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Nota di contenuto	Bioelectrical Signal Processing in Cardiac and Neurological Applications; Copyright Page; Contents; Preface; Chapter 1. Introduction; 1.1 Biomedical Signal Processing: Objectives and Contexts; 1.2 Basics of Bioelectrical Signals; 1.3 Signal Acquisition and Analysis; 1.4 Performance Evaluation; Bibliography; Chapter 2. The Electroencephalogram-A Brief Background; 2.1 The Nervous System; 2.2 The EEG-Electrical Activity Measured on the Scalp; 2.3 Recording Techniques; 2.4 EEG Applications; Bibliography; Chapter 3. EEG Signal Processing; 3.1 Modeling the EEG Signal; 3.2 Artifacts in the EEG 3.3 Nonparametric Spectral Analysis 3.4 Model-based Spectral Analysis; 3.5 EEG Segmentation; 3.6 Joint Time-Frequency Analysis; Bibliography; Problems; Chapter 4. Evoked Potentials; 4.1 Evoked Potential Modalities; 4.2 Noise Characteristics; 4.3 Noise Reduction by Ensemble Averaging; 4.4 Noise Reduction by Linear Filtering; 4.5 Single-Trial

Analysis Using Basis Functions; 4.6 Adaptive Analysis Using Basis Functions; 4.7 Wavelets; Bibliography; Problems; Chapter 5. The Electromyogram; 5.1 The Electrical Activity of Muscles; 5.2 Amplitude Estimation in the Surface EMG  
5.3 Spectral Analysis of the Surface EMG 5.4 Conduction Velocity Estimation; 5.5 Modeling the Intramuscular EMG; 5.6 Intramuscular EMG Signal Decomposition; Bibliography; Problems; Chapter 6. The Electrocardiogram-A Brief Background; 6.1 Electrical Activity of the Heart; 6.2 Generation and Recording of an ECG; 6.3 Heart Rhythms; 6.4 Heartbeat Morphologies; 6.5 Noise and Artifacts; 6.6 Clinical Applications; Bibliography; Chapter 7. ECG Signal Processing; 7.1 Baseline Wander; 7.2 Powerline Interference; 7.3 Muscle Noise Filtering; 7.4 QRS Detection; 7.5 Wave Delineation; 7.6 Data Compression Bibliography Problems; Chapter 8. ECG Signal Processing: Heart Rate Variability; 8.1 Acquisition and RR Interval Conditioning; 8.2 Time Domain Measures; 8.3 Heart Rhythm Representations; 8.4 Spectral Analysis of Heart Rate Variability; 8.5 Clustering of Beat Morphologies; 8.6 Dealing with Ectopic Beats; 8.7 Interaction with Other Physiological Signals; Bibliography; Problems; Appendix A. Review of Important Concepts; A.1 Matrix Fundamentals; A.2 Discrete-Time Stochastic Processes; Bibliography; Appendix B. Symbols and Abbreviations; B.1 Mathematical Symbols; B.2 Abbreviations; Index

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### Sommario/riassunto

The analysis of bioelectrical signals continues to receive wide attention in research as well as commercially because novel signal processing techniques have helped to uncover valuable information for improved diagnosis and therapy. This book takes a unique problem-driven approach to biomedical signal processing by considering a wide range of problems in cardiac and neurological applications-the two "heavyweight" areas of biomedical signal processing. The interdisciplinary nature of the topic is reflected in how the text interweaves physiological issues with related methodological considerations

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