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Altri autori (Persone)	TurkAhmet S. <1977-> HocaogluA. Koksai <1967-> (Ali Koksai) VertiyAlexey A. <1947->
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Nota di contenuto	Subsurface Sensing; Contents; Contributors; Preface; 1 Introduction; Relevant Resources; References; 2 Sensor Types; 2.1 Introduction; 2.2 Ground-Penetrating Radar; 2.3 Electromagnetic Induction Detector; 2.4 Microwave Tomography Method; 2.5 Acoustic and Seismic Sensor; 2.6 Optical Detectors (Infrared and Hyperspectral); 2.7 Biochemical Sensors; 2.8 Nuclear Sensors; References; 3 Ground-Penetrating Radar; 3.1 Introduction; 3.2 GPR System Design; 3.3 GPR Hardware; 3.4 GPR Antennas; 3.5 Signal-Processing Techniques; 3.6 Imaging Algorithms; 3.7 Numerical Modeling of GPR 3.8 Detection and Classification Algorithms References; 4 Electromagnetic Induction; 4.1 Introduction to Metal Detectors; 4.2 Inductive Metal Detectors: Types of Probes, Excitation, and Coil Arrangements; 4.3 Influence of the Soil Properties; 4.4 Modeling Inductive Metal Detectors; 4.5 Advanced Signal-Processing and Pattern Recognition Systems for Metal Detection; 4.6 Conclusions; References; 5 Microwave Tomography; 5.1 Overview; 5.2 Electromagnetic

Tomography; 5.3 Multifrequency Tomographic Method; 5.4 Diffraction Multiview Tomographic Method in the Microwave and Millimeter-Wave Bands  
5.5 Nonlinear Inversion Algorithms References; 6 Acoustic and Seismic Sensors; 6.1 Overview; 6.2 Operating Principles and Sensor Physics; 6.3 Sensor Installation; 6.4 Multicomponent Techniques; 6.5 Limitations; 6.6 Future Prospects; References; 7 Auxiliary Sensors; 7.1 Overview; 7.2 Biological and Chemical Methods of Explosive Detection; 7.3 Nuclear Quadrupole Resonance; 7.4 X-ray, Gamma-ray, and Neutron Techniques; 7.5 Electric Impedance Tomography; 7.6 Infrared and Hyperspectral Systems; References; 8 Multisensor Fusion; 8.1 Preview; 8.2 Data Association; 8.3 Fusion Architectures  
8.4 Probabilistic Sensor Fusion 8.5 Fuzzy Integrals for Information Fusion; 8.6 Artificial Neural Networks; 8.7 Summary; References; 9 Geophysical Applications; 9.1 Introduction; 9.2 Electromagnetic Properties of Soils; 9.3 Hydrogeophysics; 9.4 Contaminant Remediation; 9.5 Agricultural Geophysics; 9.6 Archaeology and Cultural Heritage; References; 10 Remote Sensing and Security; 10.1 Introduction; 10.2 Through-Wall Imaging and Detection; 10.3 Millimeter-Wave Band Passive Imaging; References; 11 Mine Detection; 11.1 The Landmine Problem; 11.2 Overview of Demining Techniques  
11.3 Advanced Electromagnetic Induction Sensor 11.4 Ground-Penetrating Radar; 11.5 Electronically Sensors; 11.6 Chemical Sensor Arrays for Mine Detection; 11.7 Sensor Fusion; 11.8 ALIS: A Handheld Multisensor System for Landmine Detection; 11.9 Conclusions; References; 12 Transportation and Civil Engineering; 12.1 Introduction; 12.2 Proper Sensor Types; 12.3 Ground-Penetrating Radar for Road Characterization; 12.4 Eddy Current Tomography for Three-Dimensional Imaging in Conductive Materials; 12.5 Ultrasonic Methods for Nondestructive Testing; 12.6 Impact Echo  
12.7 Diagnostic Methods for Concrete and Bridges by Acoustic Emission

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## Sommario/riassunto

This book provides readers with a solid understanding of the capabilities and limitations of the techniques used for buried object detection. Presenting theory along with applications and the existing technology, it covers the most recent developments in hardware and software technologies of sensor systems with a focus on primary sensors such as Ground Penetrating Radar (GPR) and auxiliary sensors such as Nuclear Quadruple Resonance (NQR). It is essential reading for students, practitioners, specialists, and academicians involved in the design and implementation of buried object detection sens

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