

L^AT_EX document class for *Les Cahiers du GERAD* series

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Abstract

The `geradwp` document class was designed to allow researchers who are **GERAD**  members to write their working papers, preprints and technical reports in line with the presentation standards of *Les Cahiers du GERAD* working paper series. This class and the associated files replace the template that GERAD initially distributed.

1 Installing the class

1.1 Prerequisites

Using this class assumes you've already installed a \TeX distribution with an integrated code editor. In designing `geradwp`, the **TeX Live 2020**  distribution

and the [TeXstudio](#) editor were used.

If you are using TeXLive or [MacTeX](#) and your document compilation is buggy, begin by making sure your installation is up to date before investigating any further.

If you are using the [MikTeX](#) distribution, make sure you install the latest versions of the packages indicated in [Table 1](#) before using the `geradwp` class.

Users of [Overleaf](#) can also use this class by requesting the necessary files from GERAD.

1.2 Installation

The `.zip` archive you downloaded contains these files:

1. `geradwp.ins`: class installation file;
2. `geradwp.dtx`: documented source code for the class;
3. `geradwp.pdf`: the english version of the class' documentation;
4. `geradwp-fr.pdf` : the french version of the class' documentation;
5. `README.md`: file needed to display the class description on the [CTAN](#) website.

Follow these steps to install the class on your workstation.

1. Create a working directory;
2. unzip the `.zip` archive in your working directory;
3. open a command line terminal from the directory;
4. enter the following command:

```
latex geradwp.ins
```

This command will create the `geradwp.cls` class file and the `geradwp.tex` template from which you can draft your working paper.

2 Using the class

The `geradwp` class is derived from the basic `article` [↗](#) class. You can therefore use all of that class' functionalities. However, a few of the article class options are defined by default in the `geradwp` class and cannot be modified:

- The font size is 10pt;
- the paper size is `letterpaper`;
- printing is one-sided only (`oneside`) for the `gdweb` and `gdplain` versions of the template;
- printing is two-sided (`twoside`) for the `gdpaper` version of the template.

Since these options are defined in the class file, there is no risk of you deleting them from the template's `documentclass` command. Just make sure not to enter any options that might conflict with the above-mentioned options.

2.1 Options

In addition to the options available via the `article` class, there are a few options available for `geradwp`.

<code>gdweb</code>	The Web version of a paper that is to be posted on the GERAD website. The <code>oneside</code> option is passed on to the <code>article</code> class.
<code>gdpaper</code>	The paper version of an article that is to be printed and placed in the GERAD documentation centre. The <code>twoside</code> option is passed on to the article class.
<code>gdplain</code>	The unformatted version of a paper, similar to a basic L ^A T _E X article, that is to be distributed by the author. The <code>oneside</code> option is passed on to the article class.
<code>gdrevised</code>	When a paper is revised by the authors, this option is used to display the revision date on the paper's cover page.
<code>gdfinal</code>	During the drafting and revision process, a 5 pt <code>overfullrule</code> is printed in the right-hand margin to indicate any parts of the paper that go outside the margin. Once these two processes are done, this option is used to remove the document's <code>overfullrule</code> .
<code>gdsmallhead</code>	Some packages have fun at our expense by modifying the paper's header. The <code>gdsmallhead</code> option corrects this by resetting the proper header.
<code>gdpostpub</code>	Once a paper's content is published by a publisher, the paper must be updated to show the new publication's information on the cover page. The <code>gdpostpub</code> option swaps out the <i>Cahier's</i> citation for the publisher's official one and the article URL for the <i>Cahier's</i>

`gdmintabs` Authors sometimes create tables so large that they extend beyond the margins. To solve this issue, the `gneedsminintabs` option can be used to set the tables in the document to `footnotesize`.

2.2 Using packages

Since the goal of this class is to make sure that working papers use a consistent layout, very few packages are preloaded. Table 1 lists those that are preloaded, along with the files where you will find them (and their options, where applicable). Researchers can choose to use whichever packages they will need, taking into account their features (see below). Care should be taken not to reload any of them or to change any of the default options.

Package	Class file	Template	Options
amssymb	✓		
amsmath	✓		
amsfonts	✓		
latexsym	✓		
graphicx	✓		graphicspath=Figures
mathrsfs	✓		
geometry	✓		
fancyhdr	✓		
booktabs	✓		
multirow	✓		
array	✓		
caption	✓		font={footnotesize,bf,sf}
color	✓		
enumitem	✓		
float	✓		
algorithm		✓	
algorithm2e		✓	
hyperref		✓	colorlinks citecolor={blue} urlcolor={blue} breaklinks={true}

Table 1: List of the class' preloaded packages along with their location and options

2.2.1 babel

The person maintaining the original template advised the author of this document class that using babel with the template causes a number of problems, so **please do not use the babel package with this new template**, until these issues have been fixed. A future release of the class may allow you to use it.

2.2.2 algorithm, algorithm2e

[algorithm](#) and [algorithm2e](#) are two different packages, each of which has its fans among the *Cahiers du GERAD* authors. Both are accepted and loaded in the preamble of the template. Simply comment out the one that will not be used.

The two packages are mutually exclusive and cannot both be loaded at once without causing bugs.

2.2.3 float

The `float` package is loaded with the class **only when the `gdmintabs` option is enabled**. When loaded, it resizes the tables in `footnotesize`. If you need this package and the tables are reasonably small, you can load it in the preamble of the document.

2.2.4 cleveref

The template already includes the `amsthm` package to allow referencing of theorems. However, in order for them to appear when using the `cleveref` package, `\newtheorem` definitions must be placed **after** the `cleveref` package is loaded (as specified in Section 14.1 of the [cleveref package documentation](#)).

2.3 Commands

The handful of public commands that were created for this class have two purposes: formatting and filling in metadata for the working paper.

2.3.1 Metadata

All located in the preamble, the metadata commands allow authors and the GERAD team to insert the bibliographical data that will be found on the cover and title pages of the paper.

<code>\GDtitre</code>	Title of the working paper. The title is on both the cover and title pages.
<code>\GDauteursCourts</code>	List of authors, formatted as <i>[First initial]. [Last name]</i> (e.g.: B. Hamel, K. Hébert). The contents of this command will be found on the title page, under the title.
<code>\GDauteursCopyright</code>	List of the authors' last names for the authors' copyright notice at the bottom of the title page.
<code>\GDmois</code>	Publication month of the working paper in both French and English. The

month for the French version is in the first set of curly brackets and the English one in the second.

<code>\GDannee</code>	The year the paper was published, formatted as YYYY.
<code>\GDnumero</code>	Number assigned to the working paper by the GERAD team.
<code>\GDrevised</code>	When a working paper is revised by its authors, this command is used to display the revision date on the cover page.
<code>\GDpostpubcitation</code>	When the working paper is officially published, the GERAD team will replace the <i>Cahier</i> 's citation with the official journal citation and replace the link to the GERAD website with the URL from the publisher. The citation must be placed in the first set of curly brackets and the URL in the second.

2.3.2 Formatting

To keep the template from getting cluttered and to keep authors from deleting critical formatting commands, commands were created to mark each subdivision of the document.

<code>\GDpageCouverture</code>	The entire cover page is generated with this command. It is largely formatted with the formatting commands listed in subsubsection 2.3.1 . The title page that follows the cover is generated by the <code>GDpagetitre</code> environment described in subsection 2.4 .
<code>\GDabstracts</code>	This command marks the beginning of the “content” section, beginning with the English and French abstracts. It configures the page headers and footers, which are used throughout the paper, including the metadata described in subsubsection 2.3.1 . The abstracts are written in the <code>GDabstract</code> environment described in subsection 2.4 .
<code>\GDarticlestart</code>	The working paper begins with this command. It handles some final fine-tuning of the formatting settings.

2.4 Environments

A few environments were created to quickly format the title page and the abstracts section.

2.4.1 Title page

<code>GDpagetitre</code>	The entire title page is generated via this environment. To create the page, authors only need to type their personal information in the <code>GDauthlist</code> , <code>GDaffillist</code> , and <code>GDemaillist</code> environments described below.
<code>GDauthlist</code>	The <code>GDauthlist</code> environment is a customized list in which the authors enter
<code>\GDauthitem</code>	
<code>\GDrefsep</code>	

their full name using the `\GDauthitem` command (NB: one author per line). The authors can link their affiliations with the `\ref{}` command, as demonstrated in [Source Code 1](#). In the event that an author has more than one affiliation, they must use one `\ref{}` command per affiliation, separating each one with a `\GDrefsep` command.

Source Code 1: Authors list example

```
1 \begin{GDauthlist}
2   \GDauthitem{Benoit Hamel\ref{affil:hec}}
3   \GDauthitem{Karine H\ref{affil:gerad}\GDrefsep\ref{affil:hec}}
4 \end{GDauthlist}
```

`GDaffillist` The `GDaffillist` environment is a customized list of all the authors' affiliations, in no predefined order of importance. Each affiliation is written with a `\GDaffilitem` command with the label of the affiliation entered between the first set of curly brackets, and the affiliation itself in the second, as shown in [Source Code 2](#).

Source Code 2: Affiliations list example

```
5 \begin{GDaffillist}
6   \GDaffilitem{affil:hec}{HEC Montr'\eal}
7   \GDaffilitem{affil:gerad}{GERAD}
8 \end{GDauthlist}
```

`GDemaillist` The final customized list created for the title page of a *Cahier* is the `GDemaillist` environment, where the authors' email addresses are listed, with one email address per `\GDemailitem` command.

Source Code 3: Email list example

```
9 \begin{GDemaillist}
10  \GDemailitem{benoit.2.hamel@hec.ca}
11  \GDemailitem{karine.hebert@gerad.ca}
12 \end{GDauthlist}
```

2.4.2 Abstracts section

`GDabstract` In a GERAD working paper, the French and English abstracts are written in a single paragraph. Even though it would have been simpler to write only one `\paragraph` command per abstract in the template, the authors of the class chose to use the “environment” format in order to add formatting and remain consistent with the behaviour of the abstract environment.

`GDacknowledgements` In a GERAD working paper, the acknowledgements are in a distinct block

of text that does not match what the `\thanks` command yields in terms of formatting. The authors therefore must write all their acknowledgements in the `GDacknowledgements` environment, and the `geradwp` class will handle the layout according to the chosen version.

3 The `geradwp.tex` template

The `geradwp.tex` template was designed to be as simple as possible and is divided in a way that makes the source code of each paper uniform. Here is a brief presentation of the different sections.

3.1 Default packages (lines 104-117)

All the packages that are not loaded by default in the class (see [Table 1](#)) are loaded in this section. It's in this section that the choice between the `algorithm` and `algorithm2e` packages is made. Also, this is where you should load the packages that tend to malfunction if they are loaded after the `hyperref` package.

3.2 Default options (lines 118-132)

If the name of your folder containing your paper's figures is named differently than the default name, or if there are multiple folders with figures in them, this is where you can enter that information.

If you want to add `hypersetup` options without modifying or removing the default ones, you can do that here.

In all other cases, this section should remain unchanged.

3.3 Author commands (lines 133-141)

This section belongs entirely to the author. This is where all the packages needed for the paper can be loaded, as well as their options.

This is also where customized commands, environments, and theorems can be entered.

3.4 Metadata (lines 143-155)

This section is divided in two: the first is at the end of the preamble, and the second in the `GDpagetitre` environment located at the beginning of the document. This is where all the bibliographical metadata for the paper should be.

3.5 Abstracts, keywords, acknowledgements, article (starting at line 156)

These last two sections are, of course, where the body of the article will be.

A Class source code

In this appendix, you will find the source code for the `geradwp` class. If you're interested to see how it's programmed, or help with debugging or improving the class, this section is for you.

A.1 Tests and boolean values

To do conditional tests, the class uses the `ifthen` package. The boolean variables identify which version of the paper to generate, how far in the publication process the paper is and it configures some parts of the formatting. Once the variables have been created, default values are set.

```
1 \<class>
2 \RequirePackage{ifthen}
3
4 % Booleans %
5 \newboolean{GD@isWebVersion}
6 \newboolean{GD@isPaperVersion}
7 \newboolean{GD@isPlainVersion}
8 \newboolean{GD@needsSmallHeadSep}
9 \newboolean{GD@isFinalImpression}
10 \newboolean{GD@isPostPublication}
11 \newboolean{GD@isRevised}
12 \newboolean{GD@needsminitabs}
13
14 \setboolean{GD@isWebVersion}{false}
15 \setboolean{GD@isPaperVersion}{true}
16 \setboolean{GD@isPlainVersion}{false}
17 \setboolean{GD@needsSmallHeadSep}{false}
18 \setboolean{GD@isFinalImpression}{false}
19 \setboolean{GD@isPostPublication}{false}
20 \setboolean{GD@isRevised}{false}
21 \setboolean{GD@needsminitabs}{false}
```

A.2 Class options

The few class options are declared here. They essentially change some boolean values and pass some options to the `article` class.

```
22
23 % Class Options %
24 \DeclareOption{gdweb}{%
25 \setboolean{GD@isWebVersion}{true}
26 \setboolean{GD@isPaperVersion}{false}
27 \setboolean{GD@isPlainVersion}{false}
28 \PassOptionsToClass{oneside}{article}
29 }
30 \DeclareOption{gdpaper}{%
31 \setboolean{GD@isWebVersion}{false}
32 \setboolean{GD@isPaperVersion}{true}
33 \setboolean{GD@isPlainVersion}{false}
34 \PassOptionsToClass{twoside}{article}
35 }
36 \DeclareOption{gdplain}{%
37 \setboolean{GD@isWebVersion}{false}
38 \setboolean{GD@isPaperVersion}{false}
39 \setboolean{GD@isPlainVersion}{true}
40 \PassOptionsToClass{oneside}{article}
41 }
42 \DeclareOption{gdsmlhead}{%
43 \setboolean{GD@needsSmallHeadSep}{true}
44 }
45 \DeclareOption{gdfinal}{%
46 \setboolean{GD@isFinalImpression}{true}
47 }
48 \DeclareOption{gdpostpub}{%
49 \setboolean{GD@isPostPublication}{true}
50 }
51 \DeclareOption{gdrevised}{%
52 \setboolean{GD@isRevised}{true}
53 }
54 \DeclareOption{gdminitabs}{%
55 \setboolean{GD@needsminitabs}{true}
56 }
```

A.3 Loading the class

The class is loaded in the document with all the user-defined or default values.

```
57
58 % Standard Class Loading %
59 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{article}}
```

```

60 \ProcessOptions\relax
61 \LoadClass[letterpaper,10pt]{article}

```

A.4 Default packages and their options

Very few packages are loaded with the class in order to allow the user to write with the greatest possible flexibility. The packages that are loaded, however, ensure that all the papers in the collection have consistent formatting.

```

62
63 % Required Packages %
64 \RequirePackage{amssymb}
65 \RequirePackage{amsmath}
66 \RequirePackage{amsthm}
67 \RequirePackage{amsfonts}
68 \RequirePackage{latexsym}
69 \RequirePackage{graphicx}
70 \RequirePackage{mathrsfs}
71 \RequirePackage{geometry}
72 \RequirePackage{fancyhdr}
73 \RequirePackage{booktabs}
74 \RequirePackage{multirow}
75 \RequirePackage{array}
76 \RequirePackage[font={footnotesize,bf,sf}]{caption}
77 \RequirePackage{color}
78 \RequirePackage{enumitem}
79 \ifthenelse{\boolean{GD@needsminitabs}}{%
80 \RequirePackage{float}
81 }{}
82
83 % Required Packages Setup %
84 \definecolor{gris}{rgb}{0.44,0.44,0.44} % color pkg setup
85 \captionsetup[table]{skip=5pt} % caption pkg setup

```

A.5 Formatting

We begin by defining the lengths of the document. These can change from one version of the paper to another.

```

86
87 % Lengths %
88 \newlength{\GD@authitemsep}
89 \newlength{\GD@authtopsep}
90 \newlength{\GD@affilitemsep}
91 \newlength{\GD@affiltopsep}
92 \newlength{\GD@titleminipage@hspace}
93 \newlength{\GD@titleminipage@upper@vspace}

```

```

94 \ifthenelse{\boolean{GD@isPlainVersion}}{%
95 \setlength{\GD@authitemsep}{0pt}
96 \setlength{\GD@authtopsep}{12pt}
97 \setlength{\GD@affilitemsep}{0pt}
98 \setlength{\GD@affiltopsep}{9pt}
99 }{%
100 \setlength{\GD@authitemsep}{8pt}
101 \setlength{\GD@authtopsep}{24pt}
102 \setlength{\GD@affilitemsep}{6pt}
103 \setlength{\GD@affiltopsep}{9pt}
104 }
105 \ifthenelse{\boolean{GD@isPaperVersion}}{%
106 \setlength{\GD@titleminipage@hspace}{240pt}
107 }{}
108 \ifthenelse{\boolean{GD@isWebVersion}}{%
109 \setlength{\GD@titleminipage@hspace}{227pt}
110 }{}
111 \ifthenelse{\boolean{GD@isWebVersion}}{%
112 {\setlength{\GD@titleminipage@upper@vspace}{75pt}}%
113 {\setlength{\GD@titleminipage@upper@vspace}{197pt}}

```

We then set up the geometry of the document, which varies from one version to another.

```

114
115 % Geometry %
116 \ifthenelse{\boolean{GD@isWebVersion}}{%
117 \geometry{tmargin=1.5cm,%
118 bmargin=2cm,%
119 lmargin=3cm,%
120 rmargin=3cm,%
121 nofoot,%
122 headsep=30pt,%
123 includehead}
124 }{}
125 \ifthenelse{\boolean{GD@isPlainVersion}}{%
126 \geometry{tmargin=1.5cm,%
127 bmargin=2cm,%
128 lmargin=3cm,%
129 rmargin=3cm,%
130 nofoot,%
131 headsep=30pt,%
132 includehead}
133 }{}
134 \ifthenelse{\boolean{GD@isPaperVersion}}{%
135 \geometry{tmargin=1.5cm,%
136 bmargin=2cm,%
137 lmargin=3cm,%
138 rmargin=2cm,%
139 nofoot,%

```

```

140 headsep=30pt,%
141 includehead}
142 }{}
143 \ifthenelse{\boolean{GD@needsSmallHeadSep}}{%
144 \headsep=15pt
145 }{}
146 \parindent=15pt
147 \parskip=7pt plus 1pt minus 1pt
148 \g@addto@macro{\floatboxreset}{centering}
149 \widowpenalty=10000
150 \clubpenalty=10000
151 \raggedbottom
152 \allowdisplaybreaks

```

We add a touch of consistency by modifying the section headers, going down the hierarchy all the way down to `\paragraph`. Among other changes, we assign the font `\sffamily` to the headers, theorems, and proof.

```

153
154 % Section headings %
155 \renewcommand{\section}{\@startsection {section}{1}{\z@}%
156 {-2ex \@plus -1ex \@minus -.2ex}%
157 {1ex \@plus .2ex}%
158 {\normalfont\Large\sffamily\bfseries}}
159 \renewcommand{\subsection}{\@startsection{subsection}{2}{\z@}%
160 {-1.25ex\@plus -1ex \@minus -.2ex}%
161 {.75ex \@plus .2ex}%
162 {\normalfont\large\sffamily\bfseries}}
163 \renewcommand{\subsubsection}{\@startsection{subsubsection}{3}%
164 {\z@}%
165 {-1.25ex\@plus -1ex \@minus -.2ex}%
166 {.75ex \@plus .2ex}%
167 {\normalfont\normalsize\sffamily\bfseries}}
168 \renewcommand{\paragraph}{\@startsection{paragraph}{4}{\z@}%
169 {-1.25ex \@plus 1ex \@minus -.2ex}%
170 {-.5em \@plus -.1em}%
171 {\normalfont\normalsize\sffamily\bfseries}}
172 \setlength{\partopsep}{.5ex \@plus .1ex} %% to reduce spaces
173 \def\@listI{\leftmargin\leftmarginI %% above, between and under
174 \parsep .25ex \@plus .1ex %% lists - itemize
175 \topsep .25ex \@plus .1ex %% description - enumerate
176 \itemsep \parsep}
177 \let\@listi\@listI
178 \@listi

```

We resize oversized tables that extend past the margins.

```

179
180 % Resizing of huge tables %
181 \ifthenelse{\boolean{GD@needsminitabs}}{%

```

```

182 \floatstyle{plaintop}
183 \restylefloat{table}
184 \let\oldtabular\tabular
185 \renewcommand{\tabular}{\footnotesize\oldtabular}
186 \let\oldtable\table
187 \{}

```

Finally, we adjust the formatting of the theorems and of the `proof` environment so they are consistent with everything else.

```

188
189 % Theorems and proof layout %
190 \newtheoremstyle{gerad}%
191 {3pt}% Space above
192 {3pt}% Space below
193 {}{}%
194 {\sffamily\bfseries}% head font
195 {.%}% Punctuation
196 {.5em}% Space after theorem head
197 {}
198 \theoremstyle{gerad}
199
200 \renewenvironment{proof}[1][\proofname]{\par
201 \pushQED{\qed}%
202 \normalfont \topsep6\p@\@plus6\p@\relax
203 \trivlist
204 \item\relax
205 {\bfseries\sffamily
206 #1\@addpunct{.}}\hspace\labelsep\ignorespaces
207 }{}%
208 \popQED\endtrivlist\@endpfalse
209 }

```

A.6 Private class commands

Private commands play two separate roles: 1) storing and reusing the document's metadata; 2) isolate large blocks of code to prevent code duplication.

A.6.1 Metadata

The following commands store the metadata in the associated public commands and populate different parts of the paper such as the headers, cover page and title page.

```

210
211 % Class Private Commands %
212 % Metadata %

```

```

213 \newcommand{\gd@annee}{ }
214 \newcommand{\gd@mois}{ }
215 \newcommand{\gd@month}{ }
216 \newcommand{\gd@numero}{ }
217 \newcommand{\gd@titre}{ }
218 \newcommand{\gd@auteurs@short}{ }
219 \newcommand{\gd@auteurs@copyright}{ }
220 \newcommand{\gd@postpubcitation}{ }
221 \newcommand{\gd@postpubcitation@url}{ }
222 \newcommand{\gd@revised}{ }

```

A.6.2 Cover and title pages

The cover page and the title page change according to the version of the paper being generated and its publication stage. Rather than duplicating code, the cover and title pages have been separated into sections that are called up with the criteria mentioned above.

The cover page displays in every version of the paper except `gdplain`. The following commands define its appearance. The bottom part of the page is different if the `gdpostpub` option is used.

```

223
224 % Cover page
225 \newcommand{\GD@cover}{%
226 \ifthenelse{\boolean{GD@isFinalImpression}}{ }{%
227 \overfullrule=5pt
228 }
229
230 \pagestyle{empty}
231 \begin{titlepage}
232 \sffamily
233 \ifthenelse{\boolean{GD@needsSmallHeadSep}}{ }{%
234 \vspace*{35pt}
235 } }
236
237 {\noindent{\large\bfseries Les Cahiers du GERAD}\hfill ISSN:\quad
238 0711--2440}
239 \ifthenelse{\boolean{GD@isWebVersion}}{ }{%
240
241 \vspace*{54pt}
242 {\noindent\large\bfseries \gd@titre\par} %Title
243
244 \vspace*{18pt}
245 {\noindent\Large\gd@auteurs@short\par}
246 } }
247
248 \vspace*{\GD@titleminipage@upper@vspace}
249 \hspace*{\GD@titleminipage@hspace}

```



```

250 \begin{minipage}[c][5.4cm][c]{7cm}
251 {\ifthenelse{\boolean{GD@isWebVersion}}{%
252 {\GDcover@minipagetable@web}%
253 {\GDcover@minipagetable@paper}%
254 }
255 \end{minipage}
256
257 \vfill
258
259 \ifthenelse{\boolean{GD@isPostPublication}}{%
260 \GDcover@bottom@postpub
261 }{%
262 \GDcover@bottom@regular
263 }
264 \end{titlepage}
265 }
266
267 % Cover page minipage table (web version)
268 \newcommand{\GDcover@minipagetable@web}{%
269 \begin{tabular}{p{.5cm}|p{5.5cm}}
270 & \normalsize G--\gd@annee--\gd@numero
271 \ifthenelse{\boolean{GD@needsminitabs}}{%
272 {\*\*{10pt}}%
273 {\*\*{8pt}}
274 & \normalsize\gd@month\ \gd@annee
275 \ifthenelse{\boolean{GD@isRevised}}{%
276 \\\
277 & \normalsize Revised: \gd@revised
278 }{}
279 \end{tabular}
280 }
281
282 % Cover page minipage table (paper version)
283 \newcommand{\GDcover@minipagetable@paper}{%
284 \begin{tabular}{p{.5cm}|p{5.5cm}}
285 \multicolumn{2}{p{6.5cm}}{\normalsize\bfseries \gd@titre
286 \ifthenelse{\boolean{GD@needsminitabs}}{%
287 {\vspace*{12.5pt}}%
288 {\vspace*{10pt}}}\\\
289 & \normalsize\gd@auteurs@short \\\ %Initials. Name
290 & \ifthenelse{\boolean{GD@needsminitabs}}{%
291 {\*\*{15pt}}%
292 {\*\*{12pt}}
293 & \normalsize G--\gd@annee--\gd@numero
294 \ifthenelse{\boolean{GD@needsminitabs}}{%
295 {\*\*{10pt}}%
296 {\*\*{8pt}}
297 & \normalsize\gd@month\ \gd@annee
298 \ifthenelse{\boolean{GD@isRevised}}{%
299 \\\

```

300 &\normalsize Revised: \gd@revised
 301 }{}
 302 \end{tabular}
 303 }
 304
 305 % Regular cover page bottom
 306 \newcommand{\GDcover@bottom@regular}{%
 307 \hrule
 308 \smallskip
 309
 310 \noindent\begin{minipage}[t][l]{7.5cm}
 311 \scriptsize
 312 La collection \textit{Les Cahiers du GERAD} est constitu\''e des
 313 travaux de recherche men\''s par nos membres. La plupart de ces
 314 documents de travail a \''t\''e soumis \''a des revues avec
 315 comit\''e de r\''e vision. Lorsqu'un document est accept\''e et
 316 publi\''e, le pdf original est retir\''e si c'est n\''cessaire et
 317 un lien vers l'article publi\''e est ajout\''e.\\
 318
 319 \medskip
 320 \scriptsize
 321 \textbf{Citation sugg\''e r\''e :} \gd@auteurs@short~(\gd@mois\
 322 \gd@annee). \gd@titre, Rapport technique, Les Cahiers du GERAD G--
 323 \gd@annee--\gd@numero, GERAD, HEC Montr\''e al, Canada.\\
 324
 325 \textbf{Avant de citer ce rapport technique,} veuillez visiter notre
 326 site Web (\url{https://www.gerad.ca/fr/papers/G-\gd@annee-\gd@numero})
 327 afin de mettre \''a jour vos donn\''ees de r\''ef\''erence, s'il a \''et\''e
 328 publi\''e dans une revue scientifique.\par
 329 \end{minipage}
 330 \hfill
 331 \begin{minipage}[t][l]{7.5cm}
 332 \scriptsize
 333 The series \textit{Les Cahiers du GERAD} consists of working papers
 334 carried out by our members. Most of these pre-prints have been submitted
 335 to peer-reviewed journals. When accepted and published, if necessary,
 336 the original pdf is removed and a link to the published article is
 337 added.\\ \\
 338
 339 \scriptsize
 340 \textbf{Suggested citation:} \gd@auteurs@short~(\gd@month\ \gd@annee).
 341 \gd@titre, Technical report, Les Cahiers du GERAD G--\gd@annee--\gd@numero,
 342 GERAD, HEC Montr\''e al, Canada.\\
 343
 344 \textbf{Before citing this technical report,} please visit our website
 345 (\url{https://www.gerad.ca/en/papers/G-\gd@annee-\gd@numero}) to update
 346 your reference data, if it has been published in a scientific journal.
 347 \par
 348 \end{minipage}
 349

350 \bigskip
351 \hrule
352 \smallskip
353
354 \noindent\begin{minipage}[t][2.1cm][l]{7.5cm}
355 \scriptsize
356 La publication de ces rapports de recherche est rendue possible gr\^ace
357 au soutien de HEC Montr\'eal, Polytechnique Montr\'eal, Universit\'e
358 McGill, Universit\'e du Qu\'ebec \'a Montr\'eal, ainsi que du Fonds de
359 recherche du Qu\'ebec -- Nature et technologies.
360
361 \medskip
362 D\'ep\^ot l\'egal -- Biblioth\'eque et Archives nationales du Qu\'ebec,
363 \gd@annee\\
364 -- Biblioth\'eque et Archives Canada, \gd@annee
365 \par
366 \end{minipage}
367 \hfill
368 \begin{minipage}[t][2.1cm][l]{7.5cm}
369 \scriptsize
370 The publication of these research reports is made possible
371 thanks to the support of HEC Montr\'eal, Polytechnique Montr\'eal,
372 McGill University, Universit\'e du Qu\'ebec \'a Montr\'eal, as well as
373 the Fonds de recherche du Qu\'ebec -- Nature et technologies.
374
375 \medskip
376 Legal deposit -- Biblioth\'eque et Archives nationales du Qu\'ebec,
377 \gd@annee\\
378 -- Library and Archives Canada, \gd@annee\par
379 \end{minipage}
380
381 \hrule
382 \smallskip
383
384 \noindent
385 \begin{minipage}[t][1cm][l]{7.5cm}
386 \begin{scriptsize}\raggedleft
387 \textbf{GERAD} HEC Montr\'eal
388
389 3000, chemin de la C\^ote-Sainte-Catherine
390
391 Montr\'eal (Qu\'ebec) Canada H3T 2A7\par
392 \end{scriptsize}
393 \end{minipage}
394 \hspace*{.35cm}\vrule\hfill
395 \begin{minipage}[t][1cm][l]{7.5cm}
396 \begin{scriptsize}
397 \textbf{T\'el.},: 514 340-6053
398
399 T\'el\'ec.},: 514 340-5665

```

400
401 info@gerad.ca
402
403 www.gerad.ca\par
404 \end{scriptsize}
405 \end{minipage}
406
407 \bigskip
408 \hrule
409 }
410
411 % Post-publication cover page bottom
412 \newcommand{\GDcover@bottom@postpub}{%
413 \hrule
414 \smallskip
415
416 \noindent
417 \begin{minipage}[t][l]{7.5cm}
418 \scriptsize
419 La collection \textit{Les Cahiers du GERAD} est constitu\''e des
420 travaux de recherche men\''es par nos membres. La plupart de ces
421 documents de travail a \''{e}t\''{e} soumis \''{a} des revues avec comit\''e
422 de r\''{e}vision. Lorsqu'un document est accept\''{e} et publi\''{e}, le
423 pdf original est retir\''{e} si c'est n\''{e}cessaire et un lien vers
424 l'article publi\''{e} est ajout\''{e}.\par
425 \end{minipage}
426 \hfill
427 \begin{minipage}[t][l]{7.5cm}
428 \scriptsize
429 The series \textit{Les Cahiers du GERAD} consists of working papers
430 carried out by our members. Most of these pre-prints have been submitted
431 to peer-reviewed journals. When accepted and published, if necessary,
432 the original pdf is removed and a link to the published article is
433 added.\par
434 \end{minipage}
435
436 \noindent
437 \begin{minipage}[t][l]{\textwidth}
438 \footnotesize
439 \textbf{CITATION ORIGINALE / ORIGINAL CITATION}
440 \smallskip
441
442 \gd@postpubcitation\ \url{\gd@postpubcitation@url}.
443 \end{minipage}
444
445 \bigskip
446
447 \hrule
448 \smallskip
449

```

450 \noindent
 451 \begin{minipage}[t][2.1cm][l]{7.5cm}
 452 \scriptsize
 453 \medskip
 454 La publication de ces rapports de recherche est rendue possible gr[^]ace
 455 au soutien de HEC Montr[']eal, Polytechnique Montr[']eal, Universit[']e
 456 McGill, Universit[']e du Qu[']ebec \a Montr[']eal, ainsi que du Fonds de
 457 recherche du Qu[']ebec -- Nature et technologies.
 458
 459 \medskip
 460 D[']ep[^]ot l[']egal -- Biblioth[']eque et Archives nationales du Qu[']ebec,
 461 2020\\
 462 -- Biblioth[']eque et Archives Canada, 2020\par
 463 \end{minipage}
 464 \hfill
 465 \begin{minipage}[t][2.1cm][l]{7.5cm}
 466 \scriptsize
 467 \medskip
 468 The publication of these research reports is made possible
 469 thanks to the support of HEC Montr[']eal, Polytechnique Montr[']eal,
 470 McGill University, Universit[']e du Qu[']ebec \a Montr[']eal, as well as
 471 the Fonds de recherche du Qu[']ebec -- Nature et technologies.
 472
 473 \medskip
 474 Legal deposit -- Biblioth[']eque et Archives nationales du Qu[']ebec,
 475 2020\\
 476 -- Library and Archives Canada, 2020\par
 477 \end{minipage}
 478
 479 \hrule
 480 \smallskip
 481
 482 \noindent
 483 \begin{minipage}[t][1cm][l]{7.5cm}
 484 \begin{scriptsize}\raggedleft
 485 \textbf{GERAD} HEC Montr[']eal
 486
 487 3000, chemin de la C[^]ote-Sainte-Catherine
 488
 489 Montr[']eal (Qu[']ebec) Canada H3T 2A7\par
 490 \end{scriptsize}
 491 \end{minipage}
 492 \hspace*{.35cm}\vrule\hfill
 493 \begin{minipage}[t][1cm][l]{7.5cm}
 494 \begin{scriptsize}
 495 \textbf{T[']el.},: 514 340-6053
 496
 497 T[']el[']ec.},: 514 340-5665
 498
 499 info@gerad.ca

```

500
501 www.gerad.ca\par
502 \end{scriptsize}
503 \end{minipage}
504
505 \bigskip
506 \hrule
507 }

```

The title page appears in all versions of the paper, but it varies according to the version. Given that it is contained in the `GDpagetitre` environment, the internal commands for the title page's display are divided into two parts: `@begin` and `@end`.

```

508
509 % Regular title page
510 \newcommand{\GD@titrepage@begin}{%
511 \ifthenelse{\boolean{GD@isWebVersion}}{%
512 \newpage\clearpage
513 }{%
514 \ifthenelse{\boolean{GD@isPaperVersion}}{%
515 \newpage\cleardoublepage
516 }{}
517 }
518 \parindent=0pt
519 \sffamily
520 {\LARGE\bfseries \gd@titre\par} %Title
521 \begin{minipage}[t][10cm][l]{7.5cm}
522 \vspace*{55pt}
523 }
524
525 \newcommand{\GD@titrepage@end}{%
526 \vfill
527 \end{minipage}
528 \vfill
529 {\bfseries \gd@month\ \gd@annee}\\*
530 \ifthenelse{\boolean{GD@isRevised}}{%
531 {\ \gd@revised \}%
532 {}
533 {\bfseries Les Cahiers du GERAD}\\
534 {\bfseries G--\gd@annee--\gd@numero}\\
535 {\footnotesize Copyright \copyright\ \gd@annee\ GERAD,
536 \gd@auteurs\copyright}
537 \vspace*{0.05cm}
538
539 \hrule
540 \smallskip
541
542 \noindent
543 \begin{minipage}[t][ ][l]{7.5cm}

```

```

544 \begin{scriptsize}
545 Les textes publi\`es dans la s\`erie des rapports de recherche
546 \textit{Les Cahiers du GERAD} n\`engagent que la responsabilit\`e de
547 leurs auteurs. Les auteurs conservent leur droit d'auteur et leurs
548 droits moraux sur leurs publications et les utilisateurs s'engagent \`a
549 reconna\`tre et respecter les exigences l\`egales associ\`ees
550 \`a ces droits. Ainsi, les utilisateurs:
551 \begin{itemize}
552 \item Peuvent t\`elecharger et imprimer une copie de toute
553 publication du portail public aux fins d'\`etude ou de recherche
554 priv\`ee;
555 \item Ne peuvent pas distribuer le mat\`eriel ou l'utiliser pour une
556 activit\`e \`a but lucratif ou pour un gain commercial;
557 \item Peuvent distribuer gratuitement l'URL identifiant la publication.
558 \end{itemize}
559 Si vous pensez que ce document enfreint le droit d'auteur, contactez-
560 nous en fournissant des d\`etails. Nous supprimerons imm\`ediatement
561 l'acc\`es au travail et enqu\`eterons sur votre demande.\par
562 \end{scriptsize}
563 \end{minipage}
564 \hfill
565 \begin{minipage}[t][l]{7.5cm}
566 \begin{scriptsize}
567 The authors are exclusively responsible for the content of their
568 research papers published in the series \textit{Les Cahiers du GERAD}.
569 Copyright and moral rights for the publications are retained by the
570 authors and the users must commit themselves to recognize and abide the
571 legal requirements associated with these rights. Thus, users:
572 \begin{itemize}
573 \item May download and print one copy of any publication from the public
574 portal for the purpose of private study or research;
575 \item May not further distribute the material or use it for any
576 profit-making activity or commercial gain;
577 \item May freely distribute the URL identifying the publication.
578 \end{itemize}
579 If you believe that this document breaches copyright please contact us
580 providing details, and we will remove access to the work immediately and
581 investigate your claim.\par
582 \end{scriptsize}
583 \end{minipage}
584
585 \thispagestyle{empty}
586 \parindent=15pt
587 \newpage
588 }
589
590 % Plain title page
591 \newcommand{\GD@plain@titlepage@begin}{%
592 \thispagestyle{empty}
593 \sffamily

```

```

594 {\sffamily\LARGE\bfseries\noindent\gd@titre\par}
595 }
596
597 \newcommand{\GD@plain@pagetitle@end}{%
598 \vspace*{12pt}
599 {\noindent\gd@mois\ \gd@annee}
600 \vspace*{30pt}
601 }

```

A.7 Public class commands and environments

The public commands are those that can be directly accessed by the user. They are, however, each linked to a specific part of the paper, and thus cannot be reused or moved.

A.7.1 Metadata

The following commands are those users use to enter their paper's bibliographical data. They modify the values of the corresponding private commands (see [subsubsection A.6.1](#)).

```

602
603 % Metadata public commands
604 \newcommand{\GDannee}[1]{%
605 \renewcommand{\gd@annee}{#1}
606 }
607 \newcommand{\GDmois}[2]{%
608 \renewcommand{\gd@mois}{#1}
609 \renewcommand{\gd@month}{#2}
610 }
611 \newcommand{\GDnumero}[1]{%
612 \renewcommand{\gd@numero}{#1}
613 }
614 \newcommand{\GDtitre}[1]{%
615 \renewcommand{\gd@titre}{#1}
616 }
617 \newcommand{\GDauteursCourts}[1]{%
618 \renewcommand{\gd@auteurs@short}{#1}
619 }
620 \newcommand{\GDauteursCopyright}[1]{%
621 \renewcommand{\gd@auteurs@copyright}{#1}
622 }
623 \newcommand{\GDpostpubcitation}[2]{%
624 \renewcommand{\gd@postpubcitation}{#1}
625 \renewcommand{\gd@postpubcitation@url}{#2}
626 }
627 \newcommand{\GDrevised}[1]{%

```



```

628 \renewcommand{\gd@revised}{#1}
629 }

```

A.7.2 Document subdivisions

Each part of the paper has specific characteristics in terms of geometry and formatting (headers, footers, etc.). Rather than bloating the template with multiple lines of code, a few commands and environments were created to group them together.

```

630
631 % Cover page
632 \newcommand{\GDpageCouverture}{%
633 \ifthenelse{\boolean{GD@isPlainVersion}}{\GD@cover}
634 }
635
636 % Title page
637 \newenvironment{GDpagetitre}{
638 \ifthenelse{\boolean{GD@isPlainVersion}}%
639 {\GD@plain@titlepage@begin}%
640 {\GD@titlepage@begin}
641 }{
642 \ifthenelse{\boolean{GD@isPlainVersion}}%
643 {\GD@plain@pagetitle@end}%
644 {\GD@titlepage@end}
645 }
646
647 % Title page lists and list items
648 \newlist{GDauthlist}{itemize}{1}
649 \setlist[GDauthlist]{label={},%
650 left=0pt .. 0pt,%
651 itemsep=\GD@authitemsep,%
652 topsep=\GD@authtopsep}
653 \newlist{GDaffillist}{enumerate}{1}
654 \setlist[GDaffillist]{label=\textsuperscript{\emph{\alph*}},%
655 ref=\textsuperscript{\emph{\alph*}},%
656 wide,%
657 left=0pt .. 1em,%
658 itemsep=\GD@affilitemsep,%
659 topsep=\GD@affiltopsep}
660 \newlist{GDemaillist}{itemize}{1}
661 \setlist[GDemaillist]{label={},%
662 left=0pt .. 0pt,%
663 itemsep=0pt,%
664 parsep=0pt}
665 \newcommand{\GDrefsep}{\textsuperscript{,\,\,}}
666 \newcommand{\GDauthitem}[1]{%
667 \ifthenelse{\boolean{GD@isPlainVersion}}{%

```

```

668 \item {\sffamily\large\bfseries #1}
669 }{%
670 \item {\Large\bfseries #1}
671 }
672 }
673 \newcommand{\GDaffilitem}[2]{\item \label{#1}{\itshape #2}}
674 \newcommand{\GDemailitem}[1]{\item {\small\ttfamily #1}}
675
676 % Abstracts section
677 \newcommand{\GDabstracts}{%
678 \ifthenelse{\boolean{GD@isPlainVersion}}{\}{%
679 \setcounter{page}{2}
680 \renewcommand{\thepage}{\roman{page}}
681 \pagestyle{fancy}
682 \lhead[
683 \textcolor{gris}{\sffamily{\,}\thepage}\hfill
684 \textcolor{gris}{\sffamily G--\gd@annee--\gd@numero}\hfill %
685 \ifthenelse{\boolean{GD@isRevised}}{\}{%
686 {{ -- \itshape Revised}}}%
687 {}
688 \textcolor{gris}{\sffamily Les Cahiers du GERAD}
689 {\large\strut}\color{gris}{\hrule}
690 ]
691 {
692 \textcolor{gris}{\sffamily{\,}\ Les Cahiers du GERAD}\hfill
693 \textcolor{gris}{\sffamily G--\gd@annee--\gd@numero}\hfill %
694 \ifthenelse{\boolean{GD@isRevised}}{\}{%
695 {{ -- \itshape Revised}}}%
696 {}
697 \textcolor{gris}{\sffamily\thepage}
698 {\large\strut}\color{gris}{\hrule}
699 }
700 \chead[]{}
701 \rhead[]{}
702 \lfoot[]{}
703 \cfoot[]{}
704 \rfoot[]{}
705 \renewcommand{\headrulewidth}{0pt}
706 \renewcommand{\footrulewidth}{0pt}
707 \rmfamily
708 \vspace*{5pt}
709 }
710 }
711
712 % Custom abstract environment
713 \newenvironment{GDabstract}[1]{%
714 \paragraph{#1 : }
715 }{%
716 \ifthenelse{\boolean{GD@isPlainVersion}}{\}{\vspace*{2cm}}
717 }

```

```

718
719 % Acknowledgements section
720 \newenvironment{GDacknowledgements}{%
721 \ifthenelse{\boolean{GD@isPlainVersion}}{%
722 \paragraph{Acknowledgements: }
723 }{%
724 \vfill
725 \hrule
726 \smallskip
727 \paragraph{Acknowledgements: }
728 }
729 }{}
730
731 % Article section
732 \newcommand{\GDarticlestart}{%
733 \ifthenelse{\boolean{GD@isPlainVersion}}{}{%
734 \newpage
735 \setcounter{page}{1}
736 \renewcommand{\thepage}{\arabic{page}}
737 \baselineskip=12.5pt
738 \rmfamily
739 }
740 }
741 \end{class}

```

Change History

1.0

General: Initial release 1