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Financial Decision Making Using Computational Intelligence



Minjie Lin

Financial Decision Making Using Computational Intelligence Michael Doumpos, Constantin Zopounidis, Panos M. Pardalos, 2012-07-23 The increasing complexity of financial problems and the enormous volume of financial data often make it difficult to apply traditional modeling and algorithmic procedures In this context the field of computational intelligence provides an arsenal of particularly useful techniques These techniques include new modeling tools for decision making under risk and uncertainty data mining techniques for analyzing complex data bases and powerful algorithms for complex optimization problems Computational intelligence has also evolved rapidly over the past few years and it is now one of the most active fields in operations research and computer science This volume presents the recent advances of the use of computation intelligence in financial decision making The book covers all the major areas of computational intelligence and a wide range of problems in finance such as portfolio optimization credit risk analysis asset valuation financial forecasting and Financial Decision Making Using Computational Intelligence Michael Doumpos, Constantin Zopounidis, Panos M. Pardalos, 2012-07-21 The increasing complexity of financial problems and the enormous volume of financial data often make it difficult to apply traditional modeling and algorithmic procedures In this context the field of computational intelligence provides an arsenal of particularly useful techniques. These techniques include new modeling tools for decision making under risk and uncertainty data mining techniques for analyzing complex data bases and powerful algorithms for complex optimization problems Computational intelligence has also evolved rapidly over the past few years and it is now one of the most active fields in operations research and computer science This volume presents the recent advances of the use of computation intelligence in financial decision making The book covers all the major areas of computational intelligence and a wide range of problems in finance such as portfolio optimization credit risk analysis asset valuation financial forecasting and trading Agent-Based Computational Economics Shu-Heng Chen, 2017-09-19 This book aims to answer two questions that are fundamental to the study of agent based economic models what is agent based computational economics and why do we need agent based economic modelling of economy This book provides a review of the development of agent based computational economics ACE from a perspective on how artificial economic agents are designed under the influences of complex sciences experimental economics artificial intelligence evolutionary biology psychology anthropology and neuroscience This book begins with a historical review of ACE by tracing its origins From a modelling viewpoint ACE brings truly decentralized procedures into market analysis from a single market to the whole economy This book also reviews how experimental economics and artificial intelligence have shaped the development of ACE For the former the book discusses how ACE models can be used to analyse the economic consequences of cognitive capacity personality and cultural inheritance For the latter the book covers the various tools used to construct artificial adaptive agents including reinforcement learning fuzzy decision rules neural networks and evolutionary computation This book will be

of interest to graduate students researching computational economics experimental economics behavioural economics and **Developments in Mean-Variance Efficient Portfolio Selection** M. Agarwal, 2015-12-11 This research methodology book discusses new determinants for optimal portfolio selection It reviews the existing modelling framework and creates mean variance efficient portfolios from the securities companies on the National Stock Exchange Comparisons enable researchers to rank them in terms of their effectiveness in the present day Indian securities market Machine Learning - Volume 1: Foundation Of Artificial Intelligence Tshilidzi Marwala, 2018-10-22 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 Oxford Handbook of Computational Economics and Finance Shu-Heng Chen, Mak Kaboudan, Ye-Rong Du, 2018 The Oxford Handbook of Computational Economics and Finance provides a survey of both the foundations of and recent advances in the frontiers of analysis and action It is both historically and interdisciplinarily rich and also tightly connected to the rise of digital society It begins with the conventional view of computational economics including recent algorithmic development in computing rational expectations volatility and general equilibrium It then moves from traditional computing in economics and finance to recent developments in natural computing including applications of nature inspired intelligence genetic programming swarm intelligence and fuzzy logic Also examined are recent developments of network and agent based computing in economics How these approaches are applied is examined in chapters on such subjects as trading robots and automated markets. The last part deals with the epistemology of simulation in its trinity form with the integration of simulation computation and dynamics Distinctive is the focus on natural computationalism and the examination of the implications of intelligent machines for the future of computational economics and finance Not merely individual robots but whole integrated systems are extending their immigration to the world of Homo sapiens or Numerical Methods and Optimization in Finance Manfred Gilli, Dietmar Maringer, Enrico symbiogenesis Schumann, 2019-08-16 Computationally intensive tools play an increasingly important role in financial decisions Many financial problems ranging from asset allocation to risk management and from option pricing to model calibration can be efficiently handled using modern computational techniques Numerical Methods and Optimization in Finance presents such computational techniques with an emphasis on simulation and optimization particularly so called heuristics This book treats quantitative analysis as an essentially computational discipline in which applications are put into software form and tested empirically This revised edition includes two new chapters a self contained tutorial on implementing and using heuristics and an explanation of software used for testing portfolio selection models Postgraduate students researchers in programs on quantitative and computational finance and practitioners in banks and other financial companies can benefit from this second

edition of Numerical Methods and Optimization in Finance Meta-Heuristics Optimization Algorithms in Engineering, Business, Economics, and Finance Vasant, Pandian M., 2012-09-30 Optimization techniques have developed into a significant area concerning industrial economics business and financial systems With the development of engineering and financial systems modern optimization has played an important role in service centered operations and as such has attracted more attention to this field Meta heuristic hybrid optimization is a newly development mathematical framework based optimization technique Designed by logicians engineers analysts and many more this technique aims to study the complexity of algorithms and problems Meta Heuristics Optimization Algorithms in Engineering Business Economics and Finance explores the emerging study of meta heuristics optimization algorithms and methods and their role in innovated real world practical applications. This book is a collection of research on the areas of meta heuristics optimization algorithms in engineering business economics and finance and aims to be a comprehensive reference for decision makers managers engineers researchers scientists financiers and economists as well as industrialists **Rational Machines and Artificial** Intelligence Tshilidzi Marwala, 2021-03-31 Intelligent machines are populating our social economic and political spaces These intelligent machines are powered by Artificial Intelligence technologies such as deep learning They are used in decision making One element of decision making is the issue of rationality Regulations such as the General Data Protection Regulation GDPR require that decisions that are made by these intelligent machines are explainable Rational Machines and Artificial Intelligence proposes that explainable decisions are good but the explanation must be rational to prevent these decisions from being challenged Noted author Tshilidzi Marwala studies the concept of machine rationality and compares this to the rationality bounds prescribed by Nobel Laureate Herbert Simon and rationality bounds derived from the work of Nobel Laureates Richard Thaler and Daniel Kahneman Rational Machines and Artificial Intelligence describes why machine rationality is flexibly bounded due to advances in technology This effectively means that optimally designed machines are more rational than human beings Readers will also learn whether machine rationality can be quantified and identify how this can be achieved Furthermore the author discusses whether machine rationality is subjective Finally the author examines whether a population of intelligent machines collectively make more rational decisions than individual machines Examples in biomedical engineering social sciences and the financial sectors are used to illustrate these concepts Provides an introduction to the key questions and challenges surrounding Rational Machines including When do we rely on decisions made by intelligent machines What do decisions made by intelligent machines mean Are these decisions rational or fair Can we quantify these decisions and Is rationality subjective Introduces for the first time the concept of rational opportunity costs and the concept of flexibly bounded rationality as a rationality of intelligent machines and the implications of these issues on the reliability of machine decisions Includes coverage of Rational Counterfactuals group versus individual rationality and rational markets Discusses the application of Moore's Law and advancements in Artificial Intelligence as well as

developments in the area of data acquisition and analysis technologies and how they affect the boundaries of intelligent machine rationality Banking, Finance, and Accounting: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources, 2014-07-31 With the global economy still in recovery it is more important than ever for individuals and organizations to be aware of their money and its potential for both depreciation and growth Banking Finance and Accounting Concepts Methodologies Tools and Applications investigates recent advances and undertakings in the financial industry to better equip all members of the world economy with the tools and insights needed to weather any shift in the economic climate With chapters on topics ranging from investment portfolios to credit unions this multi volume reference source will serve as a crucial resource for managers investors brokers and all others within the banking industry Business Applications and Computational Intelligence Kevin E. Voges, Nigel Pope, 2006-01-01 This book deals with the computational intelligence field particularly business applications adopting computational intelligence techniques Provided by publisher **Driving Transformative Technology Trends With Cloud Computing Goodhait**, Saikat, 2024-08-08 Modern businesses face a pressing challenge in navigating the complex landscape of cloud computing 5G and artificial intelligence AI integration Despite these technologies transformative potential businesses often need help with bandwidth latency connection density and cost constraints This hinders the widespread adoption of cloud computing limiting its impact on various industries Driving Transformative Technology Trends With Cloud Computing offers a comprehensive solution for academic scholars seeking to understand and leverage the potential of cloud computing 5G and AI integration By exploring topics such as green cloud computing edge computing cloud cryptography and more scholars can gain valuable insights into the synergistic effects of these technologies This book provides a roadmap for leveraging the power of cloud computing and its integration with 5G and AI to drive innovation and growth in academia and beyond By offering practical insights and strategies this book equips scholars with the knowledge and tools needed to navigate the complexities of modern Genetic Algorithms in Applications Rustem technology integration and drive meaningful change in their respective fields Popa, 2012-03-21 Genetic Algorithms GAs are one of several techniques in the family of Evolutionary Algorithms that search for solutions to optimization problems by evolving better and better solutions Genetic Algorithms have been applied in science engineering business and social sciences This book consists of 16 chapters organized into five sections The first section deals with some applications in automatic control the second section contains several applications in scheduling of resources and the third section introduces some applications in electrical and electronics engineering The next section illustrates some examples of character recognition and multi criteria classification and the last one deals with trading systems These evolutionary techniques may be useful to engineers and scientists in various fields of specialization who need some optimization techniques in their work and who may be using Genetic Algorithms in their applications for the first time These applications may be useful to many other people who are getting familiar with the subject of Genetic Algorithms

Bio-Inspired Computational Algorithms and Their Applications Shangce Gao, 2012-03-07 Bio inspired computational algorithms are always hot research topics in artificial intelligence communities Biology is a bewildering source of inspiration for the design of intelligent artifacts that are capable of efficient and autonomous operation in unknown and changing environments It is difficult to resist the fascination of creating artifacts that display elements of lifelike intelligence thus needing techniques for control optimization prediction security design and so on Bio Inspired Computational Algorithms and Their Applications is a compendium that addresses this need It integrates contrasting techniques of genetic algorithms artificial immune systems particle swarm optimization and hybrid models to solve many real world problems The works presented in this book give insights into the creation of innovative improvements over algorithm performance potential applications on various practical tasks and combination of different techniques. The book provides a reference to researchers practitioners and students in both artificial intelligence and engineering communities forming a foundation for the development of the field Multidisciplinary Computational Intelligence Techniques: Applications in Business, **Engineering, and Medicine** Ali, Shawkat, Abbadeni, Noureddine, Batouche, Mohamed, 2012-06-30 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 Neutrosophic Sets and Systems, vol. 73/2024 {Proceedings of the "Mediterranean Conference on Three Decades of Neutrosophic and Plithogenic Theories and Applications" (MeCoNeT 2024)} Florentin Smarandache, Mohamed Abdel-Basset, Giorgio Nordo, Maikel Leyva-Vázguez, 2024-12-01 This volume contains the proceedings of the Mediterranean Conference on Neutrosophic Theory MeCoNeT 2024 held at the Accademia Peloritana dei Pericolanti of the University of Messina on September 24 25 2024 The event was organized by the MIFT Department Mathematics Computer Science Physics and Earth Sciences of the University of Messina marking the first international congress on neutrosophic theories outside the Americas This milestone has firmly established the Mediterranean region as a key hub for research in the rapidly growing field of neutrosophic theory The MeCoNeT 2024 conference drew over 100 participants from more than 15 countries with more than 50 scientific contributions selected through a rigorous peer review process The hybrid format of the event featuring in person sessions at the historical Accademia Peloritana dei Pericolanti and online parallel sessions allowed for broad international participation The conference thus offered an ideal platform for sharing interdisciplinary research and addressing contemporary challenges in mathematics and beyond **Computational Intelligence Techniques for** Sustainable Supply Chain Management Sanjoy Kumar Paul, Sandeep Kautish, 2024-05-24 Sustainable supply chain management involves integrating environmentally and financially viable practices into the complete supply chain lifecycle from product design and development to material selection and sourcing manufacturing packaging transportation and distribution A sustainable supply chain ensures balance between economic social and environmental performances such as

better assurance of human rights ethical work practices carbon footprint reduction waste management and resource efficiency Computational Intelligence Techniques for Sustainable Supply Chain Management presents state of the art computational intelligence techniques and applications for supply chain sustainability issues and logistic problems filling the gap between general textbooks on sustainable supply chain management and more specialized literature dealing with methods for computational intelligence This book focuses on addressing problems in advanced topics in the sustainable supply chain and will appeal to practitioners managers researchers academicians students and professionals interested in sustainable logistics sustainable procurement sustainable manufacturing sustainable inventory and production management sustainable scheduling sustainable transportation and sustainable network design Serves as a reference on computational intelligence enabled sustainable supply chains for graduate students in computer data science industrial engineering industrial ecology and business Explores key topics in sustainable supply chain informatics that is heuristics metaheuristics robotics simulation machine learning big data analytics and artificial intelligence Provides a foundation for industry leaders and professionals to understand recent and cutting edge methodologies and technologies in the domain of sustainable supply chain powered by computational intelligence techniques Nature-Inspired Computing: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources, 2016-07-26 As technology continues to become more sophisticated mimicking natural processes and phenomena also becomes more of a reality Continued research in the field of natural computing enables an understanding of the world around us in addition to opportunities for man made computing to mirror the natural processes and systems that have existed for centuries Nature Inspired Computing Concepts Methodologies Tools and Applications takes an interdisciplinary approach to the topic of natural computing including emerging technologies being developed for the purpose of simulating natural phenomena applications across industries and the future outlook of biologically and nature inspired technologies Emphasizing critical research in a comprehensive multi volume set this publication is designed for use by IT professionals researchers and graduate students studying intelligent Designing Stock Market Trading Systems Bruce Vanstone, Tobias Hahn, 2010-08-23 Most people know there is computing potential to make big money in the stock market but they don't know how to get started This work guides readers step by step through the authors methods for building rule based stock market trading systems **Modern Artificial Intelligence** Based on Soft Computing Techniques Patricia Melin, Oscar Castillo, 2025-07-05 This book describes what we can call modern artificial intelligence that includes the theoretical developments and applications of soft computing techniques Soft computing includes fuzzy logic neural networks and meta heuristic algorithms as well as their hybrid combinations There are papers with the main topics from type 1 to type 3 fuzzy logic which basically consists of a group of papers that propose new concepts and algorithms based on type 1 type 2 and type 3 fuzzy logic and their applications. There are also papers that present theory and practice of meta heuristics in diverse application areas There are interesting papers on different

applications of fuzzy logic neural networks and hybrid intelligent systems in medical problems In addition we can find papers describing applications of fuzzy logic neural networks and meta heuristics in robotics problems

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