

# Preface

We could say perhaps that natural computing is an already mature area: several journals and a large handbook on the subject have been published. We believe, however, that this area is not limited to ordinary research areas but has the potential to expand and create novel fields by including the humanities, arts, design, and so on. Also, novel mathematics is needed to create “bridges” between application and theory.

This book focuses attention not only on recent, ordinary topics but also on future directions of natural computing. The aim of the book both for engineers to understand the basic background of natural computing and for those majoring in mathematics to see how such mathematical solutions are evaluated in actual applications.

This volume is composed of three related topics: (1) Theoretical aspects of natural computing, where Fumiya Okubo and Takashi Yokomori give a survey of recent developments in reaction automata, Hidehiko Okada discusses comparison of two-interval models for fuzzy-valued genetic algorithms, and Biswanath Sethi and Sukanta Das investigate the convergence of asynchronous cellular automata (under null boundary conditions) and their application in pattern classification; (2) Basics of natural computing, where Marcin J. Schroeder considers the relationship between natural computing and computational aesthetics in “Towards Cyber-Phenomenology: Aesthetics and Natural Computing in Multi-level Information Systems” and Takaaki Hashimoto and Kaori Karasawa explore other aspects of science including natural computing from the standpoint of social psychology in “Science, so Close and Yet so Far Away: How People View Science, Science Subjects, and Scientists”; and (3) Computational aesthetics, where aestheticians, computer scientists, and artists argue various aspects of computational aesthetics: Fuminori Akiba and Yasuhiro Suzuki discuss scientific visualisation based on considerations of Klee in “Toward Another Possible Visualisation of Massaging: The First Short Step from Klee to Scientific Visualisation”, Miki Goan, Katsuyoshi Tsujita, Susumu Kihara, and Kenjiro Okazaki show the results of experiments in drawing pictures in “The Generation of Emotional Transmission via a Medium-Perceiving Drawing System and the

Plasticity of Subjects”, from artists on the “synthetic aesthetic” side, Juan M. Castro, Taro Toyota, and Hideo Iwasaki in “Fat as Soft Architecture: The Spontaneous Transformation of Lipids into Organic Geometries with Predefined Biophysical Properties” and Tomoya Ishibashi and Hideo Iwasaki introduce their project in “Breeding-Back of Goldfish as a Practice That Mediates Between Experimental Biology and Aesthetics”.

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