Preprint Template Title

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Abstract: This preprint template was created by Steffen W. R. Werner for consistent writing of research papers. It yields a suitable default for preprints uploaded to open servers like arXiv and may be used for that purpose. In the following, the use of the template is explained in more details with some example for easy use.

Keywords: keyword1, keyword2, keyword3

Mathematics subject classification: MSC1, MSC2, MSC3

Novelty statement: Here goes the actual novelty!

1 Introduction

In the following sections, I give guidelines on the preprint commands and options as well as a few examples how to use certain things. This should not be seen as a general introduction on "How to write papers with LaTeX". Also, the TeX file corresponding to this document can be used as starting point for writing your own paper in the preprint style.

In Section 2, the most important points, hidden in the class file, are described, where Section 2.1 contains main options that can be used for the template, Section 2.2 the link packages used by the class file, Section 2.3 infos on optional line numbering and Section 2.4 the (default) commands for meta information. Section 3 is a small summary of the necessary files for using the preprint template on other machines and Section 4 is then used for completeness of this file as a minimal example for preprints in this style.

2 Packages and commands

Let's talk here about the options, packages and commands in the template.

2.1 Class options

The following is an overview about supported options for the template that can be given to the document class to change its behavior:

a4paper Activates the default European A4 paper size.

letterpaper Activates the default American US letter paper size.

onecolumn Activates the single column style. `onecolumn` as option is equivalent to not using `twocolumn`.

twocolumn Activates the double column style. If not set the `onecolumn` style is the default.

hidelinks Turns off the coloring of any link in the paper, i.e., all links are printed in default text color.

colorlinks Turns on the coloring of links in the paper such that internal links are blue, external green and reference links are red.

monolinks Changes all links in the paper to be colored in blue.

linenumbers Activates line numbering in text.

As example, to use the preprint in double column style on A4 paper and with colored links you have to call:

```
\documentclass[a4paper,twocolumn]{preprint}
```

at the beginning of the main TeX file.

2.2 Links and hyperref packages

For links of internal and external kind, the template loads the packages `hyperref`, `url`, `doi` and `cleveref`. This allows the use of classical link commands as `\href`, `\url` and `\doi` if needed and their use by bibliography styles. For distinction, the external links are colored in green, the internal citation links in red and any internal reference will be given in blue. Since the coloring of links would also appear in print versions, there is the option for turning off the coloring; see Section 2.1.

For internal referencing, the commands from `cleveref` are recommended. The package is preloaded with the `nameinlink` and `capitalize` options such that names of environments are also part of the link and start with uppercase letters. Use `\Cref{...}` for any named environment as sections, figures, algorithms, tables or equations at the beginning of sentences and `\cref{...}` for default equation referencing in the text. By this, the environments are automatically put in by their right naming and number, e.g., if we want to reference to two sections we use

```
\Cref{sec1,sec2}
```

which gives could then give

Sections 1 and 2

automatically, or for example with the range of three sections

```
\Cref{sec1,sec2,sec3}
```

to get

Sections 1 to 3.

2.3 Line numbering

The line numbering of the text, which is turned on by the class option **linenumbers**, uses the `lineno` package. This has by default problems with math environments especially from other packages like `amsmath`. Therefore, a patch is integrated to automatically fix the line numbering for all math environments from plain LaTeXand the `amsmath` package. If you want to use the line numbering with other math environments, you can automatically patch those using the

```
\patchMATHlinenumbers{...}
```

command for allowing line numbering for your environment, e.g.,

```
\patchMATHlinenumbers{align}
```

is used in the class file to patch the `align` environment from `amsmath`. For other customization of the line numbering, have a look at the package documentation of the `lineno` package.

2.4 Commands for basic paper information

The template allows you to use a bunch of (default) article commands that should be used according to this example paper.

`\title{...}` Defines the title of the article.

`\author[...]{...}` Defines an author of the paper. The optional argument allows to set a footnote mark as number or symbol (e.g., 1 or `$\ast$`) to associate authors with affiliations. These authors should be given with full first and last names. The order of the authors in the TeX document determines the order of the authors on the paper.

`\affil[...]{...}` Defines affiliation for the authors. The optional argument allows to set a footnote mark as number or symbol (e.g., 1 or `$\ast$`) to associate authors with affiliations. The affiliation should have the following format

```
Address.\authorcr
\email{...}, \orcid{...}
```

such that email and ORCID are automatically formatted and linked.

`\shorttitle{...}` Is the optional running title of the paper printed on all pages starting with 2.

`\shortauthor{...}` Is the optional running authors of the paper printed on all pages starting with 2. Here, abbreviated first names should be used. For more then 3 authors, it's recommended to use the first author abbreviated and followed by an "et al." (without quotation marks).

`\shortdate{...}` Controls the content of the dates field in the lower right corner. If empty, the compilation date is used in ISO format (yyyy-mm-dd). Hiding the date is also possible by, e.g., using a non-breakable space `\shortdate{~}`.

`\shortinstitute{...}` Allows to set an optional institution in brackets behind "Preprint" in the lower left corner.

`\keywords{...}` Comma separated list of keywords. If not set, the bold face **Keywords:** below the abstract will not be shown.

`\msc{...}` Comma separated list of math subject classification identifiers. If not set, the bold face **Mathematics subject classification:** below the abstract will not be shown. See for example

https://zbmath.org/classification/

for the list of MSC identifiers.

`\abstract{...}` Shows the abstract text. Note that this is here only a command and not the classical abstract environment.

3 Export template for preprint server

To use the preprint on other machines, e.g., to give it to your co-authors or for the upload to a preprint server like *arXiv*, the `mypreprint.cls` file needs to be copied wherever needed. No further files are required. To compile the template, only basic LaTeXpackages given in any minimal *TeX Live* or *MiKTeX* installation are needed.

4 Other LaTeX stuff

Just for the completeness of the template example, here come a few of the usual things you see in other journal styles. Basically all following points are just reminders of basic LaTeXfor paper writing that also works in the preprint class.

4.1 Math environments

For proper referencing of equations, the template loads by default the `amsmath` package. The rest can be loaded as desired. Here, we will just demonstrate to reference equations with the `cleveref` package. Given those three equations

$$x = a + b, \tag{1}$$

$$c = \frac{1}{2x}, \tag{2}$$

$$V = \int_0^\infty CB\mathrm{d}t. \tag{3}$$

Then `\cref` should be used instead of `\eqref` for referring to a single equation (1) by

```
\cref{eqn:eqn1}
```

to a set of equations (1) and (3)

```
\cref{eqn:eqn1,eqn:eqn3}
```

and to a range of equations (1)–(3) by

```
\cref{eqn:eqn1,eqn,eqn:2,eqn:eqn3}.
```

Do not forget to put an unbreakable space ~ between the naming and `\cref`.

In case you actually need the environment written with the reference number use the uppercase `\Cref` as for other environments, e.g., Equations (1)–(3) is generated by

```
\Cref{eqn:eqn1,eqn,eqn:2,eqn:eqn3}.
```

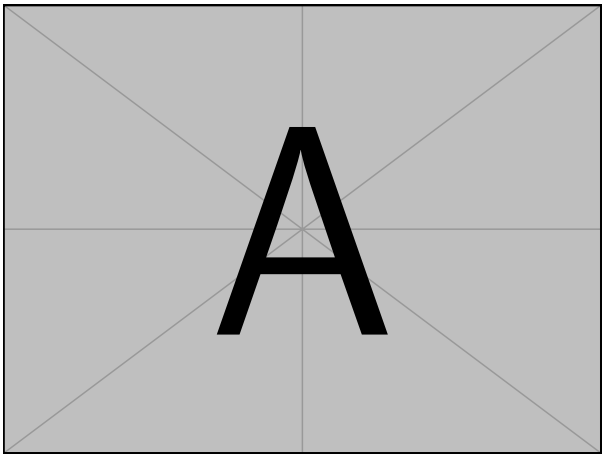

Figure 1: Example figure for template.

4.2 Reference lists

For the bibliography style it is recommended to use something that supports DOIs. In this example, the `plainurl` style is used. Citations can be done as usual using the `\cite` command. The template is preloading the `cite` package with the option `noadjust`. This allows automatic ordering of references in citation brackets and conversion to ranges of references if possible.

Citation of a single reference is then [1] with

```
\cite{ref1}
```

for two references in the wrong order [1, 3]

```
\cite{ref3,ref1}
```

and for ranges of references in any order [1–3]

```
\cite{ref2,ref1,ref3}
```

Remember to adjust the loaded BibTeX file to your needs and do not forget to put an unbreakable space ~ between the naming and `\cite`. Additionally, the references are added to the table of contents by

```
\addcontentsline{toc}{section}{References}
```

to give proper links in PDF viewers.

4.3 Graphics and TikZ

No special mentioning of fancy graphics or use of TikZ here. Just a simple example how an included graphic should look like with the corresponding `cleveref` reference Figure 1.

4.4 Tables

The same as for figures now with an example table Table 1. For demonstration, also an intermediate breaking horizontal line in the content is added. Note that table captions should go above the actual table.

Table 1: Example table

	header1	header2
row1	c1	c2
row2	c3	c4
row3	c5	c6

4.5 Numerical experiment sections

When using numerical experiments in a paper, the reproducibility of the results is extremely important. Therefore, you need to mention all used hardware and software in the introduction of the numerical examples section. For even better scientific practice, the source codes or scripts used in the computations should become available, e.g., by uploading on Zenodo. In this case, a code availability block should be added to the paper. An example for such a block can be seen below.

Code availability
The source codes and scripts used to compute the results presented in this paper can be obtained from

doi:?????/????????

under the ??? license and authored by ???.

A less standing out variant is to incorporate the above block as sentence with a reference to the code package. This can easily be copied by readers as reference in their works.

Acknowledgments

Towards the end, there can be an unnumbered section for the acknowledgments, stating people and organizations who influenced or funded the work in the paper. Note that this section is just created via

```
\section*{Acknowledgments}%
\addcontentsline{toc}{section}{Acknowledgments}
```


References

[1] A. Uthor1 and A. Uthor2. Title of example paper 1. *Journal*, Volume(Number):Pages, Year. doi:0000.000000.

[2] A. Uthor3, A. Uthor4, and A. Uthor5. *Title of the example book 1*, volume Volume of *Series*. Publisher, Address, Year. doi:0000.000000.

[3] A. Uthor5, A. Uthor6, and A. Uthor7. Title of the example arxiv preprint. e-print 0000.00000, arXiv, Year. my.class. URL: http://arxiv.org/abs/0000.00000.