1.	Record Nr.	UNINA9910337603303321
	Autore	Rafaely Boaz <1964->
	Titolo	Fundamentals of Spherical Array Processing / / by Boaz Rafaely
	Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
	ISBN	3-319-99561-8
	Edizione	[2nd ed. 2019.]
	Descrizione fisica	1 online resource (201 pages)
	Collana	Springer Topics in Signal Processing, , 1866-2609 ; ; 16
	Disciplina	621.3822
	Soggetti	Signal processing
		Image processing
		Speech processing systems
		Acoustics
		Geophysics
		Acoustical engineering
		Signal, Image and Speech Processing
		Geophysics/Geodesy
		Engineering Acoustics
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	Mathematical background -- Acoustical Background.-Sampling the Sphere -- Spherical array configurations -- Spherical Array Beamforming -- Optimal beam pattern design -- Beamforming with noise minimization.
	Sommario/riassunto	This book provides a comprehensive introduction to the theory and practice of spherical microphone arrays, and was written for graduate students, researchers and engineers who work with spherical microphone arrays in a wide range of applications. The new edition includes additions and modifications, and references supplementary Matlab code to provide the reader with a straightforward start for own implementations. The book is also accompanied by a Matlab manual, which explains how to implement the examples and simulations presented in the book. The first two chapters provide the reader with the necessary mathematical and physical background, including an

introduction to the spherical Fourier transform and the formulation of plane-wave sound fields in the spherical harmonic domain. In turn, the third chapter covers the theory of spatial sampling, employed when selecting the positions of microphones to sample sound pressure functions in space. Subsequent chapters highlight various spherical array configurations, including the popular rigid-sphere-based configuration. Beamforming (spatial filtering) in the spherical harmonics domain, including axis-symmetric beamforming, and the performance measures of directivity index and white noise gain are introduced, and a range of optimal beamformers for spherical arrays, including those that achieve maximum directivity and maximum robustness are developed, along with the Dolph–Chebyshev beamformer. The final chapter discusses more advanced beamformers, such as MVDR (minimum variance distortionless response) and LCMV (linearly constrained minimum variance) types, which are tailored to the measured sound field.