

Preface

This book covers the recent applications of computational intelligence techniques for modelling, control and automation. The application of these techniques has been found useful in problems when the process is either difficult to model or difficult to solve by conventional methods. There are numerous practical applications of computational intelligence techniques in modelling, control, automation, prediction, image processing and data mining.

Research and development work in the area of computational intelligence is growing rapidly due to the many successful applications of these new techniques in very diverse problems. “Computational Intelligence” covers many fields such as neural networks, (adaptive) fuzzy logic, evolutionary computing, and their hybrids and derivatives. Many industries have benefited from adopting this technology. The increased number of patents and diverse range of products developed using computational intelligence methods is evidence of this fact.

These techniques have attracted increasing attention in recent years for solving many complex problems. They are inspired by nature, biology, statistical techniques, physics and neuroscience. They have been successfully applied in solving many complex problems where traditional problem-solving methods have failed. These modern techniques are taking firm steps as robust problem-solving mechanisms.

This volume aims to be a repository for the current and cutting-edge applications of computational intelligent techniques in modelling control and automation, an area with great demand in the market nowadays.

With roots in modelling, automation, identification and control, computational intelligence techniques provide an interdisciplinary area that is concerned with learning and adaptation of solutions for complex problems. This instantiated an enormous amount of research, searching for learning methods that are capable of controlling novel and non-trivial systems in different industries.

This book consists of open-solicited and invited papers written by leading researchers in the field of computational intelligence. All full papers have been peer review by at least two recognised reviewers. Our goal is to provide a book

that covers the foundation as well as the practical side of the computational intelligence.

The book consists of 17 chapters in the fields of self-learning and adaptive control, robotics and manufacturing, machine learning, evolutionary optimisation, information retrieval, fuzzy logic, Bayesian systems, neural networks and hybrid evolutionary computing.

This book will be highly useful to postgraduate students, researchers, doctoral students, instructors, and partitioners of computational intelligence techniques, industrial engineers, computer scientists and mathematicians with interest in modelling and control.

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