Contents

Part I  Evolution and Hardware

Evolvable Hardware Challenges: Past, Present and the Path to a Promising Future .......................................... 3
Pauline C. Haddow and Andy M. Tyrrell

Bridging the Gap Between Evolvable Hardware and Industry Using Cartesian Genetic Programming ..................... 39
Zdenek Vasicek

Designing Digital Systems Using Cartesian Genetic Programming and VHDL .................................................. 57
Benjamin Henson, James Alfred Walker, Martin A. Trefzer and Andy M. Tyrrell

Evolution in Nanomaterio: The NASCENCE Project ............... 87
Hajo Broersma

Using Reed-Muller Expansions in the Synthesis and Optimization of Boolean Quantum Circuits ......................... 113
Ahmed Younes

Part II  Cartesian Genetic Programming Applications

Some Remarks on Code Evolution with Genetic Programming ........ 145
Wolfgang Banzhaf

Cartesian Genetic Programming for Control Engineering .......... 157
Tim Clarke

Combining Local and Global Search: A Multi-objective Evolutionary Algorithm for Cartesian Genetic Programming .......... 175
Paul Kaufmann and Marco Platzner
Approximate Computing: An Old Job for Cartesian Genetic Programming? ............................................ 195
Lukas Sekanina

Breaking the Stereotypical Dogma of Artificial Neural Networks with Cartesian Genetic Programming ............................................. 213
Gul Muhammad Khan and Arbab Masood Ahmad

Multi-step Ahead Forecasting Using Cartesian Genetic Programming ............................................. 235
Ivars Dzalbs and Tatiana Kalganova

Medical Applications of Cartesian Genetic Programming ............... 247
Stephen L. Smith and Michael A. Lones

Part III Chemistry and Development

Chemical Computing Through Simulated Evolution ................. 269
Larry Bull, Rita Toth, Chris Stone, Ben De Lacy Costello and Andrew Adamatzky

Sub-Symbolic Artificial Chemistries ............................................. 287
Penelope Faulkner, Mihail Krastev, Angelika Sebald and Susan Stepney

Discovering Boolean Gates in Slime Mould .................. 323
Simon Harding, Jan Koutník, Jürgen Schmidhuber and Andrew Adamatzky

Artificial Development ...................................... 339
Tüze Kuyucu, Martin A. Trefzer and Andy M. Tyrrell

Computers from Plants We Never Made: Speculations .......... 357
Andrew Adamatzky, Simon Harding, Victor Erokhin, Richard Mayne, Nina Gizzie, Frantisek Baluška, Stefano Mancuso and Georgios Ch. Sirakoulis
Inspired by Nature
Essays Presented to Julian F. Miller on the Occasion of his 60th Birthday
Stepney, S.; Adamatzky, A. (Eds.)
2018, X, 387 p. 168 illus., 78 illus. in color., Hardcover
ISBN: 978-3-319-67996-9