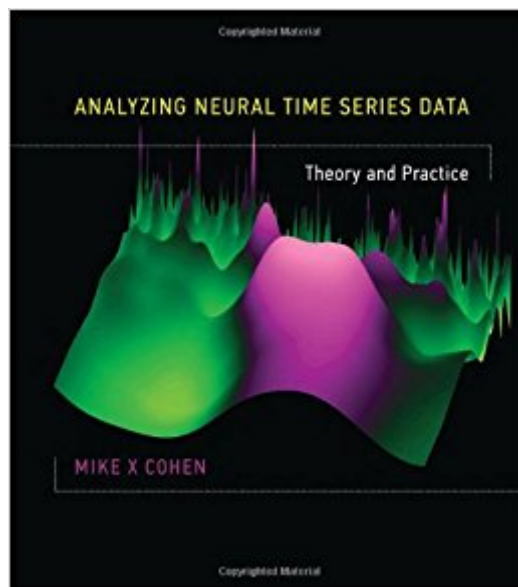




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# Analyzing Neural Time Series Data: Theory And Practice (Issues In Clinical And Cognitive Neuropsychology)



## Synopsis

This book offers a comprehensive guide to the theory and practice of analyzing electrical brain signals. It explains the conceptual, mathematical, and implementational (via Matlab programming) aspects of time-, time-frequency- and synchronization-based analyses of magnetoencephalography (MEG), electroencephalography (EEG), and local field potential (LFP) recordings from humans and nonhuman animals. It is the only book on the topic that covers both the theoretical background and the implementation in language that can be understood by readers without extensive formal training in mathematics, including cognitive scientists, neuroscientists, and psychologists. Readers who go through the book chapter by chapter and implement the examples in Matlab will develop an understanding of why and how analyses are performed, how to interpret results, what the methodological issues are, and how to perform single-subject-level and group-level analyses. Researchers who are familiar with using automated programs to perform advanced analyses will learn what happens when they click the "analyze now" button. The book provides sample data and downloadable Matlab code. Each of the 38 chapters covers one analysis topic, and these topics progress from simple to advanced. Most chapters conclude with exercises that further develop the material covered in the chapter. Many of the methods presented (including convolution, the Fourier transform, and Euler's formula) are fundamental and form the groundwork for other advanced data analysis methods. Readers who master the methods in the book will be well prepared to learn other approaches.

## Book Information

Series: Issues in Clinical and Cognitive Neuropsychology

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## Customer Reviews

For years, I have wished for a comprehensive and pragmatic volume that really explained -- in plain English -- the many complex techniques that are so often used in electrophysiological research. Although there are chapters in handbooks, and even entire books on digital signal processing, none are as comprehensive, pragmatic, lucid, or entertaining as *Analyzing Neural Time Series Data*. (John J. B. Allen, University of Arizona) This impressive book is something I have been hoping for for years. It is meticulously organized to lead the knowledgeable novice to time series analyses from concept to actual implementation. Importantly, it is written to assume little advance knowledge of the topic, but to result in actionable understanding. Michael X Cohen has done the community a great service. (George R. Mangun, University of California, Davis) This book provides a technically rigorous, practical, and thorough survey of the major computational and statistical methods used in the time-frequency analysis of electrophysiological signals. Written in a lucid and engaging manner, Cohen's treatment will prove essential reading for both students and seasoned scholars, offering the former a clear roadmap into this exciting area of research and offering the latter an invaluable reference for nearly all of the major techniques. In putting this treatise together Cohen has done a great service for the burgeoning field of cognitive electrophysiology. (Michael J. Kahana, University of Pennsylvania)

Mike X Cohen is a Research Scientist in the Department of Psychology at the University of Amsterdam.

This book explains the mathematical basis of time series analysis for neuroscientists, not mathematicians. Material is presented informally - not a single proof to be found in the book. This is a plus for someone who wants to learn analysis techniques for neuroscience. Fully recommend for anyone who does or is interested in time-frequency analysis of MEG/EEG data. Excellent resource. Would absolutely buy again, a copy for everyone in my lab if I had the choice.

This is THE best book on EEG data analysis I've ever read, though I think the title is a bit misleading as neural time series oftentimes refers to neural spike trains or local field potentials.

This is a clearly written introduction to performing time series analysis of EEG data. It is tied to a series of MATLAB programs available on the author's website that show you how these analyses can be implemented in code. Highly recommended.

Great book. Doesn't go deep, but is very broad, covering lots of topics. Great introduction to processing EEG data.

received it right on time and in excellent condition.the book is awesome too and definitely worths reading

Great overview and introduction to the time frequency domain.

written for anyone from students to professionals who want to learn about the concepts behind time-frequency EEG/MEG analyses without needing a mathematical background.

I love this book with every oscillatory mechanism in my body.....

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