

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

Benoit Hamel* Karine Hébert^{†‡}

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*Library, HEC Montréal

[†]GERAD, HEC Montréal

[‡]English translation by Josée Lafrenière



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

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 `gadminitabs` 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.

2.3 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 *Cahier*’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> <code>\GDauthitem</code> <code>\GDrefsep</code>	The <code>GDauthlist</code> environment is a customized list in which the authors enter their full name using the <code>\GDauthitem</code> command (NB: one author per line). The authors can link their affiliations with the <code>\ref{}</code> command, as demonstrated in Source Code 1 . In the event that an author has more than one affiliation, they must use one <code>\ref{}</code> command per affiliation, separating each one with a <code>\GDrefsep</code> command.
<code>GDaffillist</code> <code>\GDaffilitem</code>	The <code>GDaffillist</code> environment is a customized list of all the authors’ affiliations, in no predefined order of importance. Each affiliation is written with a <code>\GDaffilitem</code> command with the label of the affiliation entered between the first

Source Code 1: Authors list example

```

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

```

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.

```

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}{90pt}}%
113 {\setlength{\GD@titleminipage@upper@vspace}{212pt}}

```

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}{\z0}%
156 {-2ex \@plus -1ex \@minus -.2ex}%
157 {1ex \@plus .2ex}%
158 {\normalfont\Large\sffamily\bfseries}}
159 \renewcommand{\subsection}{\@startsection{subsection}{2}{\z0}%
160 {-1.25ex\@plus -1ex \@minus -.2ex}%
161 {.75ex \@plus .2ex}%
162 {\normalfont\large\sffamily\bfseries}}
163 \renewcommand{\subsubsection}{\@startsection{subsubsection}{3}%
164 {\z0}%
165 {-1.25ex\@plus -1ex \@minus -.2ex}%
166 {.75ex \@plus .2ex}%
167 {\normalfont\normalsize\sffamily\bfseries}}
168 \renewcommand{\paragraph}{\@startsection{paragraph}{4}{\z0}%
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\@endpefalse
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
240 \vspace*{\GD@titleminipage@upper@vspace}
241 \hspace*{\GD@titleminipage@hspace}
242 \begin{minipage}[c][5.4cm][c]{7cm}
243 {\ifthenelse{\boolean{GD@isWebVersion}}{%
244 {\GDcover@minipagetable@web}%
245 {\GDcover@minipagetable@paper}%
246 }
247 \end{minipage}
248
249 \vfill
250
251 \ifthenelse{\boolean{GD@isPostPublication}}{}{%
252 \GDcover@bottom@postpub
253 }{}%
254 \GDcover@bottom@regular
255 }
256 \end{titlepage}
257 }
258
259 % Cover page minipage table (web version)
260 \newcommand{\GDcover@minipagetable@web}{%
```



```

261 \begin{tabular}{p{.5cm}|p{5.5cm}}
262 & \normalsize G--\gd@annee--\gd@numero
263 \ifthenelse{\boolean{GD@needsminitabs}}{%
264 {\*\*[10pt]}%
265 {\*\*[8pt]}
266 & \normalsize\gd@month\ \gd@annee
267 \ifthenelse{\boolean{GD@isRevised}}{%
268 \\\
269 & \normalsize Revised: \gd@revised
270 }{}
271 \end{tabular}
272 }
273
274 % Cover page minipage table (paper version)
275 \newcommand{\GDcover@minipagetable@paper}{%
276 \begin{tabular}{p{.5cm}|p{5.5cm}}
277 \multicolumn{2}{p{6.5cm}}{\normalsize\bfseries \gd@titre
278 \ifthenelse{\boolean{GD@needsminitabs}}{%
279 {\vspace*{12.5pt}}%
280 {\vspace*{10pt}}}\\\
281 & \normalsize\gd@auteurs@short \\\ %Initials. Name
282 & \ifthenelse{\boolean{GD@needsminitabs}}{%
283 {\*\*[15pt]}%
284 {\*\*[12pt]}
285 & \normalsize G--\gd@annee--\gd@numero
286 \ifthenelse{\boolean{GD@needsminitabs}}{%
287 {\*\*[10pt]}%
288 {\*\*[8pt]}
289 & \normalsize\gd@month\ \gd@annee
290 \ifthenelse{\boolean{GD@isRevised}}{%
291 \\\
292 & \normalsize Revised: \gd@revised
293 }{}
294 \end{tabular}
295 }
296
297 % Regular cover page bottom
298 \newcommand{\GDcover@bottom@regular}{%
299 \hrule
300 \smallskip
301
302 \noindent\begin{minipage}[t][l]{7.5cm}
303 \scriptsize
304 La collection \textit{Les Cahiers du GERAD} est constitu\'e des
305 travaux de recherche men\'es par nos membres. La plupart de ces
306 documents de travail a \'et\'e soumis \'a des revues avec
307 comit\'e de r\'evision. Lorsqu'un document est accept\'e et
308 publi\'e, le pdf original est retir\'e si c'est n\'ecessaire et
309 un lien vers l'article publi\'e est ajout\'e.\\\
310

```

311 \medskip
312 \scriptsize
313 \textbf{Citation sugg\`ere :} \gd@auteurs@short~(\gd@mois\
314 \gd@annee). \gd@titre, Rapport technique, Les Cahiers du GERAD G--
315 \gd@annee--\gd@numero, GERAD, HEC Montr\'eal, Canada.\\
316
317 \textbf{Avant de citer ce rapport technique,} veuillez visiter notre
318 site Web (\url{https://www.gerad.ca/fr/papers/G-\gd@annee-\gd@numero})
319 afin de mettre \`a jour vos donn\'ees de r\'ef\'erence, s'il a \`et\'e
320 publi\'e dans une revue scientifique.\par
321 \end{minipage}
322 \hfill
323 \begin{minipage}[t][l]{7.5cm}
324 \scriptsize
325 The series \textit{Les Cahiers du GERAD} consists of working papers
326 carried out by our members. Most of these pre-prints have been submitted
327 to peer-reviewed journals. When accepted and published, if necessary,
328 the original pdf is removed and a link to the published article is
329 added.\\ \\
330
331 \scriptsize
332 \textbf{Suggested citation:} \gd@auteurs@short~(\gd@month\ \gd@annee).
333 \gd@titre, Technical report, Les Cahiers du GERAD G--\gd@annee--
334 \gd@numero, GERAD, HEC Montr\'eal, Canada.\\
335
336 \textbf{Before citing this technical report,} please visit our website
337 (\url{https://www.gerad.ca/en/papers/G-\gd@annee-\gd@numero}) to update
338 your reference data, if it has been published in a scientific journal.
339 \par
340 \end{minipage}
341
342 \bigskip
343 \hrule
344 \smallskip
345
346 \noindent\begin{minipage}[t][l]{7.5cm}
347 \scriptsize
348 La publication de ces rapports de recherche est rendue possible gr\`ace
349 au soutien de HEC Montr\'eal, Polytechnique Montr\'eal, Universit\'e
350 McGill, Universit\'e du Qu\'ebec \`a Montr\'eal, ainsi que du Fonds de
351 recherche du Qu\'ebec -- Nature et technologies.
352
353 \medskip
354 D\'ep\`ot l\'egal -- Biblioth\'eque et Archives nationales du Qu\'ebec,
355 \gd@annee\\
356 -- Biblioth\'eque et Archives Canada, \gd@annee
357 \par
358 \end{minipage}
359 \hfill
360 \begin{minipage}[t][l]{7.5cm}

361 \scriptsize
 362 The publication of these research reports is made possible
 363 thanks to the support of HEC Montr\'eal, Polytechnique Montr\'eal,
 364 McGill University, Universit\'e du Qu\'ebec \'a Montr\'eal, as well as
 365 the Fonds de recherche du Qu\'ebec -- Nature et technologies.
 366
 367 \medskip
 368 Legal deposit -- Biblioth\'eque et Archives nationales du Qu\'ebec,
 369 \gd@annee\
 370 -- Library and Archives Canada, \gd@annee\par
 371 \end{minipage}
 372
 373 \hrule
 374 \smallskip
 375
 376 \noindent
 377 \begin{minipage}[t][1cm][l]{7.5cm}
 378 \begin{scriptsize}\raggedleft
 379 \textbf{GERAD} HEC Montr\'eal
 380
 381 3000, chemin de la C\^ote-Sainte-Catherine
 382
 383 Montr\'eal (Qu\'ebec) Canada H3T 2A7\par
 384 \end{scriptsize}
 385 \end{minipage}
 386 \hspace*{.35cm}\vrule\hfill
 387 \begin{minipage}[t][1cm][l]{7.5cm}
 388 \begin{scriptsize}
 389 \textbf{T\'el.},: 514 340-6053
 390
 391 T\'el\'ec.},: 514 340-5665
 392
 393 info@gerad.ca
 394
 395 www.gerad.ca\par
 396 \end{scriptsize}
 397 \end{minipage}
 398
 399 \bigskip
 400 \hrule
 401 }
 402
 403 % Post-publication cover page bottom
 404 \newcommand{\GDcover@bottom@postpub}{%
 405 \hrule
 406 \smallskip
 407
 408 \noindent
 409 \begin{minipage}[t][l]{7.5cm}
 410 \scriptsize

411 La collection \textit{Les Cahiers du GERAD} est constitu\''e des
 412 travaux de recherche men\''s par nos membres. La plupart de ces
 413 documents de travail a \''t\'' soumis \'{a} des revues avec comit\''e
 414 de r\''vision. Lorsqu'un document est accept\'' et publi\''e, le
 415 pdf original est retir\'' si c'est n\''cessaire et un lien vers
 416 l'article publi\'' est ajout\''.\par
 417 \end{minipage}
 418 \hfill
 419 \begin{minipage}[t][l]{7.5cm}
 420 \scriptsize
 421 The series \textit{Les Cahiers du GERAD} consists of working papers
 422 carried out by our members. Most of these pre-prints have been submitted
 423 to peer-reviewed journals. When accepted and published, if necessary,
 424 the original pdf is removed and a link to the published article is
 425 added.\par
 426 \end{minipage}
 427
 428 \noindent
 429 \begin{minipage}[t][l]{\textwidth}
 430 \footnotesize
 431 \textbf{CITATION ORIGINALE / ORIGINAL CITATION}
 432 \smallskip
 433
 434 \gd@postpubcitation\ \url{\gd@postpubcitation@url}.
 435 \end{minipage}
 436
 437 \bigskip
 438
 439 \hrule
 440 \smallskip
 441
 442 \noindent
 443 \begin{minipage}[t][l]{7.5cm}
 444 \scriptsize
 445 \medskip
 446 La publication de ces rapports de recherche est rendue possible gr\^ace
 447 au soutien de HEC Montr\''eal, Polytechnique Montr\''eal, Universit\''e
 448 McGill, Universit\''e du Qu\''bec \'{a} Montr\''eal, ainsi que du Fonds de
 449 recherche du Qu\''bec -- Nature et technologies.
 450
 451 \medskip
 452 D\''ep\^ot l\''egal -- Biblioth\''eque et Archives nationales du Qu\''bec,
 453 2020\\
 454 -- Biblioth\''eque et Archives Canada, 2020\par
 455 \end{minipage}
 456 \hfill
 457 \begin{minipage}[t][l]{7.5cm}
 458 \scriptsize
 459 \medskip
 460 The publication of these research reports is made possible

```

461 thanks to the support of HEC Montr\'eal, Polytechnique Montr\'eal,
462 McGill University, Universit\'e du Qu\'ebec \'a Montr\'eal, as well as
463 the Fonds de recherche du Qu\'ebec -- Nature et technologies.
464
465 \medskip
466 Legal deposit -- Biblioth\'eque et Archives nationales du Qu\'ebec,
467 2020\\
468 \phantom{Legal deposit} -- Library and Archives Canada, 2020\par
469 \end{minipage}
470
471 \hrule
472 \smallskip
473
474 \noindent
475 \begin{minipage}[t][1cm][l]{7.5cm}
476 \begin{scriptsize}\raggedleft
477 \textbf{GERAD} HEC Montr\'eal
478
479 3000, chemin de la C\^ote-Sainte-Catherine
480
481 Montr\'eal (Qu\'ebec) Canada H3T 2A7\par
482 \end{scriptsize}
483 \end{minipage}
484 \hspace*{.35cm}\vrule\hfill
485 \begin{minipage}[t][1cm][l]{7.5cm}
486 \begin{scriptsize}
487 \textbf{T\'el.},: 514 340-6053}
488
489 T\'el\'ec.},: 514 340-5665
490
491 info@gerad.ca
492
493 www.gerad.ca\par
494 \end{scriptsize}
495 \end{minipage}
496
497 \bigskip
498 \hrule
499 }

```

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`.

```

500
501 % Regular title page
502 \newcommand{\GD@titlepage@begin}{%
503 \ifthenelse{\boolean{GD@isWebVersion}}{%
504 \newpage\clearpage

```

```

505 }{%
506 \ifthenelse{\boolean{GD@isPaperVersion}}{%
507 \newpage\cleardoublepage
508 }{}
509 }
510 \parindent=0pt
511 \sffamily
512 {\LARGE\bfseries \gd@titre\par} %Title
513 \begin{minipage}[t][10cm][l]{7.5cm}
514 \vspace*{55pt}
515 }
516
517 \newcommand{\GD@titlepage@end}{%
518 \vfill
519 \end{minipage}
520 \vfill
521 {\bfseries \gd@month\ \gd@annee}\\*
522 \ifthenelse{\boolean{GD@isRevised}}{%
523 {\ \gd@revised \}%
524 }{}
525 {\bfseries Les Cahiers du GERAD}\\
526 {\bfseries G--\gd@annee--\gd@numero}\\
527 {\footnotesize Copyright \copyright\ \gd@annee\ GERAD,
528 \gd@auteurs@copyright}
529 \vspace*{0.05cm}
530
531 \hrule
532 \smallskip
533
534 \noindent
535 \begin{minipage}[t][ ][l]{7.5cm}
536 \begin{scriptsize}
537 Les textes publi\'es dans la s\'erie des rapports de recherche
538 \textit{Les Cahiers du GERAD} n'engagent que la responsabilit\'e de
539 leurs auteurs. Les auteurs conservent leur droit d'auteur et leurs
540 droits moraux sur leurs publications et les utilisateurs s'engagent \`a
541 reconna\^{\i}tre et respecter les exigences l\`{e}gales associ\`{e}es
542 \`{a} ces droits. Ainsi, les utilisateurs:
543 \begin{itemize}
544 \item Peuvent t\`{e}l\`{e}charger et imprimer une copie de toute
545 publication du portail public aux fins d'\`{e}tude ou de recherche
546 priv\`{e};
547 \item Ne peuvent pas distribuer le mat\`{e}riel ou l'utiliser pour une
548 activit\`{e} \`{a} but lucratif ou pour un gain commercial;
549 \item Peuvent distribuer gratuitement l'URL identifiant la publication.
550 \end{itemize}
551 Si vous pensez que ce document enfreint le droit d'auteur, contactez-
552 nous en fournissant des d\'etails. Nous supprimerons imm\`{e}diatement
553 l'acc\'es au travail et enqu\`{e}terons sur votre demande.\par
554 \end{scriptsize}

```

```

555 \end{minipage}
556 \hfill
557 \begin{minipage}[t][l]{7.5cm}
558 \begin{scriptsize}
559 The authors are exclusively responsible for the content of their
560 research papers published in the series \textit{Les Cahiers du GERAD}.
561 Copyright and moral rights for the publications are retained by the
562 authors and the users must commit themselves to recognize and abide the
563 legal requirements associated with these rights. Thus, users:
564 \begin{itemize}
565 \item May download and print one copy of any publication from the public
566 portal for the purpose of private study or research;
567 \item May not further distribute the material or use it for any
568 profit-making activity or commercial gain;
569 \item May freely distribute the URL identifying the publication.
570 \end{itemize}
571 If you believe that this document breaches copyright please contact us
572 providing details, and we will remove access to the work immediately and
573 investigate your claim.\par
574 \end{scriptsize}
575 \end{minipage}
576
577 \thispagestyle{empty}
578 \parindent=15pt
579 \newpage
580 }
581
582 % Plain title page
583 \newcommand{\GD@plain@titlepage@begin}{%
584 \thispagestyle{empty}
585 \sffamily
586 {\sffamily\LARGE\bfseries\noindent\gd@titre\par}
587 }
588
589 \newcommand{\GD@plain@pagetitle@end}{%
590 \vspace*{12pt}
591 {\noindent\gd@mois\ \gd@annee}
592 \vspace*{30pt}
593 }

```

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](#)).

```
594
595 % Metadata public commands
596 \newcommand{\GDannee}[1]{%
597 \renewcommand{\gd@annee}{#1}
598 }
599 \newcommand{\GDmois}[2]{%
600 \renewcommand{\gd@mois}{#1}
601 \renewcommand{\gd@month}{#2}
602 }
603 \newcommand{\GDnumero}[1]{%
604 \renewcommand{\gd@numero}{#1}
605 }
606 \newcommand{\GDtitre}[1]{%
607 \renewcommand{\gd@titre}{#1}
608 }
609 \newcommand{\GDauteursCourts}[1]{%
610 \renewcommand{\gd@auteurs@short}{#1}
611 }
612 \newcommand{\GDauteursCopyright}[1]{%
613 \renewcommand{\gd@auteurs@copyright}{#1}
614 }
615 \newcommand{\GDpostpubcitation}[2]{%
616 \renewcommand{\gd@postpubcitation}{#1}
617 \renewcommand{\gd@postpubcitation@url}{#2}
618 }
619 \newcommand{\GDrevised}[1]{%
620 \renewcommand{\gd@revised}{#1}
621 }
```

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.

```
622
623 % Cover page
624 \newcommand{\GDpageCouverture}{%
625 \ifthenelse{\boolean{GD@isPlainVersion}}{\}{\GD@cover}
626 }
627
```



```

628 % Title page
629 \newenvironment{GDpagetitre}{
630 \ifthenelse{\boolean{GD@isPlainVersion}}{%
631 {\GD@plain@titlepage@begin}%
632 {\GD@titlepage@begin}
633 }{
634 \ifthenelse{\boolean{GD@isPlainVersion}}{%
635 {\GD@plain@pagetitle@end}%
636 {\GD@titlepage@end}
637 }
638
639 % Title page lists and list items
640 \newlist{GDauthlist}{itemize}{1}
641 \setlist[GDauthlist]{label={},%
642 left=0pt .. Opt,%
643 itemsep=\GD@authitemsep,%
644 topsep=\GD@authtopsep}
645 \newlist{GDaffillist}{enumerate}{1}
646 \setlist[GDaffillist]{label=\textsuperscript{\emph{\alph*}},%
647 ref=\textsuperscript{\emph{\alph*}},%
648 wide,%
649 left=0pt .. 1em,%
650 itemsep=\GD@affilitemsep,%
651 topsep=\GD@affiltopsep}
652 \newlist{GDemaillist}{itemize}{1}
653 \setlist[GDemaillist]{label={},%
654 left=0pt .. Opt,%
655 itemsep=Opt,%
656 parsep=Opt}
657 \newcommand{\GDrefsep}{\textsuperscript{,\,}}
658 \newcommand{\GDauthitem}[1]{%
659 \ifthenelse{\boolean{GD@isPlainVersion}}{%
660 \item {\sffamily\large\bfseries #1}
661 }{%
662 \item {\Large\bfseries #1}
663 }
664 }
665 \newcommand{\GDaffilitem}[2]{\item \label{#1}{\itshape #2}}
666 \newcommand{\GDemailitem}[1]{\item {\small\ttfamily #1}}
667
668 % Abstracts section
669 \newcommand{\GDabstracts}{%
670 \ifthenelse{\boolean{GD@isPlainVersion}}{%
671 \setcounter{page}{2}
672 \renewcommand{\thepage}{\roman{page}}
673 \pagestyle{fancy}
674 \lhead[
675 \textcolor{gris}{\sffamily{\,\,}\thepage}\hfill
676 \textcolor{gris}{\sffamily G--\gd@annee--\gd@numero}\hfill %
677 \ifthenelse{\boolean{GD@isRevised}}{%

```

```

678 {{ -- \itshape Revised}}%
679 {}
680 \textcolor{gris}{\sffamily Les Cahiers du GERAD}
681 {\large\strut}\color{gris}{\hrule}
682 ]
683 {
684 \textcolor{gris}{\sffamily{\,} Les Cahiers du GERAD}\hfill
685 \textcolor{gris}{\sffamily G--\gd@annee--\gd@numero}\hfill %
686 \ifthenelse{\boolean{GD@isRevised}}{%
687 {{ -- \itshape Revised}}%
688 {}
689 \textcolor{gris}{\sffamily\thepage}
690 {\large\strut}\color{gris}{\hrule}
691 }
692 \thead[]{}
693 \rhead[]{}
694 \lfoot[]{}
695 \cfoot[]{}
696 \rfoot[]{}
697 \renewcommand{\headrulewidth}{0pt}
698 \renewcommand{\footrulewidth}{0pt}
699 \rmfamily
700 \vspace*{5pt}
701 }
702 }
703
704 % Custom abstract environment
705 \newenvironment{GDabstract}[1]{%
706 \paragraph{#1 : }
707 }{%
708 \ifthenelse{\boolean{GD@isPlainVersion}}{}{\vspace*{2cm}}
709 }
710
711 % Acknowledgements section
712 \newenvironment{GDacknowledgements}{%
713 \ifthenelse{\boolean{GD@isPlainVersion}}{%
714 \paragraph{Acknowledgements: }
715 }{%
716 \vfill
717 \hrule
718 \smallskip
719 \paragraph{Acknowledgements: }
720 }
721 }{}
722
723 % Article section
724 \newcommand{\GDarticlestart}{%
725 \ifthenelse{\boolean{GD@isPlainVersion}}{}{%
726 \newpage
727 \setcounter{page}{1}

```

```
728 \renewcommand{\thepage}{\arabic{page}}
729 \baselineskip=12.5pt
730 \rmfamily
731 }
732 }
733 \end{class}
```