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Descrizione fisica	1 online resource (XIX, 380 p. 109 illus., 101 illus. in color.)
Collana	Mechanical Engineering Series, , 0941-5122
Disciplina	620.21
Soggetti	Acoustical engineering Signal processing Image processing Speech processing systems Acoustics Vibration Dynamics Electrical engineering Engineering Acoustics Signal, Image and Speech Processing Vibration, Dynamical Systems, Control Communications Engineering, Networks
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Analysis of acoustic signals -- One dimensional sound fields -- Sound Transmission Loss -- Analysis of mufflers and ducts -- Sound radiation in three dimensions -- Computer Aided Acoustics -- Modal Solutions for the Sound in Enclosures -- Geometrical Room Acoustics -- Effects of Viscosity -- Acoustic sensing -- Electronic transduction for acoustic sensors -- Estimation of capacitance -- Parameter identification of acoustic systems -- Appendix 1: The use of complex notation -- Appendix 2: Introduction to probability and random processes -- Appendix 3: The mean square response of a spring/mass/damper -- Appendix 4: Analysis of circuit noise -- Appendix 5: Some useful

formulas.

Sommario/riassunto

This textbook presents the fundamentals of engineering acoustics and examines in depth concepts within the domain that apply to reducing noise, measuring noise, and designing microphones and loudspeakers. The book particularly emphasizes the physical principles used in designing miniature microphones. These devices are used in billions of electronic products, most visibly, cell phones and hearing aids, and enable countless other applications. This is distinct from earlier books on this topic that take the view of the electrical engineer analyzing mechanical systems using electric circuit analogies. This text uses Newtonian mechanics as a more appropriate paradigm for analyzing these mechanical systems and in so doing provides a more direct method of modeling. Written at a level appropriate for upper-division undergraduate courses, and enhanced with end-of-chapter problems and MatLab routines, the book is ideal as a core text for students interested in engineering acoustics in ME, EE, and physics programs, as well as a reference for engineers and technicians working in the huge global industry of miniature microphone design. Maximizes reader understanding of methods for analyzing and designing acoustic sensors such as microphones; Describes methods for analyzing and characterizing sound levels; Introduces methods of analyzing sound in ducts and mufflers, techniques very important for noise control; Reinforces concepts presented with example designs, homework problems, and MatLab programs; Explains the principles behind the radiation of sound from complex systems.
