The hagenberg-thesis Package

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Abstract

The hagenberg-thesis package is a collection of modern LaTeX templates for university theses (bachelor, master or diploma programs) and related documents. This manual describes the main features of this package. Pre-configured document templates for English and German manuscripts and a complete tutorial are available on the package’s home repository.

1 Introduction

The complete source of this package and auxiliary materials are available on CTAN and its development repository. The package is made available under the terms of the Creative Commons Attribution 4.0 International Public License.

2 Document classes

The hgb package provides the following document classes, which are based on the standard LaTeX classes book, report and article, respectively:

- hgbthesis (book): for Bachelor, Master and Diploma theses;
- hgbreport (report): for project and term reports;
- hgbarticle (article): for drafting journal articles.

2.1 Class options

The above document classes accept the following options:

- hgbthesis: master, diploma, bachelor, practikum (deprecated), internship, english, german, smartquotes;
- hgbreport: notitlepage, english, german, smartquotes;
3 Style files and user commands

- **hgbarticle**: twocolumn, english, german, smartquotes.

For example, to start a Master thesis in German one would simply place
\documentclass[master,german,smartquotes]{hgbthesis}
at the beginning of the document.

2.2 Thesis parameters (class hgbthesis)

hgbthesis supports several types of thesis documents. The following parameters must be specified for all types:
- \title{...},
- \author{...},
- \programname{...},
- \placeofstudy{...},
- \dateofsubmission{yyyy}{mm}{dd}.

A Bachelor thesis requires the following, additional items (not relevant for Diploma and Master theses):
- \thesisnumber{...},
- \coursetitle{...},
- \semester{...},
- \advisor{...}.

3 Style files and user commands

The package comes with a set of style (*.sty) files that can be used independently of the document classes listed above: hgb.sty, hgbabbrev.sty, hgbbib.sty, hgbheadings.sty, hgblistings.sty, hgbmath.sty.

3.1 General user commands and environments(hgb.sty)

- \hgbDate: Outputs the package version date, e.g., “2019/05/11”.
- \calibrationbox{width}{height}: Inserts a test box for checking the final print size (in millimeters).
- \begin{english} ... \end{english}
- \begin{german} ... \end{german}

3.2 Text commands (hgbabbrev.sty)

Special characters:
- \bs: Inserts a backslash character (short for \textbackslash).
- \obnh: Inserts an optional break with no hyphen (e.g., PlugIn{\obnh}Filter).
3 Style files and user commands

German abbreviations:

- \bzgl: bzgl.
- \bzw: bzw.
- \ca: ca.
- \dah: d. h.
- \Dah: D. h.
- \ds: d. sind
- \etc: etc.
- \evtl: evtl.
- \ia: i. Allg.
- \sa: s. auch
- \so: s. oben
- \su: s. unten
- \ua: u. a.
- \Ua: U. a.
- \uae: u. Ä.
- \usw: usw.
- \va: u. v. a.
- \vum: u. v. m.
- \va: vor allem
- \vgl: vgl.
- \ZB: Zum Beispiel

English abbreviations:

- \ie: i.e.
- \eg: e.g.
- \etc: etc.
- \Eg: E.g.
- \wrt: w.r.t.

3.3 Bibliography commands (hgbbib.sty)

- \AddBibFile: A wrapper to \biblatex’s \addbibresource macro (for backward compatibility only).
- \MakeBibliography[options]: Inserts the reference section or chapter. By default, references are automatically split into category subsections. Use the option nosplit to produce a traditional (i.e., contiguous) list of references.
- \citenobr[keys]: Analogous to the standard \cite{keys} command, but inserts no “backref” page numbers in the bibliography.

4Predefined reference categories are literature, avmedia, online and software.
• \texttt{\mcite[text1]{key1}[text2]{key2}...[textN]{keyN}}: Analogous to \texttt{\biblatex}'s \texttt{\cites} command\footnote{\url{http://mirrors.ctan.org/macros/latex/contrib/biblatex/doc/biblatex.pdf}} but inserts semicolons between reference entries for better readability.

3.4 Code environments (\texttt{hgb listings.sty})

The following types of code environments are defined:

- \texttt{CCode}: for C (ANSI),
- \texttt{CppCode}: for C++ (ISO),
- \texttt{CsCode}: for C#,
- \texttt{CssCode}: for CSS,
- \texttt{GenericCode}: for generic code,
- \texttt{HtmlCode}: for HTML,
- \texttt{JavaCode}: for Java,
- \texttt{JsCode}: for JavaScript,
- \texttt{LaTeXCode}: for LaTeX,
- \texttt{ObjCCode}: for ObjectiveC,
- \texttt{PhpCode}: for PHP,
- \texttt{Swift}: for Swift,
- \texttt{XmlCode}: for XML.

\texttt{hgb listings} is based on the \texttt{listingsutf8} package, thus any valid \texttt{listings} option may be used; for example, the option \texttt{numbers=none} to suppress line numbers:

\begin{JavaCode}[numbers=none]
... // Java code comes here
\end{JavaCode}

3.5 Mathematical commands (\texttt{hgbmath.sty})

\texttt{hgbmath} requires (and automatically loads) the \texttt{amsmath} package, thus all commands and symbols of \texttt{amsmath} are available by default. The following additional commands can only be used in math mode:

- \texttt{\Cpx}: \(\mathbb{C}\) (complex numbers),
- \texttt{\N}: \(\mathbb{N}\) (natural numbers),
- \texttt{\R}: \(\mathbb{R}\) (real numbers),
- \texttt{\Q}: \(\mathbb{Q}\) (rational numbers),
- \texttt{\Z}: \(\mathbb{Z}\) (integer numbers).

\footnote{\url{https://ctan.org/pkg/amsmath}}

\footnote{\url{https://ctan.org/pkg/listingsutf8}}
\footnote{\url{https://ctan.org/pkg/listings}}
\footnote{\url{https://ctan.org/pkg/amsmath}}
3.6 Algorithms (hgbalgo.sty)

hgbalgo is a stand-alone package that is based on – and extends – the \texttt{algorithmicx} and \texttt{algpseudocode} packages. It fixes some (mostly indentation-related) problems, adds color and provides some additional commands. It also loads the \texttt{algorithm} package which defines a compatible float container for algorithms: \begin{algorithm} ... \end{algorithm}.

**Additional user commands:**

- \texttt{\State L\{<text>\}}: Creates a \textit{numbered} statement like \texttt{algorithmicx}'s \texttt{\State} command but provides consistent indentation on multi-line statements. Note that the statement \texttt{<text>} must be passed as a single argument in \{\ldots\} brackets.
- \texttt{\State NN[<nesting>]{<text>}}: Creates a \textit{non-numbered} statement like \texttt{algorithmicx}'s \texttt{\State} command but provides consistent indentation inside nested constructs and over multiple lines. The optional integer argument \texttt{<nesting>} can be used to specify the \textit{nesting depth} to compensate for a bug in \texttt{algorithmicx} (the nesting level inside a block is not set properly before the first \texttt{\State}). Omitting the optional argument should give correct indentation in most cases.
- \texttt{\Input\{<text>\}}: For describing the input parameters in a procedure’s preamble.
- \texttt{\Output\{<text>\}}: For describing the output values in a procedure’s preamble.
- \texttt{\Returns\{<text>\}}: For describing the return values in a procedure’s preamble.

**Defined algorithm colors:**

- \texttt{AlgKeywordColor} (for algorithm keywords),
- \texttt{AlgProcedureColor} (for procedure and function names),
- \texttt{AlgCommentColor} (for comments).

The above colors can be redefined at any time (see the \texttt{xcolor} package), e.g., by

\begin{verbatim}
\definecolor{AlgKeywordColor}{named}{black}
\definecolor{AlgProcedureColor}{rgb}{0.0, 0.5, 0.0}  % dark green
\end{verbatim}

4 Package dependencies

The \texttt{hagenberg-thesis} package builds on the following \LaTeX\ packages:

\texttt{abstract, algorithm, algorithmicx, algpseudocode, amsbsy, amsfonts, amsmath, amssymb, babel, biblatex, breakurl, caption, cmap, csquotes, datetime, enumitem, epstopdf, eurosym, exscale, fancyhdr, float, fontenc, geometry, graphicx, hypcap, hyperref, ifpdf, ifthen, inputenc, listingsutf8, lmodern, moreverb, overpic, pdfpages, pict2e, subdepth, titlesec, titling, tocbasic, url, upquote, verbatim, xcolor, xifthen, xspace}.