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	Titolo	Applied Fourier Analysis [[electronic resource]] : From Signal Processing to Medical Imaging / / by Tim Olson
	Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Birkhäuser, , 2017
	ISBN	1-4939-7393-2
	Edizione	[1st ed. 2017.]
	Descrizione fisica	1 online resource (XVI, 302 p. 126 illus., 118 illus. in color.)
	Disciplina	515.2433
	Soggetti	Fourier analysis
		Signal processing
		Image processing
		Speech processing systems
		Partial differential equations
		Applied mathematics
		Engineering mathematics
		Fourier Analysis
		Signal, Image and Speech Processing
		Partial Differential Equations
		Applications of Mathematics
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di bibliografia	Includes bibliographical references and index.
	Nota di contenuto	Introduction: From Linear Algebra to Linear Analysis -- Basic Fourier Series -- The Discrete Fourier Transform -- The Fourier Transform -- Sampling and Interpolation -- Digital Communications -- Radar Processing -- Image Processing -- Medical Imaging -- Partial Differential Equations.
	Sommario/riassunto	The first of its kind, this focused textbook serves as a self-contained resource for teaching from scratch the fundamental mathematics of Fourier analysis and illustrating some of its most current, interesting applications, including medical imaging and radar processing. Developed by the author from extensive classroom teaching experience, it provides a breadth of theory that allows students to appreciate the utility of the subject, but at as accessible a depth as

possible. With myriad applications included, this book can be adapted to a one or two semester course in Fourier Analysis or serve as the basis for independent study. Applied Fourier Analysis assumes no prior knowledge of analysis from its readers, and begins by making the transition from linear algebra to functional analysis. It goes on to cover basic Fourier series and Fourier transforms before delving into applications in sampling and interpolation theory, digital communications, radar processing, medical i maging, and heat and wave equations. For all applications, ample practice exercises are given throughout, with collections of more in-depth problems built up into exploratory chapter projects.   The content of the book itself is limited to what students will need to deal with in these fields, and avoids spending undue time studying proofs or building toward more abstract concepts. The book is perhaps best suited for courses aimed at upper division undergraduates and early graduates in mathematics, electrical engineering, mechanical engineering, computer science, physics, and other natural sciences, but in general it is a highly valuable resource for introducing a broad range of students to Fourier analysis.