

# Preface

Nowadays, it has been accepted that studies on cultural heritage made from just archaeological excavation often cannot provide sufficient and satisfactory information to determine the essential cultural and economic structures of the ancient inhabitants of a region. These researches need to be integrated with data from other disciplines to help thoroughly in delineating the history of the area investigated.

In the last 20 years, various scientific disciplines have provided effective tools for an integrated approach to the knowledge, analysis and safeguard of the Cultural Heritage. In particular, geophysical prospecting methods represent an entire range of non-invasive surveying techniques, including data processing and image representation of the different data sets collected from the surface, which can enhance the knowledge of the investigated area. This book was written to appeal to researchers employing the Ground Penetrating Radar method to study the characterization and protection of archaeological and historical sites, contained in the urban territories of both major cities and small historical centres.

*GPR Remote Sensing in Archaeology* introduces Ground Penetrating Radar via understanding the complexity of this geophysical method through a simulator. The book continues with several chapters covering many of the signal and image processes needed to take the raw recorded radargrams, and showing the steps to create 3D data volumes that can be effectively used in the interpretation of subsurface archaeology. Guidelines for generating useful depth slice maps from random GPS tracks or from regularly spaced surveys using interpolation, as well as specialized processing required for hi-density surveying using the latest multi-channel GPR systems are presented. Imaging techniques such as overlay analysis for placing important reflections through the depth record into comprehensive 2D maps are given extra attention. The book gives examples of case studies made at a variety of archaeological sites from around the world. Although the book is designed primarily for readers interested in archaeological investigations, ge-engineering and geotechnical practitioners may also benefit by incorporating some of the processing techniques outlined.

As described in this book, Ground Penetrating Radar (GPR) technique is bringing new powerful tools to help archaeologists and historians in their quest of discovery and exploration. Even though this field is still in progress, the different contributions in this book give us a glimpse of the things to come and the great potential of GPR in archaeology.

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<http://www.springer.com/978-3-642-31856-6>

GPR Remote Sensing in Archaeology

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2013, XI, 233 p., Hardcover

ISBN: 978-3-642-31856-6