

1. Record Nr.	UNINA9910780291903321
Titolo	Neural networks for instrumentation, measurement, and related industrial applications [[electronic resource] /] / edited by Sergey Ablameyko ... [et al.]
Pubbl/distr/stampa	Amsterdam ; Burke, VA, : IOS Press Tokyo, : Ohmsha, c2003
ISBN	9786610505760 1-280-50576-1 600-00-0498-2 1-60129-447-6
Descrizione fisica	1 online resource (340 p.)
Collana	NATO science series. Series III, Computer and systems sciences, , 1387-6694 ; ; v. 185
Altri autori (Persone)	AblameykoSergey <1956->
Disciplina	006.32
Soggetti	Neural networks (Computer science) Neural networks (Computer science) - Industrial applications
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"Published in cooperation with NATO Scientific Affairs Division."
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	""Cover""; ""Title page""; ""Preface""; ""Contents""; ""1. Introduction to Neural Networks for Instrumentation, Measurement, and Industrial Applications""; ""1.1 The scientific and application motivations""; ""1.2 The scientific and application objective""; ""1.3 The book organization""; ""1.4 The book topics""; ""1.5 The socio-economical implications""; ""2. The Fundamentals of Measurement Techniques""; ""2.1 The measurement concept""; ""2.2 A big scientific and technical problem""; ""2.3 The uncertainty concept""; ""2.4 Uncertainty: definitions and methods for its determination"" ""2.5 How can the results of different measurements be compared?"" 2.6 The role of the standard and the traceability concept""; ""2.7 Conclusions""; ""3. Neural Networks in Intelligent Sensors and Measurement Systems for Industrial Applications""; ""3.1 Introduction to intelligent measurement systems for industrial applications""; ""3.2 Design and implementation of neural-based systems for industrial applications""; ""3.3 Application of neural techniques for intelligent

sensors and measurement systems"; "4. Neural Networks in System Identification"; "4.1 Introduction"; "4.2 The main steps of modeling"; "4.3 Black box model structures"; "4.4 Neural networks"; "4.5 Static neural network architectures"; "4.6 Dynamic neural architectures"; "4.7 Model parameter estimation, neural network training"; "4.8 Model validation"; "4.9 Why neural networks?"; "4.10 Modeling of a complex industrial process using neural networks: special difficulties and solutions (case study)"; "4.11 Conclusions"; "5. Neural Techniques in Control"; "5.1 Neural control"; "5.2 Neural approximations"; "5.3 Gradient algebra"; "5.4 Neural modeling of dynamical systems"; "5.5 Stabilization"; "5.6 Tracking"; "5.7 Optimal control"; "5.8 Reinforcement learning"; "5.9 Concluding remarks"; "6. Neural Networks for Signal Processing in Measurement Analysis and Industrial Applications: the Case of Chaotic Signal Processing"; "6.1 Introduction"; "6.2 Multilayer neural networks"; "6.3 Dynamical systems"; "6.4 How can we verify if the behavior is chaotic?"; "6.5 Embedding parameters"; "6.6 Lyapunov's exponents"; "6.7 A neural network approach to compute the Lyapunov's exponents"; "6.8 Prediction of chaotic processes by using neural networks"; "6.9 State space reconstruction"; "6.10 Conclusion"; "7. Neural Networks for Image Analysis and Processing in Measurements, Instrumentation and Related Industrial Applications"; "7.1 Introduction"; "7.2 Digital imaging systems"; "7.3 Image system design parameters and modeling"; "7.4 Multisensor image classification"; "7.5 Pattern recognition and classification"; "7.6 Image shape and texture analysis"; "7.7 Image compression"; "7.8 Nonlinear neural networks for image compression"; "7.9 Linear neural networks for image compression"

---

## Sommario/riassunto

Aims of this book are to disseminate wider and in-depth theoretical and practical knowledge about neural networks in measurement, instrumentation and the related industrial applications. It also creates a clear consciousness about the effectiveness of these techniques as well as the measurement and instrumentation application problems in industrial environments. Finally, it wants to promote the practical use of these techniques in the industry.

---