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Introduction to Morphogenetic Computing

Springer

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Preface

This book presents an introduction to morphogenetic computing. The idea of morphogenetic computing came from conflicts and uncertainty situations that grow up when we compare two incompatible universes as local universe and global universe, neural universe and Boolean function universe, database sink and source incompatibility fuzzy logic in the many values. For example, in recursion process we cannot find convergence, in neural network we are in local minimum, and in genetics we have a lot of instability and do not understand fully. So we must create a fundamental new approach to computation by which we can move from uncertainty, inconsistency and imprecision to a more logical stable and consistent situation. Fuzzy set, active sets and other many valued logic can be used to make reasoning in conflicts and uncertain situations but cannot reach the fundamental aim to have consistency and coherence. In morphogenetic computing, we have uncertainty which is only one step of the knowledge and the other is to establish coherent situation. Morphogenetic computing uses recursion with invariance just as in physics where experiments generate conflicts, but after we discover new models for nature where the experiments are not inconsistent but logically consistent. In this book in different situations, we show how to enter conflicts and try to escape from the conflicts and uncertain situations. We argue that global and local relation, defects in crystal non Euclidean geometry database with source and sink, genetic algorithm, neural network all become more stable and efficient when we use morphogenetic computing, where the morphogenetic means globality or morphology, field theory and other topics.

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