The `lipics` Class [*]

Schloss Dagstuhl

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1 Introduction

The `lipics` class assists in preparing articles for *Leibniz International Proceedings in Informatics* with LaTeX. It adapts LaTeX's standard `article` class to meet some requirements for LIPIcs and provides a specific layout.

The package consists of the following files:

`lipics.pdf` this documentation

`article.tex` the LaTeX master file, to be used as a template

`lipics.cls` the LaTeX class file, providing adaptions for LIPIcs and producing the layout

logos for LIPIcs, Creative Commons, and ORCID

This documentation is not intended to give an introduction to LaTeX. For questions concerning TeX systems/installations or the LaTeX mark-up language in general please visit www.tug.org, www.dante.de, uk.tug.org or any other TeX user group worldwide. The essential reference for LaTeX is *Mittelbach F., Goossens M. (2004) The LaTeX Companion. 2nd edn.*, but there are many other good books delivering insight into LaTeX.

`lipics` tries to benefit as far as possible from standard LaTeX packages. (Have a look at `lipics.cls` to see which packages are used.) Therefore, it should also be easy to compile an already written manuscript with the `lipics` layout. To learn more about the underlying packages we refer to their documentations (try e.g. `texdoc [package name]` at your shell prompt or visit tug.ctan.org).

2 How to use the package

We suggest to employ a recent TeX installation: the most important distributions, TeX Live, MiKTeX/proTeXt and MacTeX, all provide at least 2017 versions. But older versions should (in principle) work as well.

To use `lipics`, put "article.tex" and "lipics.cls" in your working directory, edit the file "article.tex" in your preferred text editor and run LaTeX as usual. (See the following section for more detailed advises.)

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[*]This file has version number v1.3, last revised 2017/12/20.

3 Some important settings and commands

3.1 Paper format

You can choose between the A4 format and the US-letter format. The respective options "`a4paper`" or "`letterpaper`" must be inserted in the optional argument of `\documentclass`.

3.2 Language

The document language is chosen in the optional argument of the `\documentclass` command in the LaTeX master file. Possible values are `USenglish`, `UKenglish` and many others.

3.3 Input encoding

`lipics` preselects UTF-8 as input encoding. Please do not change the input encoding because otherwise the volume compilation might become difficult.

3.4 Fonts

`lipics` uses the Latin Modern font family. This is a recent redesign of the good old Computer Modern fonts. Latin Modern provides a lot of characters and all neccessary math fonts. If your TeX installation does not provide the Latin Modern family, Computer Modern is used as a fallback.

`lipics` preloads the package "`amssymb`" to make additional mathematical symbols available. Other symbol packages, e.g. `stmaryrd`, may be added, of course. Moreover, the script math alphabet is provided by loading the `eucal` package. – But please avoid loading the `MnSymbol` package. (Note that the `lipics` removes all symbol re-definitions done by `MnSymbol` anyhow, but would retain its newly introduced symbol definitions.)

3.5 Titles

The prelims of a LIPIcs article is the only part where some specific commands are required:

- The title is tagged as usual with the `\title{...}` command. If you need a short form for the running head, use the optional `\titlerunning{...}`.

- Authors and their affiliations are rendered blockwise for LIPIcs[1]. The information for each author is to be tagged with a re-defiend `\author` macro which has the structure: `\author{name}{affil}{email}{orcid}{funding}`. – There is an additional `\authorrunning{...}` for the running header; it must be used.

- `\Copyright{...}` has just one argument for the copyright holder.

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[1] This has changed in 2017; the formerly used "authblk" mechanism to output authors and affilations in footnote style is deprecated; the `\affil` command is now obsolete for the lipics class.

- `\subjclass{...}` is for classification information following the ACM 2012 Computing Classification System; it is required, too.

- `\keywords{...}` must be used to capture keywords.

- `\category{...}` may be used to provide category information.

- `\relatedversion{...}` may be used to denote a related version.

- `\supplement{...}` may be used to denote supplements.

- `\funding{...}` may be used to capture a funding statement.

- `\acknowledgements{...}` may be used to capture an acknowledgement.

The commands mentioned so far should be used in the document preamble of the LaTeX file. Providing a title, at least one author, copyright information, subject classification, and keywords is required.

To typeset an abstract use `\begin{abstract}...\end{abstract}`. The environment must be placed after `\begin{document}` and `\maketitle`!

Note that subject classifications, keywords, ..., and acknowledgements will be rendered together with the abstract. So it is necessary to use the `abstract` environment in order to get the output for `\subjclass` etc.

The `\hideLIPIcs` command ist to mask all copyright information (and a possible DOI specification) on the first page.

3.6 Mathematical formulas

The `amsmath` package is preloaded, and you are encouraged to use the mark-up it provides instead of old-style standards like the `eqnarray` environment or the `\over` command.

3.7 Theorem-like environments

The `amsthm` package is preloaded, and the following environments are already introduced: `theorem`, `lemma`, `corollary`, `definition`, `example` and `remark`.

Setting up additional environments works with the `\newtheorem` mechanism from the `amsthm` package. For example, add to your document preamble

```
\theoremstyle{plain}
\newtheorem{conjecture}[theorem]{Conjecture}
```

See also the `amsthm` package documentation.

Available `\theoremstyles` are: `plain`, `definition`, and `remark` (all from the `amsthm` package, but slightly modified for LIPIcs).

Note that for LIPIcs all numbered theorem-like environments should use one and the same counter, i. e. the counter of the default environment "`theorem`".

By default, theorem-like environments are numbered consecutively throughout the document. To number the environments subordinately within sections use the class option "`numberwithinsect`".

3.8 Lists

List labels are set flush left. For enumerations with more than 9 items please insert \addtolength\leftmargini{0.5em} before \begin{enumerate}.

The enumerate package is preloaded, so you can use \begin{enumerate}[(a)] or the like.

Moreover, some enumerate environments are pre-defined: {romanenumerate}, {alphaenumerate}, and {bracketenumerate}.

3.9 Listings

The listings package is preloaded. It provides the lstlisting environment to typeset displayed code. Here, the package is configured to get a grey background for listings.

The following example shows how to use captions and labels with the lstlisting environment:

```
\begin{lstlisting}[caption={Useless code},label=list:8-6,float,
                                        abovecaptionskip=-\medskipamount]
for i:=maxint to 0 do
begin
    j:=square(root(i));
end;
\end{lstlisting}
```

Note also the float option to make the listing floating. Instead of the caption option one might prefer the title option which outputs the argument without the "Listing" label. To globally change the label name from "Listing", add to your document preamble e.g.

```
\renewcommand*\lstlistingname{Algorithm}
```

Please read the package documentation for more information on the lstlisting environment and how to adapt it locally.

3.10 Graphics

The standard interface for graphic inclusion is the \includegraphics command provided by the graphicx package. Note that the \graphicspath command allows to declare one or more folders where the graphicx package looks for the image files; so providing the path with each \includegraphics command is not necessary.

3.11 Tables

Preloaded packages are: the array package (for introducing new column types), the multirow package (row spanning cells) and the tabularx package (automatic column width calculation).

In order to allow easy use of table footnotes, the threeparttable package is preloaded. Please read the short documentation in threeparttables.sty to see how the related commands are applied.

3.12 Rotating floats

The preloaded `rotating` package provides the two environments "`sidewaysfigure`" and "`sidewaystable`". They allow the rotation of floating objects.

3.13 Sub-captions

The preloaded `subcaption` package provides the `\subcaption` command to add sub-captions. Please do not load the aged `subfig` package.

3.14 The `\ccsdesc` macro

Use `ccsdesc` to enter information according to the ACM Computing Classification System (CCS), e.g.
`\ccsdesc[500]{Information systems~Database management system engines}`.

3.15 Bibliography

It is recommended to use the standard bibliography mechanism. You might copy and paste your bibliography entries from elsewhere into the `thebibliography` environment or, more elegant, use BibTEX. For BibTEX, the standard bibliography style "plain" is sufficient. You might also use a similar bibliography style but please note that LIPIcs only allows numerical citation and forbids author-year citations. (So the `natbib` package is not used by `lipics`.)

3.16 Line numbers

The `lineno` package is loaded, and line numbering is switched on by default. To switch line numbering (globally) off, use `\nolinenumbers` (in the document preamble).

3.17 Adding further packages and new macros

Feel free to add further packages if you need extra structural mark-up. But keep in mind that you should not change the general layout of the article.

Happy TEXing!