

Contents

Preface	3
Part 1: EFFICIENT ITERATIVE PROCESSES	13
1 Two-step methods of high efficiency index	15
2 Numerical methods under slantly-differentiability	53
3 \mathcal{H} -convergence	67
4 Chebyshev-Secant-type methods	83
5 Convergence using recurrent functions	97
6 ω -convergence	125
7 Gauss-Newton method	135
8 Convergence on \mathcal{K} -normed spaces	151
9 Newton's method on spaces with convergence structure	167
Part 2: MATHEMATICAL MODELLING	185
10 Newton's method and interior point techniques	187
11 Finite element methods	193
12 Convergence in Riemannian manifolds	201
13 Convergence on Lie groups	207
14 The shadowing lemma for operators with chaotic behaviour	219
15 Conditionnig of semidefinite programs	225

16 Optimal shape design problems	233
17 Variational inequalities	245
18 Directional Secant-type methods	263
19 Directional Newton-type methods	277
20 Directional two-step methods	289
21 τ-estimation for nonlinear regression models	313
22 Tabuistic regression	325
23 Hyperbolic growth models and applications	337
Bibliography	347
Glossary of Symbols	403
Index	405