetup`, then use `\documentclass[name]{cn-vbook}`.

---

Next: [Punctuation](#) | [Features](#) | [Templates](#)

# Punctuation System (v0.2.7+)

---

`luatex-cn` provides a complete modern punctuation processing system with squeeze, kinsoku (line-breaking rules), vertical quote replacement, and mainland/Taiwan style support.

## Punctuation System vs Judou System

---

`luatex-cn` has two mutually exclusive punctuation mechanisms:

System	Use Case	punct-mode	Description
<b>Punctuation</b> (this page)	Modern books	<code>normal</code> (default)	Squeeze, kinsoku, quote replacement
<b>[Judou ](#en-judou)</b>	Ancient books	<code>judou</code> or <code>none</code>	Convert punct to circles/dots or remove

When `punct-mode=normal`, the punctuation system is active; when `punct-mode=judou` or `none`, the judou system takes over and the punctuation system is automatically disabled.

## Punctuation Styles

---

### Taiwan Style (Default)

All punctuation marks are centered within the grid cell.

```
\punctSetup{punct-style=taiwan}  
% or  
\台湾标点风格
```

### Mainland Style

Period (。) and comma (，) marks are offset toward the upper-right corner of the grid cell, matching mainland Chinese publishing conventions.

```
\punctSetup{punct-style=mainland}  
% or  
\大陆标点风格
```

## Configuration

Configure punctuation behavior via `\punctSetup`:

```
\punctSetup{  
    punct-style = taiwan,      % Style: taiwan or mainland  
    punct-squeeze = true,     % Squeeze: compress punct to half-grid  
    kinsoku = true,          % Kinsoku: prevent misplaced punct  
    punct-hanging = false,    % Hanging (in development)  
}
```

Parameter	Description	Default	Values
punct-style	Punctuation style	taiwan	taiwan, mainland
punct-squeeze	Squeeze punctuation	true	true, false
kinsoku	Line-breaking rules	true	true, false
punct-hanging	Hanging punctuation	false	true, false

## Punctuation Squeeze

When enabled, periods, commas and other marks are compressed to half the grid cell height, producing a tighter, more elegant layout.

## Kinsoku (Line-Breaking Rules)

Follows Chinese typesetting standards (CLREQ) to prevent marks from appearing in inappropriate positions:

- **Line-start forbidden:** Closing brackets, periods, commas, middle marks cannot appear at column start
- **Line-end forbidden:** Opening brackets cannot appear at column end

# Vertical Quote Replacement

---

The system automatically replaces horizontal bracket/quote forms with Unicode Vertical Presentation Forms (e.g., 「→﹂, 」→﹂, (→﹂, )→﹂, 《→﹂, 》→﹂, —→|, ...→:).

## Using with cn-vbook / tw-vbook

---

The `cn-vbook` / `tw-vbook` document classes enable the punctuation system by default. Choose styles via templates:

```
% Default template: Taiwan style
\documentclass{cn-vbook}

% Zhonghua Shuju template: Mainland style
\documentclass[中华书局]{cn-vbook}
```

## Using with guji

---

The `guji` class also supports the punctuation system. When `punct-mode=normal`, it activates automatically:

```
\documentclass[四库全书]{guji}
\正常标点模式 % Use modern punctuation (not judou)
\punctSetup{punct-style=mainland}
```

## Switching Between Modes

---

You can dynamically switch between the punctuation and judou systems:

```
\正常标点模式    % Modern punctuation
\句读模式        % Judou mode (circles/dots)
\无标点模式      % Plain text (no punctuation)
```

## Technical Details

---

Implemented via `luatex-cn-core-punct.lua` in three stages:

1. **Flatten:** Classify punctuation characters and replace with vertical forms

**2. Layout:** Apply squeeze and kinsoku processing

**3. Render:** Apply mainland/Taiwan style position offsets

---

↶ Next: [Judou](#) | [Modern Vertical](#) | [Features](#)

# Judou (Punctuation Modes)

---

**Judou** (jù dòu) refers to the traditional Chinese system of punctuation and pausing marks. `luatex-cn` can automatically convert modern punctuation into traditional styles suitable for ancient book typesetting.

## Punctuation Mode Overview

---

`luatex-cn` provides three punctuation modes (`punct-mode`), switchable via `\judouSetup` or convenience commands:

Mode	Description	System
<code>normal</code> (default)	Modern full-width punctuation with squeeze/kinsoku	[Punctuation ](#en-punctuation)
<code>judou</code>	Convert to traditional Ju/Dou marks (circles/dots)	Judou system
<code>none</code>	Remove all punctuation (plain text / "Baiwen")	None

**Note:** The punctuation system and judou system are **mutually exclusive**. When `punct-mode=normal`, the punctuation system handles squeeze/kinsoku; when `punct-mode=judou` or `none`, the judou system takes over.

## What is Judou Mode?

---

Traditional ancient books typically do not use modern full-width punctuation marks. Instead, they use small circles ("Ju") or dots ("Dou") attached to the characters.

- **Ju (句)**: Corresponds to periods (.), question marks (?), and exclamation marks (!). Rendered as a small circle (○).
- **Dou (读)**: Corresponds to commas (,), semicolons (;), and enumeration commas (、). Rendered as a small dot or tick (●).

## Supported Punctuation (vo.2.1+)

Since vo.2.1, the range of supported punctuation has been extended to include:

- Basic punctuation: periods, commas, enumeration commas, semicolons, colons
- Paired punctuation: quotation marks (「」『』"""), book title marks (《》〈〉), parentheses
- Special punctuation: dashes, ellipses, interpuncts, etc.

## Usage

---

### 1. Switching Punctuation Modes

```
% Enable judou mode
\JudouOn
\开启句读模式
\句读模式

% Return to modern punctuation
\JudouOff
\关闭句读模式
\正常标点模式

% Plain text mode (no punctuation)
\无标点模式
\开启无标点模式
```

### 2. Using with Different Document Classes

#### guji (Ancient Books)

```
\documentclass[四库全书]{guji}
\开启句读模式 % Use traditional judou

\begin{document}
\begin{正文}
人之初，性本善。
% Commas become dots, periods become circles at bottom-right
\end{正文}
\end{document}
```

## cn-vbook / tw-vbook (Modern Books)

```
\documentclass{cn-vbook}
% cn-vbook defaults to modern punctuation (punct-mode=normal)

\begin{document}
\begin{正文}
天地玄黄，宇宙洪荒。 % Modern punct with squeeze/kinsoku

\句读模式
寒来暑往，秋收冬藏。 % Switch to judou
\end{正文}
\end{document}
```

## 3. Dynamic Switching

```
\句读模式
人之初，性本善。 % Judou marks

\正常标点模式
现代文：他说：“一二三。” % Modern punctuation

\无标点模式
子曰学而时习之不亦说乎 % Plain text (Baiwen)
```

## Parameters

Fine-tune Judou appearance via `\judouSetup` :

Key	Description	Default
<code>punct-mode</code>	Punctuation mode	<code>normal</code>
<code>judou-color</code>	Color of the marks	<code>red</code>
<code>judou-size</code>	Size of the marks	<code>1em</code>
<code>judou-pos</code>	Position relative to character	<code>right-bottom</code>

```
\judouSetup{
    punct-mode = judou,
    judou-color = black,
    judou-size = 0.8em,
}
```

# Command Reference

---

Command	Chinese Alias	Description
\JudouOn	\开启句读模式	Enable judou mode
\JudouOff	\关闭句读模式	Disable judou mode
\NormalPunctuationMode	\正常标点模式	Switch to modern punct
\JudouPunctuationMode	\句读模式	Switch to judou mode
\NonePunctuationMode	\无标点模式	Switch to plain text
\judouSetup{...}	-	Configure judou parameters

## Technical Details

---

Implemented via `luatex-cn-guji-judou.lua` :

1. **Identification:** Scans node stream for punctuation Unicode code points.
  2. **Conversion:** In `judou` mode, punctuation nodes are removed and replaced by a decorate marker node attached to the preceding CJK character.
  3. **Rendering:** The renderer draws the circle/dot at the specified anchor point (usually bottom-right) of the character.
- 

☞ Next: [Punctuation | Features](#)

# Interlinear & Side Notes

---

`luatex-cn` offers a comprehensive annotation system, including in-text interlinear notes and marginal side notes.

## Interlinear Notes (Jiazhu / 夹注)

---

Commonly seen in ancient books as double-line small characters between main body text.

### Usage

```
Main text\\夹注{This is interlinear note content. If it is long, it will automatically split into two col
```

### Key Features

- **Auto-Balancing Algorithm:** The system calculates the remaining space in the current column and splits the note content evenly into right and left sub-columns.
- **Cross-Column/Page Flow:** When a note doesn't fit in one column, it flows to the next column or page automatically.
- **Alignment Control:** Supports `left`, `right`, `center`, `inward`, and `outward` (default) alignment modes.
- **Balance Control (v0.2.6+):** Use `auto-balance=false` to disable the automatic balancing algorithm. Useful for manual line breaks or replicating specific historical manuscript styles.

### Jiazhu Configuration

```
\jiazhuSetup{  
    font-size = 12pt,  
    font = {FandolSong-Regular},  
    font-color = red,  
    auto-balance = true, % Whether to auto-balance sub-column lengths  
    align = outward      % Alignment mode  
}
```

# Side Notes (SideNode / 侧批)

Small annotations placed between text columns or at page margins.

## Usage

Three syntax options:

```
% Basic usage
Main text\\侧批{This is the side note content}continued text.

% Positional parameter (auto-converts to em)
Main text\\侧批[5pt]{Note with adjusted height}continued text.
Main text\\侧批[0.5]{Equivalent to 0.5em}continued text.

% Named parameters
Main text\\侧批[yshift=10pt, color=red]{Both color and position}continued text.
```

## Parameters

- `yshift` : Vertical offset with positional parameter support. Pure numbers auto-convert to em units (e.g., `0.5` → `0.5em`).
- `color` : Annotation color (default: red).
- `font-size` : Font size for the note (default: 10pt).
- `grid-height` : Custom grid height for the note block (default: equals font size).
- `border-padding-top` : Top border padding (default: opt).
- `border-padding-bottom` : Bottom border padding (default: opt).

## Global Configuration

```
\sidenoteSetup{
    color = red,
    font-size = 19pt,
    grid-height = 20pt,
    yshift = 0em,
    border-padding-top = 0.5em,
    border-padding-bottom = 0.5em
}
```

## Aliases

- Setup command: `\sidenoteSetup` / `\CePiSetup` / `\侧批设置` (Simplified) / `\側批設置` (Traditional)

- Vertical shift parameter: `yshift` / 纵移 (Simplified) / 縱移 (Traditional)

## Cross-Page Color Preservation (v0.2.1+)

v0.2.1 introduced the style registry mechanism. Side note color settings now persist correctly across pages. Even when side note content spans multiple pages, colors remain consistent.

---

## Technical Implementation (For Developers)

---

- **Interlinear Notes:** Uses LuaTeX attributes to mark nodes. During layout, the system detects these attributes, pauses normal typesetting, and calls `core_textflow.lua` for column splitting and re-mapping to the grid. Migrated to style stack architecture since v0.2.1.
  - **Side Notes:** Managed by `core_sidenote.lua`. It captures the content as an independent box and calculates the offset based on the current reference character's coordinates. Supports Phase 2 style registry for color preservation since v0.2.1.
  - **Style Registry:** `luatex-cn-style-registry.lua` provides multi-attribute style storage, supporting deduplication and cross-page preservation for color, font\_size, grid\_height, and other attributes.
- 

☞ Next Steps: Check [Annotations](#) or [Judou](#).

# Annotations (PiZhu / 批注)

---

The `\批注` command allows placing floating annotation boxes anywhere on the page, simulating post-publication notes or commentaries in ancient manuscripts.

## Usage

---

```
\批注[x=5cm, y=2cm, height=6, color={1 0 0}]{Annotation content}
```

## Parameters

---

- `x` : Horizontal position of the top-left corner (relative to page center).
- `y` : Vertical position of the top-left corner (relative to page center).
- `height` : Number of grid rows (height) allocated for the box.
- `color` : Color in RGB format (e.g., `{1 0 0}` for red).
- `font-size` : Font size inside the annotation.
- `grid-width` : Custom grid cell width for the box.
- `grid-height` : Custom grid cell height for the box.

## Features

---

- **Absolute Positioning:** Does not occupy main body space; overlaid directly at specified coordinates.
- **Auto-Columnizing:** If content exceeds the set `height`, it automatically starts a new column within the box.
- **Clip Prevention:** Position calculations account for Banxin (page center) to prevent content being cut off by borders.
- **Multi-column Support:** Internal columns can be precisely controlled via `n-cols`.
- **Independent Indentation (vo.2.2+):** Annotation content no longer inherits paragraph indentation from main text (fix #37).

## Technical Implementation

---

Under the hood, annotations are based on `core_textbox.lua`. Content is rendered into an independent vertical grid system. This produced box is then overlaid during the page rendering stage using `shipout` logic in `render_page.lua`.

---

# Marginal Notes (MeiPi / 眉批) **vo.2.3+**

---

The `\眉批` command places annotations at the top of the page (above the main text), a common format in traditional Chinese book annotations. Unlike `\批注`, MeiPi automatically calculates positions, arranging from right to left to avoid overlap.

## Usage

```
% Auto-positioning (recommended)
\眉批[height=5]{Marginal note content}

% Manual Y coordinate
\眉批[height=5, y=50pt]{Marginal note content}

% Fully manual positioning
\眉批[height=5, x=100pt, y=50pt]{Marginal note content}
```

## Parameters

- `height` : Number of grid rows (height) for the note, **required**.
- `x` : Horizontal position. Auto-calculated if not specified, arranging right-to-left.
- `y` : Vertical position. Auto-calculated if not specified, aligning bottom edge to main text top.
- `color` : Color, default red `{1 0 0}` .
- `font-size` : Font size, default 18pt.
- `grid-width` : Grid width, default 20pt.
- `grid-height` : Grid height, default 19pt.

## Features

- **Auto-arrangement** (vo.2.3+): Multiple MeiPi notes automatically arrange right-to-left. Spacing configurable via `\meipiSetup{spacing=...}` .
- **Smart Positioning**: Y coordinate auto-calculated so bottom edge aligns with main text top.

- **Cross-page Support** (v0.2.3+): MeiPi correctly appears on the page where its anchor is located, not the previous page.
- **Independent Indentation**: MeiPi content does not inherit paragraph indentation from main text.

## Configuration

---

```
\meipiSetup{
    spacing = 10pt,    % Spacing between MeiPi notes
    gap = 0pt          % Gap between MeiPi bottom and main text top
}
```

## Technical Implementation

---

MeiPi is based on `guji/luatex-cn-guji-meipi.lua`. It inserts anchor nodes into the node list to record positions, then during layout phase determines which page the MeiPi should appear on based on the **first node with layout information after** the anchor.

---

☞ Next Steps: Check [Seals](#) or [Judou](#).

# Correction & Decoration

---

`luatex-cn` provides tools for classical text correction and decoration, including correction marks, emphasis marks, and underlines (proper name marks / book title marks).

## Correction (GaiZi)

---

The `\fix` (or `\改`) command marks corrections in classical text editing. It retains the original character with a deletion mark ( ` ) and places the replacement character at the bottom right.

### Usage

```
\fix{replacement}  
% or Chinese alias  
\改{替换字}
```

### Example

```
This has a \fix{correct}wrong text.
```

In this example, "wrong" is marked with a deletion symbol, and "correct" is placed at its bottom-right corner at 60% size.

### Technical Details

- **Deletion Mark:** Automatically overlays a deletion point ( ` ) on the character.
- **Replacement Text:** Placed at bottom-right corner at 60% of original font size.
- **Non-destructive:** Does not affect the original grid layout.

---

## Text Decoration

---

Preset commands for marking text according to classical or modern standards.

## 1. Underline Marks

Command	Alias	Description	Use Case
\Underline	\下划线	Straight line on the left	General highlighting
\专名号	-	Straight line on the left	Proper names (Person, Place)
\WavyUnderline	\波浪线	Wavy line on the left	General highlighting
\书名号	-	Wavy line on the left	Book/Article titles

**Options ( [options] ):**

- `color` : Line color (default: `red` ).
- `offset` : Distance from text (default: `0.6em` ).

**Example:**

```
\专名号[color=black]{Confucius}  
\书名号{The Analects}
```

**Technical Improvement (v0.2.6+):** Underlines have been migrated from glyph-based ( | ) to **PDF Graphics** implementation. This solves:

- Line discontinuity at the end of columns/pages.
- Strong coupling between line thickness/position and specific fonts.
- Support for use within sidenotes, jiazhu, and textboxes.

## Elevation (Taitou / 抬头) v0.2.6+

`luatex-cn` provides full support for "Taitou" (Elevation/Rising). See: [Elevation](#).

## 2. Emphasis Marks

Command	Alias	Description
\EmphasisMark	\着重号	Add small circles ( ° ) to the right of each char
\圈点	-	Same as above

## Example:

```
\EmphasisMark{Very Important}
```

## Generic Decoration

The `\decorate` (or `\装饰`) command allows overlaying arbitrary content on **each character**.

## Usage

```
\decorate[options]{content}
```

## Parameters

Key	Description	Default
<code>char</code>	Decoration character	<code>o</code>
<code>color</code>	Color	<code>red</code>
<code>xoffset</code>	Horizontal offset (xshift)	<code>0pt</code>
<code>yoffset</code>	Vertical offset (yshift)	<code>0pt</code>
<code>scale</code>	Scale factor	<code>1.0</code>
<code>font-size</code>	Force specific font size	<code>auto</code>

## Example

```
% Add a red circle on each character in "important"
\decorate[char=o, scale=0.8, color=red]{important}
```

☞ Next: [Textbox](#) or [Features](#).

# Elevation (Taitou / 抬头) **v0.2.6+**

---

`luatex-cn` provides full support for "Taitou" (Elevation/Rising), a traditional formatting used in ancient Chinese texts to show respect by starting a new line and raising the text height.

## Usage

Command	Effect	Description
<code>\抬头[N]</code>	New line, raised by N cells	Core command, N can be pos/neg
<code>\平抬</code>	New line, top-aligned	Equivalent to <code>\抬头[0]</code>
<code>\单抬</code>	New line, 1 cell higher	Equivalent to <code>\抬头[1]</code>
<code>\双抬</code>	New line, 2 cells higher	Equivalent to <code>\抬头[2]</code>
<code>\三抬</code>	New line, 3 cells higher	Equivalent to <code>\抬头[3]</code>
<code>\相对抬头[N]</code>	Raise by N cells relative to indent	Used in indented contexts like Jiazhu

## Automatic Border Wrapping

Taitou is deeply integrated with the Banxin (page frame) system. When text "breaks out" of the normal layout into the margin, `luatex-cn` automatically draws stepped border lines to ensure the silk frames correctly wrap the elevated text.

## Example

```
The Great\单抬 Sage Confucius
```

## Technical Details

---

The Elevation feature is defined in `luatex-cn-core-paragraph.sty` and implemented across `luatex-cn-core-textflow.lua` and `luatex-cn-layout-grid.lua`. When an elevation command is invoked, the layout engine adjusts the starting row (`cur_row`) for the current column and records the elevation height. The rendering layer in `luatex-cn-core-render-border.lua` then uses this data to draw the stepped border lines.

---

↶ Next: [Templates & Format or Features](#).

# Textbox

---

`luatex-cn` provides powerful vertical text box capabilities with grid alignment.

## Basic Textbox

---

The `\TextBox` (or `\文本框`) command creates an independent vertical text area.

### Usage

```
\TextBox[options]{Content}
```

### Options

Key	Description	Default
<code>height</code>	Height in grid units. 0 for auto-extension.	<code>0</code>
<code>n-cols</code>	Number of columns.	<code>0</code>
<code>border</code>	Show border.	<code>false</code>
<code>background-color</code>	Background color.	None
<code>floating</code>	Enable floating mode (needs x, y).	<code>false</code>

### Features

- **Auto-Extension:** If `height` is 0, the box extends naturally.
- **Compression (Flat Text):** If `height` is fixed and content is too long, text is vertically compressed (vo.1.5).
- **Independent Indentation (vo.2.2+):** Textbox content no longer inherits paragraph indentation from main text, ensuring layout independence (fix #37).

## Fill Textbox

---

`\FillTextBox` (or `\填充文本框`) is a variant of `\TextBox` with default fill alignment.

```
\FillTextBox[height=10]{Content}
```

---

↳ Next: [Features](#).

# Seals (YinZhang / 印章)

---

The `\印章` command adds images like collection marks or personal seals to the page, supporting absolute positioning and opacity.

## Usage

---

```
\印章[page=1, xshift=2cm, yshift=5cm, opacity=0.8, width=3cm]{seal.png}
```

## Parameters

---

- `page` : Page number where the seal appears (default: 1).
- `xshift` / `yshift` : Offsets from the page center or margin.
- `opacity` : Opacity (0.0 to 1.0). For ancient books, 0.7-0.9 is recommended to simulate ink absorption.
- `width` : Display width of the seal image.
- `color` : (Optional) Color for vector-based seals.

## Features

---

- **Layer Management:** Seals are rendered during the `shipout/background` hook by default, appearing below the text. This can be customized if foreground placement is needed.
- **Multi-point Layout:** Multiple seal commands can be used on the same page; they are positioned independently based on their coordinates.
- **Absolute Positioning:** Uses TikZ's coordinate system for pinpoint accuracy on the page.

## Technical Implementation

---

Seals leverage LaTeX `shipout` hooks. Each call to `\印章` registers a `tikzpicture` block inside the appropriate hook, wrapped in an `\ifnum\value{page}=N` conditional to ensure images are output on the correct page and at the correct layer.

---

☞ Next Steps: Check [Judou](#) or [Features Overview](#).

# Debug Mode

---

`\luatex-cn` provides comprehensive debugging features to help troubleshoot layout issues.

## Enable/Disable Debug

---

```
\LtcDebugOn    % or \开启调试  
\LtcDebugOff  % or \关闭调试
```

## Module-level Debug

---

Enable debugging for specific modules:

```
\LtcDebugModuleOn{vertical}  % or \开启调试模块{vertical}  
\LtcDebugModuleOff{vertical} % or \关闭调试模块{vertical}
```

## Display Helper Tools

---

### Show Page Frame

```
\LtcShowFrame  % or \显示边框
```

### Show Grid Coordinates

Overlay grid coordinates on the page for element positioning:

```
% Show grid (default unit: cm)  
\LtcShowGrid      % or \显示网格  
  
% Specify unit  
\LtcShowGrid[measure=cm]  % or \显示网格[measure=cm]  
\LtcShowGrid[measure=pt]  
\LtcShowGrid[measure=mm]
```

```
% Hide grid  
\LtcHideGrid % or \隐藏网格
```

Supported units: `cm` (default), `pt`, `mm`

## Show Coordinates

`\显示坐标` is an alias for `\显示网格`:

```
\显示坐标[measure=pt]  
\隐藏坐标
```

## Debug Color Settings

Set different debug colors for different modules:

```
\LtcDebugColor{vertical}{blue}  
\LtcDebugColor{banxin}{red}
```

## Usage Example

```
\documentclass[四库全书彩色]{guji}  
  
% Enable debug mode  
\LtcDebugOn  
\LtcShowGrid[measure=cm]  
  
\begin{document}  
\begin{正文}  
Debug content...  
\end{正文}  
\end{document}
```

## Debug Output

When debug is enabled, the compilation log outputs detailed layout information including:

- Grid position calculations
- Character positioning
- Banxin rendering process
- Plugin invocation order

---

 Back to: [Features](#) | [Home](#)

# Changelog

---

All notable changes to this project will be documented here.

## [0.3.0] - 2026-02-18

---

Project is now stable for full-book typesetting.

- **User Experience Improvements:** Organized parameter naming conventions, updated Wiki and README documentation
- **Template System:** Added templates folder with ready-to-use typesetting templates
- **Paragraph Fix:** Fixed `bottom-indent` default value setting (fix #xx)
- **Banxin Fix:** Fixed banxin chapter alignment handling

**Note:** Before v1.0, commands and parameters may change. Please keep your installation up to date.

## [0.2.9] - 2026-02-18

---

Complete typesetting of *Qinding Siku Quanshu Jianming Mulu (Volume 1)*. Added "digitization" mode for classical text OCR and proofreading.

- **Helper Commands:** Added `\臣`, `\xshift` and other typesetting auxiliary commands
- **Page Processing:** Added cover page, collation page, and blank page processing
- **Digital Mode:** New `guji-digital` document class for OCR-based classical text digitization and proofreading (experimental)
- **SideNote Enhancement:** `\SideNode` now supports positional parameters and numeric auto-conversion (`\SideNode[5pt]` = `\SideNode[0.5]` auto-converts to em)
- **Parameter Renaming:**
  - Renamed: `font-color` Chinese alias 字色 → 字体颜色 (`\Style`, `\Paragraph`, `\SideNode`, etc.)
  - Renamed: `yoffset` → `yshift` (`\SideNode`, Chinese alias 纵偏 → 纵移)

- Renamed: `distribute` → `fill` (`\TextBox`, Chinese alias 均分 → 填充)
- Renamed: `font-name` → `font` (`\Content`, Chinese alias 字体名 → 字体)
- Improved: Paragraph `first-indent` / `bottom-indent` defaults to empty, automatically follows `indent` parameter
- **Taitou Fixes:** Fixed numerous taitou indentation and line-breaking issues
- **Judou Fix:** Fixed judou mode behavior inside jiazhu (interlinear notes)
- **Banxin Fix:** Fixed single-page banxin processing
- **Background Color Fix:** Fixed background color inheritance and override logic

## [0.2.8] - 2026-02-14

---

- **Free Layout Mode:** New automatic column width and flexible column spacing support
- **Style Command:** Added `\样式` command and `Style` environment for inline style overrides (font size, color, grid height, etc.)
- **Cover Feature:** Added `Cover` environment and volume/chapter name commands for ancient book covers
- **Command Renaming:** Document classes unified to `guji`, `cn-vbook`, `tw-vbook`; commands fully support English/simplified/traditional Chinese names
- **Bug Fixes:** Improved modern traditional Chinese vertical typesetting; fixed footnote and heading layout issues
- **Refactoring:** Major refactoring of layout-grid module, unified grid/natural engines, rewrote unit tests

## [0.2.7] - 2026-02-09

---

- **Modern Punctuation System:** Full modern punctuation support (squeeze, kinsoku line-breaking, vertical quote replacement) with mainland/Taiwan style options
- **ltc-book Document Class:** New `ltc-book` class for modern vertical Chinese book typesetting with template system (default/`zhonghuashuju`)
- **Footnote System:** Added `\Footnote` command with endnote and page-bottom modes, lujiao/circled numbering styles
- **Natural Layout Mode:** Added `layout-mode=natural` for non-uniform character spacing with half-grid punctuation and bottom-aligned columns
- **Flexible Column Widths:** `\Column` now supports `width` parameter for variable-width column layouts

- ♦ **Title Page Column Widths:** TitlePage supports `column-widths` parameter for flexible layouts
- ✎ **Bug Fix:** Fixed content loss when `\newpage` follows auto-pagination at column end (fix #63)
- ✎ **Bug Fix:** Fixed `\Space` command being skipped at column start (fix #62)
- ✎ **Bug Fix:** Fixed `\挪抬` command trailing spaces producing extra whitespace
- 🌱 **Refactoring:** Split `render-page.lua` into two modules, reorganized regression tests into three suites

## [0.2.6] - 2026-02-07

---

- ♦ **Taitou Support:** Added `\抬头[N]` system (Single/Double/Triple/Flat/Relative Taitou) with automatic border wrapping
- ♦ **Proper Name/Book Title Marks:** Re-implemented using PDF graphics, solving connectivity and font compatibility issues (fix #53, #56, #57)
- ♦ **Jiazhuh Balance Control:** Added `auto-balance` option for non-balanced layouts
- ✎ **Glyph Rotation Fix:** Added automatic 90° rotation for ellipsis and em dash when font lacks vertical forms
- ✎ **Bug Fix:** Fixed sidenote color leakage across page boundaries (fix #44)
- ✎ **Bug Fix:** Fixed jiazhuh column switching logic

## [0.2.5] - 2026-02-05

---

- ♦ **Catalog Entry Command:** Added `\条目` command with hierarchical indentation for table of contents
- ♦ **Column Control Commands:** Added `\列` (Column) and `\末列` (LastColumn) commands for better layout control (fix #30)
- ✎ **Bug Fix:** Fixed decoration underlines (专名号/书名号) not drawn on last character at column end (fix #54)
- ✎ **Bug Fix:** Fixed character centering offset for some characters (e.g., "漢"), main text now uses width-based centering (fix #55)
- ✎ **Bug Fix:** Fixed sidenote color leakage to banxin when crossing page boundaries (fix #48)

## [0.2.4] - 2026-02-03

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- **◆ Underline Support:** Added `\Underline` / `\下划线` commands, implemented with the `|` character (fix #5)
- **◆ Book Title & Proper Name Marks:** Added `\书名号` (wavy line) and `\专名号` (straight line) commands (fix #16)
- **🐛 Bug Fix:** Fixed sidenote column alignment when switching columns (fix #47)
- **🐛 Bug Fix:** Fixed sidenote going to second column when crossing pages (fix #49)
- **🐛 Bug Fix:** Fixed jiazhu alignment issue (fix #51)
- **🐛 Bug Fix:** Fixed `\newgeometry` not supporting paperwidth/paperheight (fix #52)
- **🐛 Bug Fix:** Fixed sidenote color leakage causing banxin to turn red when crossing pages

## [0.2.3] - 2026-02-01

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- **◆ MeiPi (Marginal Notes):** Added `\眉批` command with auto-positioning and manual coordinate support (fix #46)
- **◆ Special TextBox:** TextBox frame feature with border shape customization (fix #25)
- **◆ Publisher Display:** Added publisher display below banxin with customizable font (fix #26)
- **🐛 Bug Fix:** Fixed annotation and textbox incorrectly inheriting paragraph indentation (fix #37)
- **🐛 Bug Fix:** Fixed MeiPi appearing on wrong page when crossing page boundaries
- **🐛 Bug Fix:** Fixed font detection support for simplified/traditional Chinese names (fix #35)
- **♣ Refactoring:** Refactored border style system with style stack management for border, outer\_border attributes

## [0.2.2] - 2026-01-31

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- **🐛 Bug Fix:** Fixed preamble chapter display on first page (fix #45)
- **🐛 Bug Fix:** Fixed jiazhu column jumping at column end (fix #42)
- **◆ Judou Enhancement:** Support for more Chinese punctuation symbols (fix #40)
- **🐛 Bug Fix:** Fixed TextBox and annotation inheriting paragraph indent (fix #37)

- ⚡ **Debug Feature:** Added debug ruler showing page grid coordinates (fix #31)
- ⚡ **Font Detection:** Support simplified/traditional Chinese font names (fix #35)
- 🌱 **Refactoring:** Consolidated banxin text rendering logic
- 🌱 **Refactoring:** Moved title/publisher commands to metadata.sty
- ✅ **Module Cleanup:** Cleaned up banxin, guji, yinzhang module dependencies

## [0.2.1] - 2026-01-31

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- ⚡ **Color Preservation:** Sidenote color preservation across pages (fix #38, #44)
- ⚡ **Style Stack Architecture:** Implemented Phase 3 style stack for multi-attribute support
- ⚡ **Style Registry:** Phase 2 multi-attribute style storage (color, font\_size, grid\_height)
- 🐛 **Bug Fix:** Fixed sidenote rendering order, now correctly displays above silk columns (fix #38)
- 🐛 **Bug Fix:** Punctuation mode now correctly applies to sidenote content (fix #39)
- 🌱 **Jiazh Migration:** Migrated jiazh functionality to style stack architecture
- 🌱 **Refactoring:** Unified color registration mechanism

## [0.2.0] - 2026-01-31

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- ⚡ **Plugin Architecture:** Refactored to standardized plugin API for consistent component behavior
- ⚡ **Global State Management:** Unified configuration via global tables for all modules
- ⚡ **Metadata System:** Centralized book metadata management (title, publisher, chapter markers)
- 🌱 **Module Namespace:** Clear separation of core/, guji/, banxin/, util/, decorate/
- 🌱 **Major Refactoring:** Plugin system refactoring with standardized module interfaces

## [0.1.5] - 2026-01-28

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- ⚡ **Multi-font Support:** Added multi-font fallback chain and Chinese font setting commands (fix #23).
- ⚡ **New Features:** Implemented \decorate and \fix functionalities, supporting vertical typesetting correction marks (fix #12).

- ♦ **Textbox Enhancements:** Texbox supports vertical compression (flattening) to fit grid positions (fix #24).
- ✎ **Bug Fixes:** Fixed layout bugs including opt dimension parsing error, Judou positioning offsets, and long title squeezing (fix #19, #20).
- ☑ **Regression Tests:** Introduced automated regression testing program based on PDF rendering comparison.
- 🌱 **Refactoring:** Refactored core rendering logic and improved overall code stability.

## [0.1.4] - 2026-01-27

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- ♦ Added Judou (punctuation marks) functionality
- ✎ Fixed paragraph indentation and side note column switching issues
- 🌱 Major code refactoring for better readability and maintainability
- ☑ Added more test files

## [0.1.3] - 2026-01-25

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- ✎ Fixed inaccurate page breaks and page number positioning
- ♦ Annotation coordinates now more accurate, skipping page center to prevent clipping
- 📄 Completely typeset Dream of the Red Chamber (Jiaxu manuscript) Chapter 1
- 🌱 Better compliance with Expl3 syntax
- ☑ Added l3build test files for regression testing
- ☑ Established comprehensive Lua unit testing framework with `l3build test` command support
- ✎ Completely fixed Mock logic and API inconsistency issues in unit tests

## [0.1.2] - 2026-01-22

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- 🌱 Renamed src to tex
- ✎ Completely fixed CRLF and BOM character issues on Windows
- 📦 Adopted l3build, see build.lua
- ✎ Fixed package require paths to ensure release version works out of the box

## [0.1.1] - 2026-01-19

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### Features

- ♦ Added annotation command, still using floating text box underneath

### Fixes

- ✎ Fixed CRLF and BOM character issues on Windows

### Documentation

- ☰ Updated documentation with bilingual support

## [0.1.0] - 2026-01-18

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### Major Features

- **Native Geometric Vertical Typesetting Engine:** Deep Lua customization with grid layout system designed for ancient book typesetting
- **Traditional Book Core Elements:** Complete support for Banxin (page center), Yuwei (fishtail), and traditional silk frames
- **Comprehensive Annotation System:** Flexible interlinear notes and side note functionality
- **Ready-to-use Template System:** Preset visual styles including Siku Quanshu and Dream of the Red Chamber manuscripts
- **Cross-platform Font Auto-detection:** Smart recognition of Windows, macOS, and Linux system fonts
- **Electronic Scroll/Traditional Page Support:** Traditional "tube page" logic and electronic reading adaptation
- **Absolute Positioning Seal System:** Support for placing collection seals anywhere on the page

### Project Infrastructure

- Automated CTAN packaging and release workflow
- Comprehensive bilingual user manuals and multiple classic ancient book reproduction examples

# Development Documentation

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This document summarizes the core design philosophy, modular architecture, and the complete development workflow for the `luatex-cn` typesetting engine.

## 1. Core Architecture: Three-Layer Design

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`luatex-cn` utilizes a three-layer architecture to decouple layout logic from rendering:

1. **LaTeX Interface Layer ( `.sty` , `.cls` )**: Defines user commands; sets attributes and parameters via `luatexbase`.
2. **Coordination Layer ( `core_*.lua` )**: Manages logic flow. For instance, `core_main` orchestrates the main process, while `core_textflow` handles interlinear note splitting.
3. **Processing Layer ( `layout_*.lua` , `render_*.lua` )**:
  - **Flattening**: Converts TeX node lists into linear Lua tables.
  - **Layout**: Calculates grid coordinates for each character and its associated elements.
  - **Rendering**: Reassembles content based on coordinates and outputs PDF instructions.

## Module Directory Structure (vo.2.0+)

```
tex/  
  ├── core/          # Core vertical engine (26 files)  
  ├── guji/          # Ancient book specific features (6 files)  
  ├── banxin/         # Page center system (5 files)  
  ├── splitpage/      # Tube page splitting (2 files)  
  ├── fonts/          # Font auto-detection  
  ├── util/           # Utility modules (including style registry)  
  ├── decorate/        # Text decoration  
  ├── debug/           # Debug tools  
  └── configs/        # Preset configuration files
```

## Plugin System (vo.2.0+)

vo.2.0 introduced a standardized plugin API where each module implements a three-phase interface:

```
plugin = {
    initialize = function(params, engine_ctx) end, -- Initialization
    layout = function(list, layout_map, engine_ctx, context) end, -- Layout
    render = function(head, layout_map, params, context, ...) end -- Rendering
}
```

## Style Registry (v0.2.1+)

`luatex-cn-style-registry.lua` provides multi-attribute style storage:

```
-- Register a style, returns unique ID
local style_id = style_registry.register({
    color = {1, 0, 0},
    font_size = 19,
    grid_height = 20
})

-- Retrieve style by ID
local style = style_registry.get(style_id)
```

Supported attributes: `color`, `font_size`, `grid_height`, `font`, etc.

## 2. Participating in Development

We welcome contributions and Pull Requests (PRs).

### 2.1 Fork & Workflow

- 1. Fork the Repo:** Click the Fork button on GitHub.
- 2. Clone:** Clone your forked repository locally.
- 3. Coding:** Main source code is located in the `tex/` directory.

[!TIP] VS Code with LaTeX Workshop is recommended for development.

### 2.2 Testing

Please ensure all tests pass before submitting a PR.

- 1. Install Dependencies:** You need `l3build` installed.
- 2. Unit Tests:** Run Lua unit tests:

```
l3build test
```

This invokes `test/run_all.lua`.

**3. Regression Tests:** We use automated regression testing based on PDF rendering comparison to prevent layout regressions.

```
l3build check
```

This compiles `.lvt` files in `testfiles/` and compares the output logs (`.tlg`) against baselines. If your changes affect layout, ensure these pass. If layout changes are intentional, update baselines:

```
l3build save test-name
```

## 2.3 Release

For release procedures, please refer to [Release](#).

## 3. Key Technical Details

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### Vertical Direction (RTT)

Leverages LuaTeX's `dir RTT` attribute. In RTT mode, text flows top-to-bottom, and lines stack right-to-left.

### Attribute Management

Uses LuaTeX attributes to pass metadata across languages (e.g., "this glyph belongs to an interlinear note").

[!WARNING] `\selectfont` clears all active attributes. Ensure attributes are reset AFTER setting the font size.

### Node Ownership

Passing nodes to TeX via `tex.box[n] = node` transfers ownership. Use `node.copy_list()` if you need to reuse nodes.

## 4. Development Lessons (LEARNING)

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- **Color Commands:** Must use normalized RGB (e.g., `0 0 0 rg`), not names.
- **Rendering Order:** PDF follows the "painter's model"—later content overlays earlier content. Insert backgrounds at the head of the list to ensure they are at the bottom.
- **Module Loading:** Standardize on `require()` and utilize `package.loaded` for caching.

# Release Process

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`luatex-cn` follows an automated release workflow to ensure compliance with CTAN (Comprehensive TeX Archive Network) standards.

## Development Workflow

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Building and testing are powered by `l3build`:

```
# Run all Lua unit tests
l3build test

# Install to local TEXMFHOME
l3build install

# Create release bundle (.zip)
l3build bundle
```

## Automated Publishing (CI/CD)

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GitHub Actions handles the packaging:

1. **Source Sync:** The `main` branch is used for active development.
2. **Packaging:**
  - Extracts `src/`, 文档/ (docs), and 示例/ (examples).
  - Translates folders and filenames to English as required by CTAN, using `scripts/file_name_translation.json`.
  - Generates the standardized directory structure (doc, example, tex).
3. **Release Branch:** The packaged content is pushed to the `ctan` branch and published via GitHub Releases.

## Versioning

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- Version numbers are stored in the root `VERSION` file.
- Significant changes are recorded in the [Changelog](#).
- We follow Semantic Versioning (SemVer) principles.

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☞ Next Steps: Check [Development Documentation](#).