

# AUTOMATIC LEARNING TECHNIQUES IN POWER SYSTEMS

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Louis A. Wehenkel

*Power Electronics and Power Systems Series*

# Automatic Learning Techniques In Power Systems

**David Baud**



## **Automatic Learning Techniques In Power Systems:**

Automatic Learning Techniques in Power Systems Louis A. Wehenkel, 2012-12-06 Automatic learning is a complex multidisciplinary field of research and development involving theoretical and applied methods from statistics computer science artificial intelligence biology and psychology Its applications to engineering problems such as those encountered in electrical power systems are therefore challenging while extremely promising More and more data have become available collected from the field by systematic archiving or generated through computer based simulation To handle this explosion of data automatic learning can be used to provide systematic approaches without which the increasing data amounts and computer power would be of little use Automatic Learning Techniques in Power Systems is dedicated to the practical application of automatic learning to power systems Power systems to which automatic learning can be applied are screened and the complementary aspects of automatic learning with respect to analytical methods and numerical simulation are investigated This book presents a representative subset of automatic learning methods basic and more sophisticated ones available from statistics both classical and modern and from artificial intelligence both hard and soft computing The text also discusses appropriate methodologies for combining these methods to make the best use of available data in the context of real life problems Automatic Learning Techniques in Power Systems is a useful reference source for professionals and researchers developing automatic learning systems in the electrical power field

*Complex System Modelling and Control Through Intelligent Soft Computations* Quanmin Zhu, Ahmad Taher Azar, 2014-11-29 The book offers a snapshot of the theories and applications of soft computing in the area of complex systems modeling and control It presents the most important findings discussed during the 5th International Conference on Modelling Identification and Control held in Cairo from August 31 September 2 2013 The book consists of twenty nine selected contributions which have been thoroughly reviewed and extended before their inclusion in the volume The different chapters written by active researchers in the field report on both current theories and important applications of soft computing Besides providing the readers with soft computing fundamentals and soft computing based inductive methodologies algorithms the book also discusses key industrial soft computing applications as well as multidisciplinary solutions developed for a variety of purposes like windup control waste management security issues biomedical applications and many others It is a perfect reference guide for graduate students researchers and practitioners in the area of soft computing systems modeling and control

**Computational Techniques for Voltage Stability Assessment and Control** Venkataramana Ajarapu, 2007-05-27 This book provides comprehensive details on continuation power flow and reviews concepts in bifurcation theory and continuation methods for assessing power system voltage stability The author proposes a uniform framework that provides computational approaches for both short term and long term voltage stability phenomena Readers can access the author's web based simulation tools which are based on the advice in this book to simulate tests of systems up to the size of 200 buses

Artificial Intelligence

Applications and Innovations Ilias Maglogiannis, Kostas Karpouzis, 2006-08-29 Artificial Intelligence applications build on a rich and proven theoretical background to provide solutions to a wide range of real life problems. The ever expanding abundance of information and computing power enables researchers and users to tackle highly interesting issues for the first time such as applications providing personalized access and interactivity to multimodal information based on preferences and semantic concepts or human machine interface systems utilizing information on the affective state of the user. The purpose of the 3rd IFIP Conference on Artificial Intelligence Applications and Innovations AIAI is to bring together researchers, engineers and practitioners interested in the technical advances and business and industrial applications of intelligent systems. AIAI 2006 is focused on providing insights on how AI can be implemented in real world applications.

**AI and Blockchain in Smart Grids** Shrikant Tiwari, Amit Kumar Tyagi, 2025-04-17 AI and Blockchain in Smart Grids Fundamentals, Methods and Applications examines the cutting edge solution that combines artificial intelligence AI, blockchain technology and digital twin concepts to innovate the management and optimization of electrical power distribution. This innovative approach enhances the resilience, efficiency and security of electricity grids while providing real time insights for grid operators and stakeholders. The book covers such key elements as using Digital twins in smart grids to gather real time data from various grid components, AI powered analytics to process the data generated by digital twins and to analyze this information to detect patterns, predict grid failures and recommend adjustments to enhance a grid's performance. Blockchain based security to ensure the secure and transparent management of data within a smart grid, especially a tamper resistant ledger to store information related to energy production, distribution and consumption. Decentralized data sharing to allow grid data to be shared securely among various stakeholders including utilities, regulators and consumers. Grid optimization techniques to improve electricity distribution, reduce energy waste and balance supply and demand efficiently. Select real world case studies and practical examples demonstrate how AI and blockchain are currently being applied to enhance grid management, energy distribution and sustainability. By explaining to researchers, academics and students how AI and blockchain can revolutionize electricity distribution and make grids smarter, more secure and environmentally friendly, the book points to a future where grid operators, regulators and consumers will benefit from real time data and a resilient, efficient energy ecosystem. *IEEE/PES Transmission and Distribution Conference and Exhibition 2002: Asia Pacific*, 2002 **Conference Proceedings** IEEE Power Engineering Society. General Meeting, 2003 *Machine Learning, ECML- ...*, 2000 2nd International Conference on Advances in Power System Control, Operation & Management, 1994 *Principles of Data Mining and Knowledge Discovery*, 2001 **Application of Automatic Learning Methods to Power Systems** M. Pavella, Louis Wehenkel, 1996 **American Book Publishing Record Cumulative 1998** R R Bowker Publishing, 1999-03 Conference Papers from the Summer Meeting IEEE Power Engineering Society, 2000 **The Cumulative Book Index**, 1998 A world list of books in the English language *Servomechanisms: Bulletin of Automatic*

*and Manual Control Abstracts* ,1968      **DECISION SUPPORT SYSTEMS: THE INTERNATIONAL JOURNAL** ,1998  
**Real-time Grid Reliability Management** ,2008      Electrical & Electronics Abstracts ,1997      **Artificial  
Intelligence Techniques in Power Systems** Kevin Warwick,Arthur Ekwue,Raj Aggarwal,Institution of Electrical  
Engineers,1997 The intention of this book is to give an introduction to and an overview of the field of artificial intelligence  
techniques in power systems with a look at various application studies      **The Summary of Engineering Research**  
University of Illinois at Urbana-Champaign. Office of Engineering Publications,1989

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