Discovery

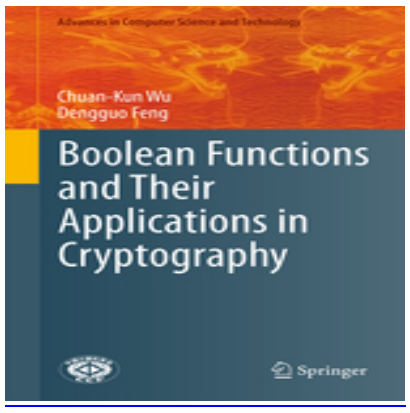
We SHARE to inspire and ignite ideas for
Information Systems Technology & Design (ISTD) Pillar!

The titles featured here are to give you a peek into the wealth of resources we have. We hope, through this will encourage you to explore and read further. Share with us topics of importance to ISTD and we can introduce relevant titles from some 400,000 eBooks we carry.

April 2016

COMPUTER SCIENCE

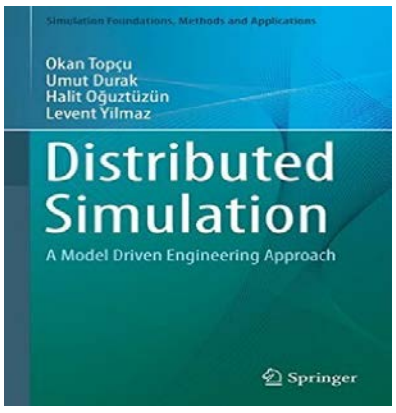
Boolean Functions and Their Applications in Cryptography



This book discusses different representations and cryptographic properties of Boolean functions and presents constructions of Boolean functions with good cryptographic properties. It provides a Walsh spectrum description of the traditional cryptographic properties of Boolean functions. This includes linear structure, propagation criterion, nonlinearity, and correlation immunity. You will be able to find out on how symmetric Boolean functions are constructed. You will also learn about Boolean permutations with good cryptographic properties.

Source: Advances in Computer Science and Technology (2016)

Distributed Simulation-A Model Driven Engineering Approach

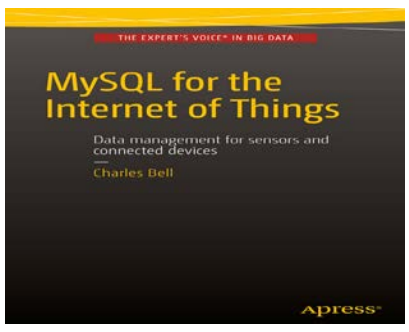


This book discusses distributed simulation (DS) from the Model Driven Engineering (MDE) angle. It shows how MDE influences the life cycle of the simulation development process and provides a guide to establishing a DS system in line with the MDE perspective, and a technical framework for the development of conceptual models. It also emphasizes the usefulness of DS via various case studies.

Source: Simulation Foundations, Methods and Applications (2016)

INTERNET OF THINGS (IOT)

MySQL for the Internet of Things



This book discusses problems that affect Internet of Things (IoT) developers. It also mentions current technologies and techniques that can help one manage, mine, and make sense of the data being collected via an internet database called MySQL. The book starts by introducing the MySQL database system. By reading this book, you will appreciate the difficulties posed by large amounts of data from connected devices and will learn to transform data to reduce storage volume. You'll also learn to store your IoT data across multiple database servers and will learn how to establish small MySQL database servers that can provide MySQL solutions among connected devices.

Source: Apress (2016)

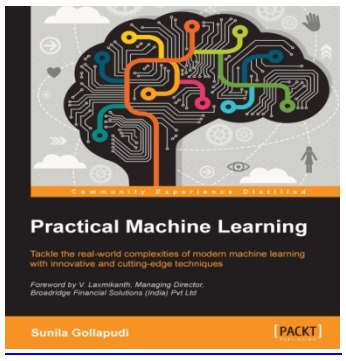
Intelligent Contextual Information Collection in Internet of Things

This article discusses contextual information collection and harvesting issues. This occurs when stationary sensing and computing devices, referred to as sources, that cannot communicate with each other due to being too far apart, or for energy efficiency rely on mobile IoT devices, referred to collectors, to release their acquired contextual information. That could include generating from IoT applications and smart metering. At the contact instances with the collectors, sources need to choose if they should provide the contextual information obtained so far immediately or if they should delay so that they can provide newer contextual information. The authors also introduce an intelligent context collection blueprint in IoT environments. They demonstrate via simulations with data to prove the effectiveness of their blueprint.

Source: International Journal of Wireless Information Networks (March 2016)

MACHINE LEARNING

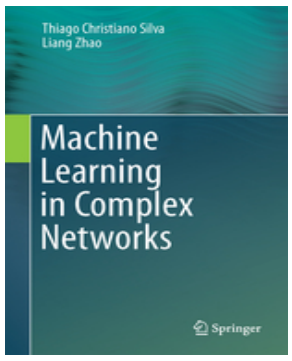
Practical Machine Learning



This book discusses Machine learning techniques and helps you to appreciate real-world applications of machine learning. It provides information on data science languages, Python, R and Julia, in addition to big data platforms including Spark, Hadoop, and Mahout. You will also learn about updates in Machine learning, with worked examples on Deep learning and Reinforcement learning.

Source: Packt Publishing (2016)

Machine Learning in Complex Networks

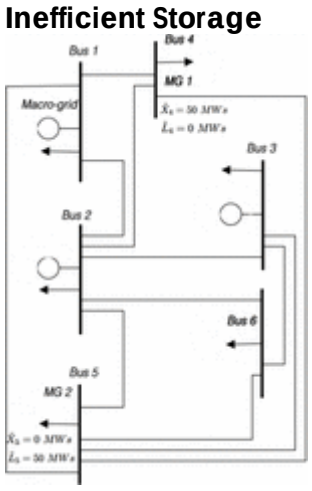


This book discusses features and advantages offered by complex networks in the machine learning domain. It starts by introducing complex networks and network-based machine learning. Later it mentions techniques based on complex networks for supervised, non-supervised, and semi-supervised learning. It places emphasis on a stochastic particle competition technique for both non-supervised and semi-supervised learning using a stochastic nonlinear dynamical system. An analytical analysis is provided too, so that one can predict how the proposed technique will work. Data reliability problems are also addressed in semi-supervised learning.

Source: Springer Publishing (2016)

POWER GRIDS

Cooperation and Storage Tradeoffs in Power-Grids under DC Power Flow Constraints and Inefficient Storage



Co-authored by Assistant Professor Tony Quek

The article studies the combined effects of cooperation and storage in mitigating the fluctuations of renewable energy in the context of distributed energy generation. Cooperation between the distributed generating units is limited by the network power flow (NPF) constraints and thermal limits of the transmission lines. Energy storage is affected by device capacity and imperfections. The authors formulated a stochastic optimization problem which minimizes the average cost of energy exchange, which has to meet user demands, the NPF and storage constraints. NPF constraints were formulated via a DC power flow model. The authors emphasize why there is a need for NPF constraints in modelling cooperation, because failure to take them into account may cause erroneous power sharing strategies to be developed.

Source: IEEE Power & Energy Society General Meeting (2015)

Distributed Production-Sharing Optimization and Application to Power Grid Networks

Work on asynchronous versions of the distributed alternating direction method of multipliers (ADMM) algorithm has been previously done. Based on this, the authors aim to develop convergence of a distributed asynchronous method for production-sharing problems over networks and test its workability. The algorithm allows for the relaxation of the synchronization constraint in distributed ADMM-based methods and for random local failures to occur in fully centralized methods. So the method can be used for the direct-current optimal power flow (DC-OPF) issue power transmission networks have.

Source: IEEE Transactions on Signal and Information Processing over Networks (March 2016)