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	Descrizione fisica	1 online resource (XVII, 324 p. 202 illus., 167 illus. in color.)
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	Soggetti	Acoustical engineering Acoustics Signal processing Image processing Speech processing systems Engineering Acoustics Signal, Image and Speech Processing
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	Nota di bibliografia	Includes bibliographical references and index.
	Nota di contenuto	Signal dynamics as superpositions of sinusoidal waves in the time domain -- Sinusoidal waves as random variables -- Fourier transform and superposition of sinusoidal functions -- Differential equations for sinusoidal waves -- Discrete signals and linear systems -- Transfer functions and sequences in the time domain -- Signal dynamics for time and frequency domains -- Time and frequency responses of spherical source -- Wave equation and its general solution in the time domain.- Sound traveling in one-dimensional space -- Reverberation in rooms -- Signal dynamics and sound source distance.
	Sommario/riassunto	This book addresses the nature of sound, focusing on the characteristics of sound waves in the context of time structures. This time domain approach provides an informative and intuitively understandable description of various acoustic topics such as sound waves travelling in an acoustic tube or in other media where spectral or modal analysis can be intensively performed. Starting from the introductory topic of sinusoidal waves, it discusses the formal relationship between the time and frequency domains, summarizing the fundamental notions of Fourier or z-transformations and linear

systems theory, along with interesting examples from acoustical research. The books novel approach is of interest to research engineers and scientists In particular, the expressions concerning waveforms including the impulse responses are important for audio engineers who are familiar with digital signal analysis. Every chapter includes simple exercises designed to be solved without the need for a computer. Thus they help reconfirm the fundamental ideas and notions present in every chapter. The book is self-contained and concise, and requires only basic knowledge of acoustics and signal processing, making it valuable as a textbook for graduate and undergraduate university courses.