

Contents

1	Implementing Molecular Logic Gates, Circuits, and Cascades Using DNazymes	1
	Matthew R. Lakin, Milan N. Stojanovic and Darko Stefanovic	
2	Enzyme-Based Reversible Logic Gates Operated in Flow Cells. . . .	29
	Evgeny Katz and Brian E. Fratto	
3	Modeling and Modifying Response of Biochemical Processes for Biocomputing and Biosensing Signal Processing	61
	Sergii Domanskyi and Vladimir Privman	
4	Sensing Parameters of a Time Dependent Inflow with an Enzymatic Reaction	85
	Jerzy Gorecki, Joanna N. Gorecka, Bogdan Nowakowski, Hiroshi Ueno, Tatsuaki Tsuruyama and Kenichi Yoshikawa	
5	Combinational Logic Circuit Based on BZ Reaction	105
	Mingzhu Sun and Xin Zhao	
6	Associative Memory in Reaction-Diffusion Chemistry	141
	James Stovold and Simon O’Keefe	
7	Calculating Voronoi Diagrams Using Chemical Reactions	167
	Ben De Lacy Costello and Andrew Adamatzky	
8	Light-Sensitive Belousov–Zhabotinsky Computing Through Simulated Evolution.	199
	Larry Bull, Rita Toth, Chris Stone, Ben De Lacy Costello and Andrew Adamatzky	
9	On Synthesis and Solutions of Nonlinear Differential Equations—A Bio-Inspired Approach.	213
	Ivan Zelinka	

10	Marangoni Flow Driven Maze Solving	237
	Kohta Suzuno, Daishin Ueyama, Michal Branicki, Rita Tóth, Artur Braun and István Lagzi	
11	Chemotaxis and Chemokinesis of Living and Non-living Objects	245
	Jitka Čejková, Silvia Holler, To Quyen Nguyenová, Christian Kerrigan, František Štěpánek and Martin M. Hanczyc	
12	Computing with Classical Soliton Collisions	261
	Mariusz H. Jakubowski, Ken Steiglitz and Richard Squier	
13	Soliton-Guided Quantum Information Processing	297
	Ken Steiglitz	
14	Models of Computing on Actin Filaments	309
	Stefano Siccardi and Andrew Adamatzky	
15	Modeling DNA Nanodevices Using Graph Rewrite Systems	347
	Reem Mokhtar, Sudhanshu Garg, Harish Chandran, Hieu Bui, Tianqi Song and John Reif	
16	Computational Matter: Evolving Computational Functions in Nanoscale Materials	397
	Hajo Broersma, Julian F. Miller and Stefano Nichele	
17	Unconventional Computing Realized with Hybrid Materials Exhibiting the PhotoElectrochemical Photocurrent Switching (PEPS) Effect	429
	Kacper Pilarczyk, Przemysław Kwolek, Agnieszka Podborska, Sylwia Gawęda, Marek Osajca and Konrad Szaciłowski	
18	Organic Memristor Based Elements for Bio-inspired Computing	469
	Silvia Battistoni, Alice Dimonte and Victor Erokhin	
19	Memristors in Unconventional Computing: How a Biomimetic Circuit Element Can be Used to Do Bioinspired Computation	497
	Ella Gale	
20	Nature-Inspired Computation: An Unconventional Approach to Optimization	543
	Xin-She Yang	
21	On Hybrid Classical and Unconventional Computing for Guiding Collective Movement	561
	Jeff Jones	

22	Cellular Automata Ants	591
	Nikolaos P. Bitsakidis, Nikolaos I. Dourvas, Savvas A. Chatzichristofis and Georgios Ch. Sirakoulis	
23	Rough Set Description of Strategy Games on Physarum Machines	615
	Krzysztof Pancierz and Andrew Schumann	
24	Computing a Worm: Reverse-Engineering Planarian Regeneration	637
	Daniel Lobo and Michael Levin	
25	An Integrated <i>In Silico</i> Simulation and Biomatter Compilation Approach to Cellular Computation	655
	Savas Konur, Harold Fellermann, Larentiu Marian Mierla, Daven Sanassy, Christophe Ladroue, Sara Kalvala, Marian Gheorghe and Natalio Krasnogor	
26	Plant Roots as Excellent Pathfinders: Root Navigation Based on Plant Specific Sensory Systems and Sensorimotor Circuits	677
	Ken Yokawa and František Baluška	
27	Soft Plant Robotic Solutions: Biological Inspiration and Technological Challenges	687
	B. Mazzolai, V. Mattoli and L. Beccai	
28	Thirty Seven Things to Do with Live Slime Mould	709
	Andrew Adamatzky	
29	Experiments in Musical Biocomputing: Towards New Kinds of Processors for Audio and Music	739
	Eduardo Reck Miranda and Edward Braund	
30	Immunocomputing and Baltic Indicator of Global Warming	763
	Alexander O. Tarakanov and Alla V. Borisova	
31	Experimental Architecture and Unconventional Computing	773
	Rachel Armstrong	
	Index	805

Advances in Unconventional Computing

Volume 2: Prototypes, Models and Algorithms

Adamatzky, A. (Ed.)

2017, IX, 812 p. 428 illus., 234 illus. in color., Hardcover

ISBN: 978-3-319-33920-7