Handbook of Genetic Programming Applications

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Editors

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Springer

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To my love, Elnaz, meaning of my life ...
Amir H. Gandomi

To my wife, Fariba, echo of my heart ...
Amir H. Alavi

To Beautiful Heather, my own global optimum ...
Conor Ryan

Foreword

In the past two decades, artificial intelligence algorithms have proved to be promising tools for solving a multitude of tough scientific problems. Their success is due, in part, to the elegant manner in which they avoid the sort of handicaps that often plague mathematical programming-based tools, such as smooth and continuous objective functions. Thus, globally optimal (or close approximations of) design can be achievable with a finite and reasonable number of search iterations.

One of the most exciting of these methods is Genetic Programming (GP), inspired by natural evolution and the Darwinian concept of "Survival of the Fittest". GP's ability to evolve computer programs has seen it enjoy a veritable explosion of use in the last 10 years in almost every area of science and engineering.

This handbook brings together some of the most exciting new developments in key applications of GP and its variants, presented in a hands-on manner to facilitate researchers tackle similar applications and even use the same data for their own experiments.

The handbook is divided into four parts, starting with review chapters to quickly get readers up to speed, before diving into specialized applications in Part II. Part III focuses on hybridized systems, which marry GP to other technologies, and Part IV wraps up the book with a detailed look at some recent GP software releases.

The handbook serves as an excellent reference providing all the details required for a successful application of GP and its branches to challenging real-world problems. Therefore, for most chapters, the used data are either available as supplementary materials or publicly accessible.

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