

# Preface

Building intelligent machines has been mankind's dream for decades. There have been many discussions on, and much written about, the impact of machine intelligence on society. Science fiction movies have portrayed both the brighter and the darker aspects of being surrounded on all sides by artificial systems with more intelligence than humans. Building such intelligent machines is, and will remain for the foreseeable future, a dream. The collection of papers that makes up this book, explore the prospects of incorporating intelligent behaviour into software systems. It outlines many promising directions, and describes possible tools and applications for intelligent systems in the near future.

Much effort, time, and money have been spent in the last 50 years in understanding the nature of human intelligence. Why? So that artificial systems can be built that act and work as intelligently as humans. While the realisation of an intelligent machine that is as clever as a human is as yet a technical impossibility, and in some people's view undesirable, we cannot ignore the fact that people nowadays are demanding (intelligent) systems that are useful and can complement their physical or cognitive capabilities. This demand is leading to the creation of a large and lucrative market in intelligent systems, which is naturally spawning the associated information technology industries for building these systems.

The *raison d'être* for this volume is to bring together, within a single publication, a collection of papers describing recent advances in intelligent systems and soft computing, with particular focus on applications. The book is unique in the way it concentrates on building intelligent software systems by combining methods from diverse disciplines, such as fuzzy set theory, neuroscience, agent technology, knowledge discovery, and symbolic artificial intelligence (AI). Traditionally, AI has been trying to solve human-centred problems, such as natural language understanding, speech recognition, and common-sense reasoning. On the other hand, soft computing has been applied successfully in the areas of pattern recognition, function approximation, clustering, and automatic control. The papers in this book explore the possibility and opportunity of bringing these two areas closer together. The first section focuses on future directions and includes contributions from some of the most eminent academics in the fields. The second section aims to provide the reader with an overview of recently developed software tools to aid researchers and practitioners in building flexible intelligent systems. The final section describes a number of developed applications that utilise the theoretical results and software tools described in the first two sections. We hope that the particular combination of the three sections will ensure that the book appeals to a wide audience, ranging from industrial researchers to academic scholars.

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