

1. Record Nr.	UNINA9910338253503321
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Titolo	Linear Algebra, Signal Processing, and Wavelets - A Unified Approach : Python Version // by Øyvind Ryan
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
ISBN	3-030-02940-9
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (XXVII, 364 p. 103 illus., 29 illus. in color.)
Collana	Springer Undergraduate Texts in Mathematics and Technology, , 1867-5506
Disciplina	512.5
Soggetti	Algebras, Linear Computer mathematics Applied mathematics Engineering mathematics Signal processing Image processing Speech processing systems Fourier analysis Linear Algebra Computational Science and Engineering Mathematical and Computational Engineering Signal, Image and Speech Processing Fourier Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	1. Sound and Fourier series -- 2. Digital Sound and Discrete Fourier Analysis -- 3. Discrete Time Filters -- 4. Motivation for Wavelets and Some Simple Examples -- 5. The Filter Representation of Wavelets -- 6. Constructing Interesting Wavelets -- 7. The Polyphase Representation of Filter Bank Transforms -- 8. Digital Images -- 9. Using Tensor Products to Apply Wavelets to Images -- A Basic Linear Algebra.
Sommario/riassunto	This book offers a user friendly, hands-on, and systematic introduction to applied and computational harmonic analysis: to Fourier analysis,

signal processing and wavelets; and to their interplay and applications. The approach is novel, and the book can be used in undergraduate courses, for example, following a first course in linear algebra, but is also suitable for use in graduate level courses. The book will benefit anyone with a basic background in linear algebra. It defines fundamental concepts in signal processing and wavelet theory, assuming only a familiarity with elementary linear algebra. No background in signal processing is needed. Additionally, the book demonstrates in detail why linear algebra is often the best way to go. Those with only a signal processing background are also introduced to the world of linear algebra, although a full course is recommended. The book comes in two versions: one based on MATLAB, and one on Python, demonstrating the feasibility and applications of both approaches. Most of the code is available interactively. The applications mainly involve sound and images. The book also includes a rich set of exercises, many of which are of a computational nature.
