Changelog for the monograph
The Gradient Discretisation Method,
deposited on the hal server at
`https://hal.archives-ouvertes.fr/hal-01382358`

V6

Typos.

V5

- Removed subtitle.
- Added hyperlinks in the table of contents and on numbers referring to equations, definitions, theorems, etc. In most PDF viewers, clicking on one of these links in dark red sends you to the corresponding chapter/section or equation, definition, theorem, etc.
- Improved index, and added sections 'abbreviations' and 'notations'.

V4

Many changes, following thorough reports from the referees, whom we warmly thanks for their interesting comments. Resulted in more than 80 additional pages. Main changes are:

- Expansion of the literature review, in particular in Chapter 1.
- Re-organisation of Chapters 2 and 3, to present gradient discretisations and gradient schemes first for Dirichlet in Chapter 2, and then extend to other BCs in Chapter 3. Chapter 2 is now more self-contained.
- Extraction of the generic discrete functional analysis for time-dependent problems from Chapter 4 to Appendix C.
- Displacement of $W^{2,p}$ estimates for LLE GDs from the appendix to Section 7.4 in Chapter 7.

- Complete re-writing of Chapter 9 on non-conforming methods. We now start from a generic setting that contains all non-conforming schemes, including high-order methods, before developing more specifically the non-conforming $\mathbb{P}_k$ methods.

- Complete re-writing of Chapter 10 on mixed methods. As for Chapter 9, we now have a generic setting before specific results on $\mathbb{RT}_k$ methods.

- Addition of a new chapter, Chapter 11, on discontinuous Galerkin methods of any order.

- Addition of Appendix A presenting an abstract setting for gradient discretisations. This setting enables us to give unified definitions and proofs for most boundary conditions at once. However, Chapter 2 (on Dirichlet boundary conditions) remains fully self-contained, and Chapter 3 (on the other boundary conditions) can be read without reference to Appendix A if the reader is not interested in the detailed proofs.

- The notion of compactness for Neumann and Fourier boundary conditions has been modified to request the compactness of the trace for the norm topology (which is natural). As a consequence, in Appendix B.3.3 we now prove the compactness of the reconstructed trace $\mathbb{T}_{\mathfrak{T}}$, in order for the control by a polytopal toolbox to imply the compactness of the trace $\mathbb{T}_{\mathcal{D}}$ appearing in gradient discretisations.

- Some numerical results have been gathered in the last chapter of the appendix, in order to illustrate the theoretical properties of the methods.

V3

- Change boxes for definitions.

- Changed subtitle.

- Modified preface and introduction to emphasise on one of the key features of the GDM, which is the convergence analysis for non-linear problems.

- Updated some references.

V2

- Typos.
- Added index.

V1

Initial submission.