



# Digital Signal Processing and Spectral Analysis for Scientists: Concepts and Applications (Signals and Communication Technology)

By *Silvia Maria Alessio*

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## Digital Signal Processing and Spectral Analysis for Scientists: Concepts and Applications (Signals and Communication Technology) By Silvia Maria Alessio

This book covers the basics of processing and spectral analysis of monovariate discrete-time signals. The approach is practical, the aim being to acquaint the reader with the indications for and drawbacks of the various methods and to highlight possible misuses. The book is rich in original ideas, visualized in new and illuminating ways, and is structured so that parts can be skipped without loss of continuity. Many examples are included, based on synthetic data and real measurements from the fields of physics, biology, medicine, macroeconomics etc., and a complete set of MATLAB exercises requiring no previous experience of programming is provided. Prior advanced mathematical skills are not needed in order to understand the contents: a good command of basic mathematical analysis is sufficient. Where more advanced mathematical tools are necessary, they are included in an Appendix and presented in an easy-to-follow way. With this book, digital signal processing leaves the domain of engineering to address the needs of scientists and scholars in traditionally less quantitative disciplines, now facing increasing amounts of data.

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### **Editorial Review**

#### Review

“It is intended for scientists and engineers, practitioners as well as students, who are interested in the practical application of methods, and less interested in the mathematical and theoretical background. ... It is a marvelous and very practical book with an awful lot of information.” (A. Bultheel, *Mathematical Reviews*, August, 2016)

#### From the Back Cover

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#### About the Author

Silvia Maria Alessio is Assistant Professor of Digital Signal Processing and Physics of the Atmosphere at University of Torino, Italy. Her research focuses mainly on geophysics, more precisely the physics of atmosphere and of environmental, climatic and paleo-climatic problems.

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