

Daniel Sacré



– Quick-Start-Guide –

for the "minimalthesis" LaTeX Documentclass, Version 0.0.2-alpha3

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1 Preface

1.1 What is minimalthesis?

A LaTeX documentclass for pdf_lat_ex, which produces a minimalistic layout with minimal effort by the end user, but still allows for customization.

1.2 What is minimalthesis not (yet)?

- feature complete,
- Lua_AT_EX, XeT_EX, etc. compatible,
- otf, ttf font capable

2 General Information

2.1 Default Settings & User Choice

2.1.1 Base Class & Basic Layout

Per default, `minimalthesis` uses the `scrreprt` koma document class with a two sided layout (binding correction: 1 cm) as a basis. The page headers and footers are centered; the footer contains the current page number. The header either contains the current section name (if a section exists; see e.g. page 6) or the current chapter name). Captions include in small, bold font the type of float, its number and are separated by a colon from the description in normal, small font (see e.g. table 4.3).

2.1.2 Language & Locale

The default document language is set to english and currently cannot be changed by the user. The settings for typesetting units (see section 4.3) are directly derived from the default language.

2.1.3 Font, Visuals & Color

The typesetting design is more classic-minimalist: The user has the choice between the standard serif `lmodern` \LaTeX font or a sans serif variant as well as three visual styles (`plain`, `fancy-grayscale`, `fancy-colorful`), which differ in highlighting/usage of color.

2.1.4 Hyperlinks & pdf Metadata

Per default, hidden hyperlinks are activated. The pdf Metadata is created from the user information: It can be configured via the key value pairs offered by `pdfmetadata`. If there is no additional configuration provided by the user, default values and logic will be used.

2.2 General Functionality Overview

2.2.1 Quotation Marks

To facilitate the usage of quotation marks, `minimalthesis` loads the `csquotes` package, which allows to automatically select the appropriate quotation marks based on language preset and sentence parameters by using `\enquote{text}`.

For example,

<code>\enquote{A quotation mark test.}</code>	→	“A quotation mark test.”
<code>\enquote{A \enquote{quotation mark} test.}</code>	→	“A ‘quotation mark’ test.”

3 Bibliography: Prerequisites, Usage & Functionality

3.1 How to Install and Use the Bibliography Tool

The bibliography is created by using `biber`. On a Linux based OS with TeXlive as a \LaTeX back-end, it can be installed via the

```
texlive-bibtex-extra  (Debian based distro)
texlive-bibtexextra   (Arch based disto)
packages.
```

To create the required bibliography files, one has to run in the terminal:

```
biber TEXFILENAME
```

To update the output pdf accordingly, the following sequence of commands is recommended:

```
pdflatex TEXFILENAME.tex &&
biber TEXFILENAME &&
pdflatex TEXFILENAME.tex &&
pdflatex TEXFILENAME.tex
```

For TeXstudio users, it is possible to select under

Options → Configure TeXstudio → Build → Default Bibliography Tool

`biber` as the default bibliography tool. After that, as soon as a change will occur in any of the bibliography files/data, TeXstudio will automatically rebuild the bibliography during the next compilation (so no additional user interaction required). If TeXstudio will not do that, a bibliography rebuild can be forced manually by pressing F8.

3.2 Bibliography and Citation Styles

In version 0.0.2-alpha3, `minimalthesis` provides the user with two choices for the citation style: `numeric` and `author year`.

3.2.1 numeric

Per default, `minimalthesis` version 0.0.2-alpha3 uses the `numeric` style, which is based upon the “Angewandte Chemie” (`chem-angew`) bibliography standard.

Using this style provides the additional `@arxiv` [1] and `@thesis` [2] bibliography drivers, so that Arxiv preprints and theses can be cited properly without any manual adjustments by the user. Their usage is demonstrated in Listing 3.1 and Figure 3.1.

```
@arxiv{arxivExample,
  title={An Citation Example for Publications on Arxiv},
  author={H. Bartolomä and L. Murphy},
  year={2023},
  eprint={XXXX.YYYYY},
  archivePrefix={arXiv},
  JOURNALTITLE = {submitted to Journal XYZ, preliminary version
                  published on arXiv}
}

@thesis{thesisExample,
  author = {J. Doe},
  title={minimalthesis – The Title and a very lengthy Subtitle
        of the Thesis},
  type = {PhD Thesis},
  institution={University XYZ},
  year={2023}
}
```

Listing 3.1: Example bibliography file showing the information required for usage of the `@arxiv` and `@thesis` bibliography drivers provided by `minimalthesis` version 0.0.2-alpha3

- [1] H. Bartolomä, L. Murphy: *An Citation Example for Publications on Arxiv*, submitted to Journal XYZ preliminary version published on arXiv, 2023, arXiv: XXXX.YYYYY.

[2] J. Doe: *minimalthesis – The Title and a very lengthy Subtitle of the Thesis*, PhD Thesis, University XYZ, 2023.

Figure 3.1: Example how the `@arxiv` and `@thesis` bibliography drivers provided by `minimalthesis` version 0.0.2-alpha3 are typeset in the default configuration.

3.2.2 author year

By adapting the bibliography settings in the `\mtSetupComplete` macro, it is possible to switch from numeric to author year citation style.

```
bibliography = {
  style = {
    citing = author year,
    maxcitenames = 1
  },
  file path = ./example-bibliography-biber-author-year.bib
}
```

Listing 3.2: How to change to the author year citation style.

The `maxcitenames` option defines how many other names will be shown, before only the first author followed by “et al.” will be used as a replacement. If not specified, it defaults to 1. A practical example on how to use the author year citation style properly is given with the following paragraphs.

```
@article{testOneAuthor,
  author = "Tibatong, H.",
  title = "The first Single Author Paper",
  year = "1969"
}

@article{testTwoAuthors,
  author = "Tibatong, H. and Bartolomä, H.",
  title = "The first Tibatong et Bartolomä Paper of the Year",
  year = "1969"
}

@article{testThreeAuthors,
  author = "Tibatong, H. and Bartolomä, H. and Murphy, L.",
  title = "The first Tibatong, Bartolomä et Murphy Paper of the Year",
  year = "1969"
}

@article{testTwoAuthorsSameYear,
  author = "Tibatong, H. and Bartolomä, H.",
  title = "The second Tibatong et Bartolomä Paper of the Year",
  year = "1969"
}
```

Listing 3.3: Example bibliography file including some example entries specifically tailored to illustrate the functionality and problems of the author year citation style.

```
\chapter{Tests}
\section{Citations}
The author year citation works: \cite{testOneAuthor} and \cite{testTwoAuthors}
and \cite{testThreeAuthors} and \cite{testTwoAuthorsSameYear}. Of course it
still has its inherent issues as illustrated above, which is why it should not
be used for natural science publications and theses.
```

Listing 3.4: Example \LaTeX code to illustrate the functionality and problems of the author year citation style. Excerpt from the MWE.

1 Tests

1.1 Citations

The author year citation works: Tibatong 1969 and Tibatong et al. 1969a and Tibatong et al. 1969 and Tibatong et al. 1969b. Of course it still has its inherent issues as illustrated above, which is why it should not be used for natural science publications and theses.

Figure 3.2: Example how the author year citation style would look like in a realistic text environment. Excerpt from the MWE.

Tibatong, H. 1969. “The first Single Author Paper.”

Tibatong, H., and H. Bartolomä. 1969a. “The first Tibatong et Bartolomä Paper of the Year.”

———. 1969b. “The second Tibatong et Bartolomä Paper of the Year.”

Tibatong, H., H. Bartolomä, and L. Murphy. 1969. “The first Tibatong, Bartolomä et Murphy Paper of the Year.”

Figure 3.3: Example how the bibliography would look like in the author year citation style. Excerpt from the MWE.

Important Notes

- Changing the citation style from numeric to author year or vice versa sometimes leads to issues during the first compilation. It is therefore recommended to delete all the auxiliary \LaTeX files before the first compilation with the new setting.
- First names of authors have to be abbreviated in bibliography file, otherwise `maxcitenames` does not work properly.

4 Natural Science

4.1 Mathematical Formulae

To facilitate the typesetting of mathematical equations, especially with respect to physical use cases, `minimalthesis` not only loads the `amsmath`, `bm` and `amssymb` packages, but also the `derivative` and `physics` package to especially help with typesetting differentials and derivatives.

Typesetting derivatives via the `derivative` package is very flexible: An example for typesetting

Table 4.1: Examples on how to typeset derivatives with the `derivative` package

```
\pdv{f}{x}, \quad \odv{Q}{t}=\odv{s}{t}, \quad \pdv{f}{x,y}, \quad
\derivset{\odv}[switch-*=false] \odv{y}{x}, \quad \odv[order=n]{y}{x},
\quad\derivset{\odv}[] \odv*\odv{y}{x}{x}, \quad
\derivset{\pdv}[sort-method={sign,symbol,abs}]
\pdv[order={c+kn,-b+2a}]{f}{x,y}
```

$$c \frac{\partial f}{\partial x}, \quad \frac{dQ}{dt} = \frac{ds}{dt}, \quad \frac{\partial^2 f}{\partial x \partial y}, \quad \frac{dy}{dx}, \quad \frac{d^n y}{dx^n}, \quad \frac{d}{dx} \frac{dy}{dx}, \quad \frac{\partial^{kn+2a+c-b} f}{\partial x^{c+kn} \partial y^{-b+2a}}$$

differentials with the `physics` and `derivative` packages:

Table 4.2: Examples on how to typeset differentials with the `physics` and `derivative` package

```
T = \int_{0}^{\infty} t \dd{t},
\quad V = \int_a^b r \dd[3]{r} = \int_a^b r \odif{x,y,z}
```

$$T = \int_0^\infty t \, dt, \quad V = \int_a^b r \, d^3 r = \int_a^b r \, dx \, dy \, dz$$

4.2 Chemical Formulae

For typesetting chemical formulae, `minimalthesis` loads the `mhchem` package.

Table 4.3: Examples how to use `mhchem`. Excerpt from the manual.

<code>\ce{H2O}</code> , <code>\ce{CO2}</code> , <code>\ce{NH3}</code>	→ H_2O , CO_2 , NH_3
<code>\ce{H+}</code> , <code>\ce{CrO4^{2-}}</code> , <code>\ce{[AgCl2]-}</code>	→ H^+ , CrO_4^{2-} , $[\text{AgCl}_2]^-$
<code>\ce{Y^{99+}}</code> , <code>\ce{^{227}_{90}Th+}</code>	→ Y^{99+} , $^{227}_{90}\text{Th}^+$
<code>\ce{Fe^{II}Fe^{III}2O4}</code>	→ $\text{Fe}^{\text{II}}\text{Fe}^{\text{III}}_2\text{O}_4$
<code>\ce{(NH4)2S}</code> , <code>\ce{[(X2)3]^{3+}}</code>	→ $(\text{NH}_4)_2\text{S}$, $[(\text{X}_2)_3]^{3+}$
<code>\ce{CO2 + C -> 2 CO}</code>	→ $\text{CO}_2 + \text{C} \longrightarrow 2 \text{CO}$

For more information, please refer to the official `mhchem` manual.

4.3 Units

To aid with typesetting units, `minimalthesis` loads the `siunitx` package. This package ensures that independent of the user input, all the number and unit conventions derived from the locale settings are satisfied. It also handles the different behavior in math and text environments.

Table 4.4: Examples how to use `siunitx`.

<code>\num{23,3}</code> , <code>\num{23.3}</code>	→ 23.3, 23.3
<code>\SI{23,3}{\volt}</code> , <code>\SI{23.3}{\volt}</code>	→ 23.3 V, 23.3 V
<code>\si{\kilo\metre}</code> ,	→ km,
<code>\si{\kilogram\meter\per\second\squared}</code>	→ kg m s^{-2}
<code>\si[per-mode=fraction]{... ARG AS ABOVE ...}</code>	→ $\frac{\text{kg m}}{\text{s}^2}$
<code>\$s = \SI{9.81}{\meter\per\second\squared}\cdot\int_0^t t \, dt</code>	→ $s = 9.81 \text{ m s}^{-2} \cdot \int_0^t t \, dt$

5 Changelog

5.1 v0.0.2-alpha3

Release Date: 2023-12-18

Added support for user selection between two different bibliography styles (numerical, author year).

5.2 v0.0.2-alpha-2

Release Date: 2023-11-22

Functionality wise identical to v0.0.2-alpha-1, but increased supported TeXlive installations; works now with TeXlive 2020 and newer.

5.3 v0.0.2-alpha-1

Release Date: 2023-11-14

Warning: Not backwards compatible to v0.0.1-alpha!

- Ported user settings from `komavar` to `pgfkeys` (breaking change)
- Renamed `\mtTitlepage` and `\mtTOC` to `\mtGenerateTitlepage` and `\mtGenerateTOC` (breaking change)
- Changed Sans Serif font from `tgtermes` to `newtxtext`

5.4 v0.0.1-alpha

Release Date: 2023-09-27,

Initial implementation with `komavar`

Bibliography

- [1] H. Bartolomä, L. Murphy: *An Citation Example for Publications on Arxiv*, submitted to Journal XYZ preliminary version published on arXiv, 2023, arXiv: XXXX.YYYYYY.
- [2] J. Doe: *minimalthesis – The Title and a very lengthy Subtitle of the Thesis*, PhD Thesis, University XYZ, 2023.