

---

## Contents

<b>Preface</b> .....	ix
<b>List of Contributors</b> .....	xi
<b>Alan Turing, Logical and Physical</b> <i>Andrew Hodges</i> .....	3
<hr/>	
<b>Part I The Turing Model of Computation and its Applications to Logic, Mathematics, Philosophy, and Computer Science</b>	
<hr/>	
<b>Computability and Numberings</b> <i>Serikzhan Badaev, Sergey Goncharov</i> .....	19
<b>Computation as Conversation</b> <i>Johan van Benthem</i> .....	35
<b>Computation Paradigms in Light of Hilbert's Tenth Problem</b> <i>Yuri Matiyasevich</i> .....	59
<b>Elementary Algorithms and Their Implementations</b> <i>Yiannis N. Moschovakis, Vasilis Paschalis</i> .....	87
<b>Applications of the Kleene–Kreisel Density Theorem to Theoretical Computer Science</b> <i>Dag Normann</i> .....	119
<b>Church Without Dogma: Axioms for Computability</b> <i>Wilfried Sieg</i> .....	139

<b>Computability on Topological Spaces via Domain Representations</b> <i>Viggo Stoltenberg-Hansen, John V. Tucker</i> . . . . .	153
--	-----

<b>On the Power of Broadcasting in Mobile Computing</b> <i>Jiří Wiedermann, Dana Pardubská</i> . . . . .	195
---	-----

---

## Part II Logic, Algorithms and Complexity

---

<b>The Computational Power of Bounded Arithmetic from the Predicative Viewpoint</b> <i>Samuel R. Buss</i> . . . . .	213
--	-----

<b>Effective Uniform Bounds from Proofs in Abstract Functional Analysis</b> <i>Ulrich Kohlenbach</i> . . . . .	223
---	-----

<b>Effective Fractal Dimension in Algorithmic Information Theory</b> <i>Elvira Mayordomo</i> . . . . .	259
---	-----

<b>Metamathematical Properties of Intuitionistic Set Theories with Choice Principles</b> <i>Michael Rathjen</i> . . . . .	287
--	-----

<b>New Developments in Proofs and Computations</b> <i>Helmut Schwichtenberg</i> . . . . .	313
--	-----

---

## Part III Models of Computation from Nature

---

<b>From Cells to (Silicon) Computers, and Back</b> <i>Gheorghe Păun</i> . . . . .	343
--	-----

<b>Computer Science, Informatics, and Natural Computing—Personal Reflections</b> <i>Grzegorz Rozenberg</i> . . . . .	373
---	-----

---

## Part IV Computable Analysis and Real Computation

---

<b>A Survey on Continuous Time Computations</b> <i>Olivier Bournez, Manuel L. Campagnolo</i> . . . . .	383
---	-----

<b>A Tutorial on Computable Analysis</b> <i>Vasco Brattka, Peter Hertling, Klaus Weihrauch</i> . . . . .	425
---	-----

<b>A Continuous Derivative for Real-Valued Functions</b> <i>Abbas Edalat</i> . . . . .	493
---	-----

**Infinite Time Computable Model Theory**  
*Joel David Hamkins, Russell Miller, Daniel Seabold, Steve Warner . . . . .* 521

**Index . . . . .** 559



New Computational Paradigms  
Changing Conceptions of What is Computable  
Cooper, S.B.; Löwe, B.; Sorbi, A. (Eds.)  
2008, XIV, 560 p., Hardcover  
ISBN: 978-0-387-36033-1