
Preface

Chaos is a fascinating phenomenon that has been observed in nature, laboratory, and has been applied in various real-world applications. Chaotic systems are deterministic with no random elements involved yet their behavior appears to be random. Observations of chaotic behavior in nature include weather and climate, the dynamics of satellites in the solar system, the time evolution of the magnetic field of celestial bodies, population growth in ecology, to mention only a few examples. Chaos has been observed in the laboratory in a number of systems such as electrical circuits, lasers, chemical reactions, fluid dynamics, mechanical systems, and magneto-mechanical devices. Chaotic behavior has also found numerous applications in electrical and communication engineering, information and communication technologies, biology and medicine.

To the best of our knowledge, this is the first book edited on chaos applications in intelligent computing. To access the latest research related to chaos applications in intelligent computing, we launched the book project where researchers from all over the world provide the necessary coverage of the mentioned field. The primary objective of this project was to assemble as much research coverage as possible related to the field by defining the latest innovative technologies and providing the most comprehensive list of research references.

The book includes sixteen chapters highlighting current concepts, issues and emerging technologies. Distinguished scholars from many prominent research institutions around the world contribute to the book. The book covers various aspects, including not only some fundamental knowledge and key techniques, but also typical applications and open issues. For example, the fundamental topics include fundamentals of chaos and fundamentals of fractals. The fractal's applications include fractal based image indexing or retrieval, and fractal based biometric indexing. The chaos applications include chaos based communication, chaos based swarm intelligence, chaos based parallel processing, chaos based random bit generation, chaos based cryptography, chaos based digital watermarking, and so on.

The diverse and comprehensive coverage of multiple disciplines in the field of chaos based intelligent computing will contribute to a better understanding of all topics, research, and discoveries in this emerging and evolving field. Furthermore, the contributions included in this book will be instrumental in the expansion of the body of knowledge in this field. The coverage of this book provides strength to this reference resource

for both researchers and also decision makers in obtaining a greater understanding of the concepts, issues, problems, trends, challenges and opportunities related to this field of study. It is our sincere hope that this publication and its great amount of information and research will assist our research colleagues, all faculties, their students, and our organizational decision makers in enhancing their understanding of this research field. Perhaps this publication will even inspire its readers to contribute to the current discoveries in this immense field.

Dr. Ljupco Kocarev

University of California, USA

Dr. Zbigniew Galias

AGH University of Science and Technology, Poland

Dr. Shiguo Lian

France Telecom R&D (Orange Labs) Beijing, China



<http://www.springer.com/978-3-540-95971-7>

Intelligent Computing Based on Chaos

Kocarev, L.; Galias, Z.; Lian, S. (Eds.)

2009, X, 380 p., Hardcover

ISBN: 978-3-540-95971-7