1. Record Nr. UNINA9911019574003321

Autore	Bloomfield Peter <1946->
Titolo	Fourier analysis of time series : an introduction / / Peter Bloomfield
Pubbl/distr/stampa	New York, : Wiley, c2000
ISBN	9786610541959 9781280541957 1280541954 9780471653998 0471653993 9780471722236 0471722235
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (285 p.)
Collana	Wiley series in probability and statistics. Applied probability and statistics section
Disciplina	515.2433 519.5/5 519.55
Soggetti	Time-series analysis Fourier analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"A Wiley-Interscience publication."
Nota di bibliografia	Includes bibliographical references (p. 247-254) and indexes.
Nota di contenuto	Contents; 1 Introduction; 1.1 Fourier Analysis; 1.2 Historical Development of Fourier Methods; 1.3 Why Use Trigonometric Functions?; 2 Fitting Sinusoids; 2.1 Curve-Fitting Approach; 2.2 Least Squares Fitting of Sinusoids; 2.3 Multiple Periodicities; 2.4 Orthogonality of Sinusoids; 2.5 Effect of Discrete Time: Aliasing; 2.6 Some Statistical Results; Appendix; 3 The Search for Periodicity; 3.1 Fitting the Frequency; 3.2 Fitting Multiple Frequencies; 3.3 Some More Statistical Results; Appendix; 4 Harmonic Analysis; 4.1 Fourier Frequencies; 4.2 Discrete Fourier Transform 4.3 Decomposing the Sum of Squares4.4 Special Functions; 4.5 Smooth Functions; 5 The Fast Fourier Transform; 5.1 Computational Cost of Fourier Transforms; 5.2 Two-Factor Case; 5.3 Application to Harmonic Analysis of Data; 6 Examples of Harmonic Analysis; 6.1 Variable Star Data; 6.2 Leakage Reduction by Data Windows; 6.3 Tapering the

Variable Star Data; 6.4 Wolf's Sunspot Numbers; 6.5 Nonsinusoidal Oscillations; 6.6 Amplitude and Phase Fluctuations; 6.7 Transformations; 6.8 Periodogram of a Noise Series; 6.9 Fisher's Test for Periodicity; Appendix; 7 Complex Demodulation; 7.1 Introduction
7.2 Smoothing: Linear Filtering7.3 Designing a Filter; 7.4 Least Squares Filter Design; 7.5 Demodulating the Sunspot Series; 7.6 Complex Time Series; 7.7 Sunspots: The Complex Series; Appendix; 8 The Spectrum; 8.1 Periodogram Analysis of Wheat Prices; 8.2 Analysis of Segments of a Series; 8.3 Smoothing the Periodogram; 8.4 Autocovariances and Spectrum Estimates; 8.5 Alternative Representations; 8.6 Choice of a Spectral Window; 8.7 Examples of Smoothing the Periodogram; 8.8 Reroughing the Spectrum; Appendix; 9 Some Stationary Time Series Theory; 9.1 Stationary Time Series
9.2 Continuous Spectra9.3 Time Averaging and Ensemble Averaging; 9.4 Periodogram and Continuous Spectra; 9.5 Approximate Mean and Variance; 9.6 Properties of Spectral Windows; 9.7 Aliasing and the Spectrum; 10 Analysis of Multiple Series; 10.1 Cross Periodogram; 10.2 Estimating the Cross Spectrum; 10.3 Theoretical Cross Spectrum; 10.4 Distribution of the Cross Periodogram; 10.5 Distribution of Estimated Cross Spectra; 10.6 Alignment; Appendix; 11 Further Topics; 11.1 Time Domain Analysis; 11.2 Spatial Series; 11.3 Multiple Series; 11.4 Higher Order Spectra
11.5 Nonquadratic Spectrum Estimates11.6 Incomplete and Irregular Data; References; Author Index; A; B; C; D; E; F; G; H; I; J; K; L; M; N; O; P; Q; R; S; T; U; V; W; Subject Index; A; B; C; D; E; F; G; H; I; J; L; M; N; O; P; Q; R; S; T; V; W

Sommario/riassunto

A new, revised edition of a yet unrivaled work on frequency domain analysis Long recognized for his unique focus on frequency domain methods for the analysis of time series data as well as for his applied, easy-to-understand approach, Peter Bloomfield brings his well-known 1976 work thoroughly up to date. With a minimum of mathematics and an engaging, highly rewarding style, Bloomfield provides in-depth discussions of harmonic regression, harmonic analysis, complex demodulation, and spectrum analysis. All methods are clearly illustrated using examples of specific data sets, while ampl