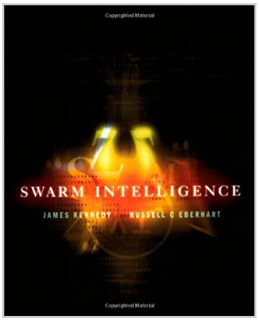

Swarm Intelligence (The Morgan Kaufmann Series in Evolutionary Computation)

By Russell C. Eberhart, Yuhui Shi, James Kennedy

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Traditional methods for creating intelligent computational systems have privileged private "internal" cognitive and computational processes. In contrast, *Swarm Intelligence* argues that human intelligence derives from the interactions of individuals in a social world and further, that this model of intelligence can be effectively applied to artificially intelligent systems. The authors first present the foundations of this new approach through an extensive review of the critical literature in social psychology, cognitive science, and evolutionary computation. They then show in detail how these theories and models apply to a new computational intelligence methodology?particle swarms?which focuses on adaptation as the key behavior of intelligent systems. Drilling down still further, the authors describe the practical benefits of applying particle swarm optimization to a range of engineering problems. Developed by the authors, this algorithm is an extension of cellular automata and provides a powerful optimization, learning, and problem solving method.

This important book presents valuable new insights by exploring the boundaries shared by cognitive science, social psychology, artificial life, artificial intelligence, and evolutionary computation and by applying these insights to the solving of difficult engineering problems. Researchers and graduate students in any of these disciplines will find the material intriguing, provocative, and revealing as will the curious and savvy computing professional.

* Places particle swarms within the larger context of intelligent adaptive behavior and evolutionary computation.
* Describes recent results of experiments with the particle swarm optimization (PSO) algorithm
* Includes a basic overview of statistics to ensure readers can properly analyze the results of their own experiments using the algorithm.
* Support software which can be downloaded from the publishers

website, includes a Java PSO applet, C and Visual Basic source code.

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Editorial Review

Review
Well received the September UK Game industry show. Recent publicity includes a mention in Visual Basic Design Magazine, June issue.

From the Back Cover

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About the Author
Russ Eberhart is Associate Dean of Research at Purdue School of Engineering and Technology in Indianapolis, IN. He is the author of *Neural Network PC Tools* (Academic Press), a leading book in the field of Neural Networks. Among his credits, he is the former President of the IEEE Neural Networks Council.

Yuhui Shi received the Ph.D. degree in electrical engineering from Southeast University, China, in 1992. Since then, he has worked at several universities including the Department of Radio Engineering, Southeast University, Nanjing, China, the Department of Electrical & Computer Engineering, Concordia University, Montreal, Canada, the Department of Computer Science, Australian Defense Force Academic, Canberra, Australia, the Department of Computer Science, Korean Advanced Institute of Science and Technology, Taejon, Korea, and the Department of Electrical Engineering, Purdue School of Engineering and Technology, Indianapolis, Indiana, USA. He is currently with Electronic Data Systems, Inc., Kokomo, Indiana, USA, as an Applied Specialist. His main interests include artificial neural networks, evolutionary computation, fuzzy logic systems and their industrial applications.

Dr. Shi was a co-presenter of the tutorial, *Introduction to Computation Intelligence*, at the 1998 WCCI Conference, Anchorage, Alaska, and presented the tutorial, Evolutionary Computation and Fuzzy Systems, at the 1998 ANNIE Conference, St. Louis. He is the technical co-chair of 2001 Particle Swarm Optimization Workshop, Indianapolis, Indiana.

James Kennedy is a social psychologist who works in survey methods at the US Department of Labor. He has conducted basic and applied research into social effects on cognition and attitude. Dr. Kennedy has worked with the particle swarm computer model of social influence in artificial communities since 1994, presenting research in both the computer-science and social-science publications.

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