The `lipics` Class *

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September 27, 2010

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-manual.pdf`: this documentation,
- `lipics-sample-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, and
- logos for LIPIcs and Creative Commons.

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 2009 versions. But older versions should (in principle) work as well.

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

*This file has version number v1.1, last revised 2010/09/27.

advises.) We suggest to use a PDF-based workflow, i.e., the usage of `pdflatex` in your LaTeX environment. Hence, the LIPIcs logos are provided in PDF format only. A DVI/PS-based workflow is not supported.

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.

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 separately for LIPIcs. Therefore, the standard LaTeX mechnism is replaced by the one of the `authblk` package: An author name is tagged with `\author` as usual. But this command has now an optional argument which may take the "footnote mark(s)" of associated affiliations, e.g. `\author[1,2]{John Q. Public}`. Any further authors are tagged with separate `\author` commands. The mark-up for affiliations is analogue: The command is `\affil`, with an obilgatory argument for the affiliation itself, and an optional argument which may capture a running number, e.g.: `\affil[1]{Department of ...\\... University\\... City\\jqpublic@univ.org}`. – If you need a

short form for the author names in the running head, use the optional `\authorrunning{...}`.

- `\Copyright[...]{...}` has an argument for the copyright holder and an optional argument to select a Creative Commons license, i.e. either "nd" or "nc-nd", e.g. `\Copyright[nd]{John Q. Public}`. (For information on Cerative-Commons licenses see creativecommons.org.)
- `\subjclass{...}` will output classification information, e.g. following the ACM 1998 Computing Classification System.
- `\keywords{...}` may be used to capture keywords.

The commands mentioned so far should be used in the document preamble of the LaTeX file. Providing a title and at least one author 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 and keywords will be rendered together with the abstract. So it is necessary to use the `abstract` environment in order to get the output for `\subjclass` and `\keywords`.

3.6 Mathematical formulas

The `amsmath` package is preloaded, and your 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 `\theoremstyle`s 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`: `\documentclass[numberwithinsect]{lipics}`.

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}`.

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 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`.)

3.14 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!