1. Record Nr. UNINA9910299577403321

Titolo	Dynamic Neuroscience : Statistics, Modeling, and Control / / edited by Zhe Chen, Sridevi V. Sarma
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2018
ISBN	3-319-71976-9
Edizione	[1st ed. 2018.]
Descrizione fisica	1 online resource (XXI, 328 p. 80 illus., 71 illus. in color.)
Disciplina	610.28
Soggetti	Biomedical engineering Signal processing Image processing Speech processing systems Bioinformatics Neurosciences Statistics Neural networks (Computer science) Biomedical Engineering and Bioengineering Signal, Image and Speech Processing Computational Biology/Bioinformatics Statistics for Engineering, Physics, Computer Science, Chemistry and Earth Sciences Mathematical Models of Cognitive Processes and Neural Networks
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- Part I Statistics & Signal Processing -- Characterizing Complex, Multi-scale Neural Phenomena Using State-Space Models -- Latent Variable Modeling of Neural Population Dynamics -- What Can Trial-to-Trial Variability Tell Us? A Distribution-Based Approach to Spike Train Decoding in the Rat Hippocampus and Entorhinal Cortex -- Sparsity Meets Dynamics: Robust Solutions to Neuronal Identification and Inverse Problems -- Artifact Rejection for Concurrent TMS-EEG Data -- Part II Modeling & Control Theory -- Characterizing Complex

Human Behaviors and Neural Responses Using Dynamic Models -- Brain-Machine Interfaces -- Control-theoretic Approaches for Modeling, Analyzing and Manipulating Neuronal (In)activity -- From Physiological Signals to Pulsatile Dynamics: A Sparse System Identification Approach -- Neural Engine Hypothesis -- Inferring Neuronal Network Mechanisms Underlying Anesthesia induced Oscillations Using Mathematical Models -- Epilogue.

Sommario/riassunto

This book shows how to develop efficient quantitative methods to characterize neural data and extra information that reveals underlying dynamics and neurophysiological mechanisms. Written by active experts in the field, it contains an exchange of innovative ideas among researchers at both computational and experimental ends, as well as those at the interface. Authors discuss research challenges and new directions in emerging areas with two goals in mind: to collect recent advances in statistics, signal processing, modeling, and control methods in neuroscience; and to welcome and foster innovative or cross-disciplinary ideas along this line of research and discuss important research issues in neural data analysis. Making use of both tutorial and review materials, this book is written for neural, electrical, and biomedical engineers; computational neuroscientists; statisticians; computer scientists; and clinical engineers. Presents innovative methodological and algorithmic development in statistics, modeling, control, and signal processing for neural data analysis; Includes a coherent framework for a broad class of neural signal processing and control problems in neuroscience; Covers a wide range of representative case studies in neuroscience applications.