



# Introduction to Audio Analysis: A MATLAB® Approach

By Theodoros Giannakopoulos, Aggelos Pikrakis



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*Introduction to Audio Analysis* serves as a standalone introduction to audio analysis, providing theoretical background to many state-of-the-art techniques. It covers the essential theory necessary to develop audio engineering applications, but also uses programming techniques, notably MATLAB®, to take a more applied approach to the topic. Basic theory and reproducible experiments are combined to demonstrate theoretical concepts from a practical point of view and provide a solid foundation in the field of audio analysis.

Audio feature extraction, audio classification, audio segmentation, and music information retrieval are all addressed in detail, along with material on basic audio processing and frequency domain representations and filtering. Throughout the text, reproducible MATLAB® examples are accompanied by theoretical descriptions, illustrating how concepts and equations can be applied to the development of audio analysis systems and components. A blend of reproducible MATLAB® code and essential theory provides enable the reader to delve into the world of audio signals and develop real-world audio applications in various domains.

- Practical approach to signal processing: The first book to focus on audio analysis from a signal processing perspective, demonstrating practical implementation alongside theoretical concepts
- Bridge the gap between theory and practice: The authors demonstrate how to apply equations to real-life code examples and resources, giving you the technical skills to develop real-world applications
- Library of MATLAB code: The book is accompanied by a well-documented library of MATLAB functions and reproducible experiments



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"...written in a sparse but graceful style, skillfully edited, and well bound. It is mostly suitable for the reader seriously interested in audio analysis who likes a mathematical programming approach to the subject."-*Computing Reviews*

"This new book on audio content analysis and the associated toolbox is highly recommended to audio signal processing practitioners. It can even serve as a first introduction to the more general area of pattern classification."--*Computing Reviews*, November 13, 2014

"...excellent starting point for those who would like to learn about audio analysis techniques and develop practical skills for using MATLAB to perform audio analysis tasks." -- *Noise Control Engineering Journal*, May-June 2014

### **About the Author**

Theodoros Giannakopoulos is a Research Associate in the Institute of Informatics and Telecommunications, National Center for Scientific Research DEMOKRITOS, Greece and in the Department of Informatics & Telecommunications of the University of Athens (UOA). He received his Ph.D. degree in Audio Analysis from UOA, in 2009. His main research interests are pattern recognition, data mining, and multimedia analysis.

Aggelos Pikrakis is a Lecturer in the Department of Informatics at the University of Piraeus. His research interests stem from the fields of pattern recognition, audio and image processing, and music information retrieval. He is also the co-author of Introduction to Pattern Recognition: A MATLAB Approach (Academic Press, 2010).

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