Foundations Of Computational Intelligence Volume 5 Function Approximation And

Classification Studies In Computational Intelligence

This book is showcases recent

advances in knowledge discovery enhanced with semantic and social information. It includes eight chapters that grew out of joint workshops at ECML/PKDD 2007. The contributions

emphasize the vision of the Web as a social medium. Global optimization is a branch of applied mathematics and numerical analysis that deals with the task of finding the absolutely best set of

admissible conditions to satisfy certain criteria / objective function(s), formulated in mathematical terms. Global optimization includes nonlinear, stochastic and combinatorial

programming, multiobjective programming, control, games, geometry, approximation, algorithms for parallel architectures and so on. Due to its wide usage and applications, it has gained the

attention of researchers and practitioners from a plethora of scientific domains. Typical practical examples of global optimization applications include: Traveling salesman problem and electrical circuit

design (minimize the path length); safety engineering (building and mechanical structures); mathematical problems (Kepler conjecture); Protein structure prediction (minimize the energy function)

etc. Global Optimization algorithms may be categorized into several types: Deterministic (example: branch and bound methods), Stochastic optimization (example: simulated

annealing). Heuristics and meta-heuristics (example: evolutionary algorithms) etc. Recently there has been a growing interest in combining global and local search strategies to solve more

complicated optimization problems. This edited volume comprises 17 chapters, including several overview Chapters, which provides an up-to-date and state-of-the art research covering the theory

and algorithms of global optimization. Besides research articles and expository papers on theory and algorithms of global optimization, papers on numerical experiments and on real world applications were

also encouraged. The book is divided into 2 main parts. Though the reductionist approachto biology and medicine has led to several imp- tant advances, further progresses with respect to the

remaining challenges require integration of representation, characterization and modeling of the studied systems along a wide range of spatial and time scales. Such an approach, intrinsically - lated to systems

biology, is poised to ultimately turning biology into a more precise and synthetic discipline, paving the way to extensive preventive and regenerative medicine [1], drug discovery [20] and

treatment optimization [24]. A particularly appealing and effective approach to addressing the complexity of interactions inherent to the biological systems is provided by the new area of c- plex

networks [34, 30, 8, 13, 12]. Basically, it is an extension of graph theory [10], focusing on the modeling, representation, characterization, analysis and simulation ofcomplexsystemsb yconsideringmanyelementsand

theirinterconnections.C- plex networks concepts and methods have been used to study disease [17], tr- scription networks [5, 6, 4], protein-protein networks [22, 36, 16, 39], metabolic

networks [23] and anatomy [40].

The Group Method of Data Handling (GMDH) is a typical inductive modeling method that is built on principles of self-organization for modeling

complex systems. This book clearly presents hybrids of some computational intelligence techniques and GMDH approach.

Foundations of Computational Intelligence

Results of the 1st International Workshop on Complex Networks (CompleNet 2009) A Sourcebook

11th International Work-Conference on Artificial Neural Networks, IWANN 2011,

Torremolinos-Málaga, Spain, June 8-10, 2011, Proceedings Volume 6: Data Mining Advances and Applications

Artificial Intelligence presents a practical guide to AI, including

agents, machine learning and problem-solving simple and complex domains.

Foundations of Computational Intelligence Volume 2:

Approximation Reasoning: Theoretical Foundations and Applications Human reasoning usually is very approximate and involves various types of - certainties.

Approximate reasoning is the computational modelling of any part of the process used by humans to reason about natural phenomena or to solve real world

problems. The scope of this book includes fuzzy sets, Dempster-Shafer theory, multi-valued logic, probability, random sets, and rough set, near set and hybrid

intelligent systems. Besides research articles and expository papers on t- ory and algorithms of approximation reasoning, papers on numerical

experiments and real world applications were also encouraged. This Volume comprises of 12 chapters including an overview chapter providing an up-to-date

and state-of-the research on the applications of Computational Intelligence techniques for - proximation reasoning. The Volume is

divided into 2 parts: Part-I: Approximate Reasoning - Theoretical Foundations Part-II: Approximate Reasoning - Success Stories and Real World Applications Part

I on Approximate Reasoning - Theoretical Foundations contains four ch- ters that describe several approaches of fuzzy and Para consistent

annotated logic approximation reasoning. In Chapter 1, “Fuzzy Sets, Near Sets, and Rough Sets for Your Computational Intelligence Toolbox” by

Peters considers how a user might utilize fuzzy sets, near sets, and rough sets, taken separately or taken together in hybridizations as part

of a computational intelligence toolbox. In multi-criteria decision making, it is necessary to aggregate (combine) utility values corresponding to several

criteria (parameters). This book explores the increasing convergence of Social Media and Semantic Web technologies. It offers up-to-date contributions

that illustrate various approaches to this young and emerging technology area.

Computational intelligence is a component of

Encyclopedia of Technology, Information, and Systems Management Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated

compendium of twenty one Encyclopedias. Computational intelligence is a rapidly growing research field including a wide variety of problem-

solving techniques inspired by nature. Traditionally computational intelligence consists of three major research areas: Neural Networks,

Fuzzy Systems, and Evolutionary Computation. Neural networks are mathematical models inspired by brains. Neural networks have

massively parallel network structures with many neurons and weighted connections. Whereas each neuron has a simple input-output relation, a neural

network with many neurons can realize a highly non-linear complicated mapping. Connection weights between neurons can be adjusted in an automated

manner by a learning algorithm to realize a non-linear mapping required in a particular application task. Fuzzy systems are mathematical models proposed to

handle inherent fuzziness in natural language. For example, it is very difficult to mathematically define the meaning of “cold” in everyday conversations

such as “It is cold today” and “Can I have cold water”. The meaning of “cold” may be different in a different situation. Even in the same situation, a

different person may have a different meaning. Fuzzy systems offer a mathematical mechanism to handle inherent fuzziness in natural language. As a

result, fuzzy systems have been successfully applied to real-world problems by extracting linguistic knowledge from human experts in the form of fuzzy IF-

THEN rules. Evolutionary computation includes various population-based search algorithms inspired by evolution in nature. Those algorithms usually have the

following three mechanisms: fitness evaluation to measure the quality of each solution, selection to choose good solutions from the current

population, and variation operators to generate offspring from parents. Evolutionary computation has high applicability to a wide range of optimization

problems with different characteristics since it does not need any explicit mathematical formulations of objective functions. For example, simulation-

based fitness evaluation is often used in evolutionary design. Subjective fitness evaluation by a human user is also often used in evolutionary art and

music. These volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research

personnel and Policy analysts, managers, and decision makers. Applications in Business, Engineering, and Medicine

The Foundations of

Artificial Intelligence

Approximate Reasoning

Advances in Data Management

Handbook Of Machine Learning - Volume 1: Foundation Of Artificial

Intelligence

Computational Intelligence - Volume II

This is a comprehensive book on the theories of artificial intelligence with an emphasis on their applications. It combines fuzzy logic and neural

networks, as well as hidden Markov models and genetic algorithm, describes advancements and applications of these machine learning techniques and describes the problem of causality. This book should serves as a useful reference

for practitioners in artificial intelligence.

The book is a collection of invited papers on Computational Intelligence for Privacy and Security. The majority of the chapters are extended versions of

works presented at the special session on Computational Intelligence for Privacy and Security of the International Joint Conference on Neural Networks (IJCNN-2010) held July 2010 in Barcelona, Spain. The book is devoted to

Computational Intelligence for Privacy and Security. It provides an overview of the most recent advances on the Computational Intelligence techniques being developed for Privacy and Security. The book will be of interest to

researchers in industry and academics and to post-graduate students interested in the latest advances and developments in the field of Computational Intelligence for Privacy and Security.

"This book explores the complex

world of computational intelligence, which utilizes computational methodologies such as fuzzy logic systems, neural networks, and evolutionary computation for the purpose of managing and using data effectively to address complicated

real-world problems"--

Recent years have seen numerous applications across a variety of fields using various techniques of Computational Intelligence. This book, one of a series on the foundations of Computational

Intelligence, is focused on learning and approximation.

Parallel Algorithms, Systems and Applications

Integrating Knowledge Management, New Media Technologies and Semantic Systems

Volume 4: Bio-Inspired Data Mining

Artificial Intelligence

Computer and Information Science 2009

Challenges and Opportunities of Connected k-Covered Wireless Sensor Networks

Foundations of Computational Intelligence Volume 6: Data Mining: Theoretical Foundations and Applications Finding information hidden in data is as theoretically difficult as it is practically important. With the objective of discovering unknown

patterns from data, the methodologies of data mining were derived from statistics, machine learning, and artificial intelligence, and are being used successfully in application areas such as bioinformatics, business, health care, banking, retail, and

many others. Advanced representation schemes and computational intelligence techniques such as rough sets, neural networks; decision trees; fuzzy logic; evolutionary algorithms; arti- cial immune systems; swarm intelligence;

reinforcement learning, association rule mining, Web intelligence paradigms etc. have proved valuable when they are - plied to Data Mining problems. Computational tools or solutions based on intel- gent systems are being used with great success in

Data Mining applications. It is also observed that strong scientific advances have been made when issues from different research areas are integrated. This Volume comprises of 15 chapters including an overview chapter providing an up-to-date

and state-of-the research on the applications of Computational Int- ligence techniques for Data Mining. The book is divided into 3 parts: Part-I: Data Click Streams and Temporal Data Mining Part-II: Text and Rule Mining Part-III: Applications Part

I on Data Click Streams and Temporal Data Mining contains four chapters that describe several approaches in Data Click Streams and Temporal Data Mining.

The publication of this book on evolutionaryImage Analysis and

Signal P- cessing (IASP) has two main goals. The ?rst, occasional one is to celebrate the 10th edition of EvoIASP, the workshop which has been the only event speci?cally dedicated to this topic since 1999. The second, more important one is to give an

overview of the opportunities o?ered by Evolutionary C- putation (EC) techniques to computer vision,pattern recognition,and image and signal processing. It is not possible to celebrate EvoIASP properly without ?rst ackno- edging

EvoNET, the EU-funded network of excellence, which has made it possible for Europe to build a strong European research community on EC. Thanks to the success of the ?rst, pioneering event organized by EvoNET, held in 1998 in Paris, it was possible

to realize that not only was EC a f- tile ground for basic research but also there were several application ?elds to which EC techniques could o?er a valuable contribution. That was how the id eaofcreatingasingleevent,EvoWor kshops,outofacollectionofworksh

ops dedicated to applications of EC, was born. Amongst the possible application ?elds for EC, IASP was selected almost accidentally, due to the occasional presence, within EvoNET, of less than a handful of researchers who were interested

in it. I would lie if I stated that the event was a great success since its very start, but it was successful enough to survive healthily for a couple of years, before reaching its present size, relevance, and popularity. Research in computational

intelligence is directed toward building thinking machines and improving our understanding of intelligence. As evident, the ultimate achievement in this field would be to mimic or exceed human cognitive capabilities including reasoning, recognition,

creativity, emotions, understanding, learning and so on. In this book, the authors illustrate an hybrid computational intelligence framework and it applications for various problem solving tasks. Based on tree-structure based

encoding and the specific function operators, the models can be flexibly constructed and evolved by using simple computational intelligence techniques. The main idea behind this model is the flexible neural tree, which is very adaptive,

accurate and efficient. Based on the pre-defined instruction/operator sets, a flexible neural tree model can be created and evolved. This volume comprises of 6 chapters including an introductory chapter giving the fundamental definitions and

the last Chapter provides some important research challenges. Academics, scientists as well as engineers engaged in research, development and application of computational intelligence techniques and data mining will find the comprehensive coverage

of this book invaluable. Provides an in-depth and even treatment of the three pillars of computational intelligence and how they relate to one another This book covers the three fundamental topics that form the basis of computational

intelligence: neural networks, fuzzy systems, and evolutionary computation. The text focuses on inspiration, design, theory, and practical aspects of implementing procedures to solve real-world problems. While other books in the three fields that comprise

computational intelligence are written by specialists in one discipline, this book is co-written by current former Editor-in-Chief of IEEE Transactions on Neural Networks and Learning Systems, a former Editor-in-Chief of IEEE Transactions on Fuzzy Systems,

and the founding Editor-in-Chief of IEEE Transactions on Evolutionary Computation. The coverage across the three topics is both uniform and consistent in style and notation. Discusses single-layer and multilayer neural networks, radial-basis function

networks, and recurrent neural networks Covers fuzzy set theory, fuzzy relations, fuzzy logic interference, fuzzy clustering and classification, fuzzy measures and fuzzy integrals Examines evolutionary optimization, evolutionary learning and

problem solving, and collective intelligence Includes end-of-chapter practice problems that will help readers apply methods and techniques to real-world problems Fundamentals of Computational intelligence is written for advanced

undergraduates, graduate students, and practitioners in electrical and computer engineering, computer science, and other engineering disciplines.

Evolutionary Image Analysis and Signal Processing

Knowledge Discovery Enhanced with Semantic and Social Information

Intelligent Systems and Technologies

Transfer in Reinforcement Learning Domains

Methods and Applications

Volume 1: Learning and Approximation

The theme of the 2nd International KES Symposium on Intelligent Interactive Multimedia Systems and Services was integration of multimedia

processing techniques in a new wave of user-centric services and processes. This text offers the symposium's proceedings. This book covers the latest theories, applications and techniques in Biologically-

Inspired Optimisation Methods. Many chapters derive from studies presented at workshops and international conferences on e-Science, Grid Computing and Evolutionary computation.

The overwhelming pace of

evolution in technology has made it possible to develop intelligent systems which help users in their dayly life activities. - cordingly, methods of recording, managing and analysing data have evolved

from the very simple ?le systems into complex ambient supportive intelligent systems. This book arises as a compilation of methods, techniques and tools c-nected with data related issues: from modelling to analysis. A

broad range of approaches such as database self- techniques for ubiquitous environments, multimedia data, or data driven models will be reviewed. Di?erent areas of applications, in which data models conceptualize*

nowadays reality, starting from e-learning to electric transformers will be considered. The book is a collection of representative contributions to cover the sp-trum related to data bases, which support decision making and

data mining methods as well as conceptualization. Datawarehouse technology and m- eling are presented in the ?rst chapter together with the deep review of datawarehouse techniques for supporting e-

learning processes with special emphasis on data cubes, all the tools are considered in the context of imp- mentationofsoftw areapplication.Thesecondchapte rcontinueswiththes- ilar technology and deals with the

community data warehouse architecture.

Foundations of Computational Intelligence Volume 4: Bio-Inspired Data Mining Theoretical Foundations and Applications

Recent advances in the

computing and electronics technology, particularly in sensor devices, databases and distributed systems, are leading to an exponential growth in the amount of data stored in databases. It has been estimated

that this amount doubles every 20 years. For some applications, this increase is even steeper. Databases storing DNA sequence, for example, are doubling their size every 10 months. This growth is occurring

in several applications areas besides bioinformatics, like financial transactions, government data, environmental mo- toring, satellite and medical images, security data and web. As large organizations recognize

the high value of data stored in their databases and the importance of their data collection to support decision-making, there is a clear demand for - phisticated Data Mining tools. Data mining tools play a

key role in the extraction of useful knowledge from databases. They can be used either to confirm a parti- lar hypothesis or to automatically find patterns. In the second case, which is - lated to this book, the

goal may be either to describe the main patterns present in dataset, what is known as descriptive Data Mining or to find patterns able to p- dict behaviour of specific attributes or features, known as predictive Data Mining.

While the first goal is associated with tasks like clustering, summarization and association, the second is found in classification and regression problems.

Fundamentals of Computational

Intelligence
Foundations of Computational Intelligence Volume 5
Genetic Algorithms for Applied CAD Problems
Tree-Structure based Hybrid Computational Intelligence

Computational Intelligence Techniques for Bioprocess Modelling, Supervision and Control

Foundations of Computational Intelligence Volume 2

Data Management is the process of

planning, coordinating and controlling data resources. More often, applications need to store and search a large amount of data. Managing Data has been continuously challenged by demands from various areas and applications and has evolved in parallel with advances in

hardware and computing techniques. This volume focuses on its recent advances and it is composed of five parts and a total of eighteen chapters. The first part of the book contains five contributions in the area of information retrieval and Web intelligence: a novel

approach to solving index selection problem, integrated retrieval from Web of documents and data, bipolarity in database querying, deriving data summarization through ontologies, and granular computing for Web intelligence. The second part of the book

contains four contributions in knowledge discovery area. Its third part contains three contributions in information integration and data security area. The remaining two parts of the book contain six contributions in the area of intelligent agents and applications of data

management in medical domain. Intelligent systems and technologies are increasing finding their ways in our daily lives. This book presents a sample of recent research results from key researchers. The contributions include: Introduction to intelligent systems; A

Fuzzy Density Analysis of Subgroups by means of DNA Oligonucleotides; Evolution of Cooperating Classification Rules with an Archiving Strategy to Underpin Collaboration; Designing Agents with Dynamic Capability; Localized versus Locality Preserving

Representation Methods in Face Recognition Tasks; Invariance Properties of Recurrent Neural Networks; Solving Bioinformatics Problems by Soft Computing Techniques; Transforming an Interactive Expert Code into a Statefull Service and a Multicoreenabled

System; Ro-WordNet with Paradigmatic Morphology and Subjectivity Mark-up; Special Cases of Relative Object Qualification using the AMONG Operator; Effective Speaker Tracking Strategies for Multi-party Human-Computer Dialogue; The Fuzzy

Interpolative Control for Passive Greenhouses; GPS safety system for airplanes; 3D Collaborative Interfaces for E-learning; Open Projects in Contemporary E-Learning; Software Platform for Archaeological Patrimony Inventory and Management. The book is

directed to the graduate students, researchers, professors and the practitioner of intelligent systems. During the last two decades, the idea of Semantic Web has received a great deal of attention. An extensive body of knowledge has emerged to describe

technologies that seek to help us create and use aspects of the Semantic Web. Ontology and agent-based technologies are understood to be the two important technologies here. A large number of articles and a number of books exist to describe the use individually of the two

technologies and the design of systems that use each of these technologies individually, but little focus has been given on how one can - sign systems that carryout integrated use of the two different technologies. In this book we describe ontology and agent-based

systems individually, and highlight advantages of integration of the two different and complementary technologies. We also present a methodology that will guide us in the design of the integrated ontology-based multi-agent systems and illustrate this methodology

on two use cases from the health and software engineering domain. This book is organized as follows: • Chapter I, Current issues and the need for ontologies and agents, describes existing problems associated with uncontrollable information overload and explains how

ontologies and agent-based systems can help address these - sues. • Chapter II, Introduction to multi-agent systems, defines agents and their main characteristics and features including mobility, communications and collaboration between different agents.

It also presents different types of agents on the basis of classifications done by different authors.

Automation and Computational Intelligence for Road Maintenance and Management A comprehensive computational intelligence toolbox for

solving problems in infrastructure management In Automation and Computational Intelligence for Road Maintenance and Management, a team of accomplished researchers delivers an incisive reference that covers the latest developments in computer technology

infrastructure management. The book contains an overview of foundational and emerging technologies and methods in both automation and computational intelligence, as well as detailed presentations of specific methodologies. The distinguished authors emphasize the

most recent advances in the maintenance and management of infrastructure robotics, automated inspection, remote sensing, and the applications of new and emerging computing technologies, including artificial intelligence, evolutionary computing, fuzzy logic,

genetic algorithms, knowledge discovery and engineering, and more. Automation and Computational Intelligence for Road Maintenance and Management explores a universal synthesis of the cutting edge in parameters and indices to evaluate models. It also includes: Thorough

introductions to management science and the latest methods of automation and the structure and framework of automation and computing intelligence

Comprehensive explorations of advanced image processing techniques, recent advances in fuzzy, and diagnosis

automation Practical discussions of segmentation and fragmentation and different types of features and feature extraction methods In-depth examinations of methods of classification along with various developed methodologies and models of

quantification, evaluation, and indexing in automation Perfect for postgraduate students in road and transportation engineering, evaluation, and assessment, Automation and Computational Intelligence for Road Maintenance and Management will also earn a place in

the libraries of researchers interested in or working with the evaluation and assessment of infrastructure.

Neural Networks, Fuzzy Systems, and Evolutionary Computation

Opportunities and Challenges for Next-Generation Applied Intelligence

Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing

Ontology-Based Multi-Agent Systems

Computational Intelligence for Privacy and Security

New Directions in Intelligent Interactive

Multimedia Systems and Services - 2

“The decomposition of the difficulties to be resolved, or the objects to be known, should be pushed up to the simplest elements ... Such elements are seized directly and completely by the intuition. ” René Descartes, Discours de la méthode (1637)

Wireless sensor networks have received significant attention because of their - portant role and many conveniences in our lives. Indeed, the recent and fast - vances in inexpensive sensor technology and wireless communications have made the design and development of large-

scale wireless sensor networks cost-effective and appealing to a wide range of mission-critical situations, including civilian, natural, industrial, and military applications, such as health and environmental monitoring, seism monitoring, industrial process automation, and battlefields s-

veillance, respectively. A wireless sensor network consists of a large number of - ny, low-powered devices, called sensors, which are randomly or deterministically deployed in a field of interest while collaborating and coordinating for the successful accomplishment of their mission.

These sensors suffer from very scarce resources and capabilities, such as bandwidth, storage, CPU, battery power (or - ergy), sensing, and communication, to name a few, with energy being the most critical one. The major challenge in the design process of this type of network is mainly due to

the limited capabilities of the sensors, and particularly, their energy, which makes them unreliable. Compared with data from general application domains, modern biological data has many unique characteristics. The goal of this book is to cover data and applications identifying new issues

and directions for future research in biomedical domain.

Foundations of Computational IntelligenceVolume 1: Learning and ApproximationSpringer Science & Business Media

This outstanding collection is designed to address the fundamental issues and

principles underlying the task of Artificial Intelligence.

Applied Mathematics and Computational Intelligence

Theoretical Foundations and Applications

Advances in Computational Intelligence

Recent Advances in Decision Making

Foundations of Computational Intelligence Volume 3

Methods and Supporting Technologies for Data Analysis

In reinforcement learning (RL) problems, learning agents sequentially execute actions with the goal of

maximizing a reward signal. The RL framework has gained popularity with the development of algorithms capable of mastering increasingly complex problems, but learning difficult tasks is often slow or infeasible when RL agents begin with no prior knowledge. The key insight behind "transfer learning" is that

generalization may occur not only within tasks, but also across tasks. While transfer has been studied in the psychological literature for many years, the RL community has only recently begun to investigate the benefits of transferring knowledge. This book provides an introduction to the RL

transfer problem and discusses methods which demonstrate the promise of this exciting area of research. The key contributions of this book are: Definition of the transfer problem in RL domains Background on RL, sufficient to allow a wide audience to understand discussed transfer concepts Taxonomy for transfer

methods in RL Survey of existing approaches In-depth presentation of selected transfer methods Discussion of key open questions By way of the research presented in this book, the author has established himself as the pre-eminent worldwide expert on transfer learning in sequential decision making

tasks. A particular strength of the research is its very thorough and methodical empirical evaluation, which Matthew presents, motivates, and analyzes clearly in prose throughout the book. Whether this is your initial introduction to the concept of transfer learning, or whether you are a

practitioner in the field looking for nuanced details, I trust that you will find this book to be an enjoyable and enlightening read. Peter Stone, Associate Professor of Computer Science Foundations of Computational Intelligence Volume 5: Function Approximation and Classification

Approximation theory is that area of analysis which is concerned with the ability to approximate functions by simpler and more easily calculated functions. It is an area which, like many other fields of analysis, has its primary roots in the mat- matics. The need for function approximation and

classification arises in many branches of applied mathematics, computer science and data mining in particular. This edited volume comprises of 14 chapters, including several overview Ch- ters, which provides an up-to-date and state-of-the art research covering the theory and algorithms of function approximation

and classification. Besides research articles and expository papers on theory and algorithms of function approximation and classification, papers on numerical experiments and real world applications were also encouraged. The Volume is divided into 2 parts: Part-I: Function Approximation and Classification –

Theoretical Foundations Part-II: Function Approximation and Classification – Success Stories and Real World Applications Part I on Function Approximation and Classification – Theoretical Foundations contains six chapters that describe several approaches Feature Selection, the use Decomposition

of Correlation Integral, Some Issues on Extensions of Information and Dynamic Information System and a Probabilistic Approach to the Evaluation and Combination of Preferences Chapter 1 “Feature Selection for Partial Least Square Based Dimension Red- tion” by Li and Zeng investigate a systematic

feature reduction framework by combing dimension reduction with feature selection. To evaluate the proposed framework authors used four typical data sets.

This book gathers selected papers presented at the conference of the Forum for Interdisciplinary Mathematics (FIM),

held at Palau Macaya, Barcelona, on 18 to 20 November, 2015. The event was co-organized by the University of Barcelona (Spain), the Spanish Royal Academy of Economic and Financial Sciences (Spain) and the Forum for Interdisciplinary Mathematics (India). This instalment of the conference was

presented with the title “Applied Mathematics and Computational Intelligence” and particularly focused on the use of Mathematics and Computational Intelligence techniques in a diverse range of scientific disciplines, as well as their applications in real-world problems. The book presents thirty peer-

reviewed research papers, organised into four topical sections: on Mathematical Foundations; Computational Intelligence and Optimization Techniques; Modelling and Simulation Techniques; and Applications in Business and Engineering. This book will be of great interest to anyone working in the area of

applied mathematics and computational intelligence and will be especially useful for scientists and graduate students pursuing research in these fields.

Computational Intelligence (CI) and Bioprocess are well-established research areas which have much to offer each other. Under the perspective of the CI

area, Biop- cess can be considered a vast application area with a growing number of complex and challenging tasks to be dealt with, whose solutions can contribute to boosting the development of new intelligent techniques as well as to help the refinement and s- cialization of many of the already existing techniques.

Under the perspective of the Bioprocess area, CI can be considered a useful repertoire of theories, methods and techniques that can contribute and offer interesting alternative approaches for solving many of its problems, particularly those hard to solve using conventional techniques. Although throughout the past

years CI and Bioprocess areas have accumulated substantial specific knowledge and progress has been quick and with a high degree of success, we believe there is still a long way to go in order to use the potentialities of the available CI techniques and knowledge at their full extent, as tools for supporting

problem solving in bioprocesses. One of the reasons is the fact that both areas have progressed steadily and have been continuously accumulating and refining specific knowledge; another reason is the high level of technical expertise demanded by each of them. The acquisition of technical skills, experience

and good insights in either of the two areas is very demanding and a hard task to be accomplished by any professional.

Networked Knowledge - Networked Media

From Sensor Deployment to Data Gathering

Multidisciplinary Computational

Intelligence Techniques: Applications in Business, Engineering, and Medicine

Function Approximation and Classification

Biomedical Data and Applications

This two-volume set LNCS 6691 and 6692 constitutes the

refereed proceedings of the 11th International Work-Conference on Artificial Neural Networks, IWANN 2011, held in Torremolinos-Málaga, Spain, in June 2011. The 154 revised papers were carefully reviewed

and selected from 202 submissions for presentation in two volumes. The first volume includes 69 papers organized in topical sections on mathematical and theoretical methods in computational

intelligence; learning and adaptation; bio-inspired systems and neuro-engineering; hybrid intelligent systems; applications of computational intelligence; new applications of brain-

computer interfaces; optimization algorithms in graphic processing units; computing languages with bio-inspired devices and multi-agent systems; computational intelligence in multimedia

processing; and biologically plausible spiking neural processing.

The purpose of the 10th ACIS International Conference on Software Engineering Artificial Intelligence, Networking and

Parallel/Distributed Computing (SNPD rd 2009), held in Daegu, Korea on May 27–29, 2009, the 3 International Workshop st on e-Activity (IWEA 2009) and the 1 International Workshop on Enterprise Architecture

Challenges and Responses (WEACR 2009) is to aim at bringing together researchers and scientist, businessmen and entrepreneurs, teachers and students to discuss the numerous fields of computer

science, and to share ideas and information in a meaningful way. Our conference officers selected the best 24 papers from those papers accepted for presentation at the conference in order to publish them in this

volume. The papers were chosen based on review scores submitted by members of the program committee, and underwent further rounds of rigorous review. In chapter 1, Igor Crk and Chris Gniady

propose a network-aware energy m- agement mechanism that provides a low-cost solution that can significantly reduce energy consumption in the entire system while maintaining

responsiveness of local interactive workloads. Their dynamic mechanisms reduce the decision delay before the disk is spun-up, reduce the number of erroneous spin-ups in local wo- stations, decrease

the network bandwidth, and reduce the energy consumption of individual drives. In chapter 2, Yoshihito Saito and Tokuro Matsuo describe a task allocation mechanism and its

performance concerning with software developing. They run simulations and discuss the results in terms of effective strategies of task allocation. New perspective technologies of genetic search and evolution

simulation represent the kernel of this book. The authors wanted to show how these technologies are used for practical problems solution. This monograph is devoted to specialists of CAD, intellectual

information technologies in science, biology, economics, sociology and others. It may be used by post-graduate students and students of specialties connected to the systems theory and system

analysis methods, information science, optimization methods, operations investigation and solution-making.

The term “Artificial Intelligence” has been used since 1956 and has become a

very popular research field. Generally, it is the study of the computations that enable a system to perceive, reason and act. In the early days, it was expected to achieve the same intelligent behavior as a

human, but found impossible at last. Its goal was thus revised to design and use of intelligent methods to make systems more ef- cient at solving problems. The term "Applied Intelligence" was thus

created to represent its practicality. It emphasizes applications of applied intelligent systems to solve real-life problems in all areas including engineering, science, industry, automation, robotics,

business, finance, medicine, bio-medicine, bio-informatics, cyberspace, and man-machine interactions. To endow the intelligent behavior of a system, many useful and interesting techniques have

been developed. Some of them are even borrowed from the na- ral observation and biological phenomenon. Neural networks and evolutionary computation are two examples of them. Besides, some other

heuristic approaches like data mining, adaptive control, intelligent manufacturing, autonomous agents, bio-informatics, reasoning, computer vision, decision support systems, expert s-

tems, fuzzy logic, robots, intelligent interfaces, internet technology, planning and scheduling, are also commonly used in applied intelligence. Computational Intelligence - Volume I

Hybrid Self-Organizing Modeling Systems
Global Optimization
Biologically-Inspired Optimisation Methods
Automation and Computational Intelligence for Road

Maintenance and Management Complex Networks

This volume includes the best papers of the IEEE/ACIS International Conference on Computer and Information Science, ICIS 2009, held on June 2009 in Shanghai,

China.

Intelligent paradigms are increasingly finding their ways in the design and development of decision support systems. This book presents a sample of recent research results from key researchers. The

contributions include: Introduction to intelligent systems in decision making - A new method of ranking intuitionistic fuzzy alternatives - Fuzzy rule base model identification by bacterial memetic algorithms - Discovering

associations with uncertainty from large databases - Dempster-Shafer structures, monotonic set measures and decision making - Interpretable decision-making models - A general methodology for managerial decision making - Supporting

decision making via verbalization of data analysis results using linguistic data summaries - Computational intelligence in medical decisions making. This book is directed to the researchers, graduate students, professors,

decision makers and to those who are interested to investigate intelligent paradigms in decision making.