



Oscillating Patterns in Image Processing and Nonlinear Evolution Equations: The Fifteenth Dean Jacqueline B. Lewis Memorial Lectures (Paperback)

By Yves Meyer

American Mathematical Society, United States, 2001. Paperback. Condition: New. Language: English . Brand New Book. Image compression, the Navier-Stokes equations, and detection of gravitational waves are three seemingly unrelated scientific problems that, remarkably, can be studied from one perspective. The notion that unifies the three problems is that of oscillating patterns, which are present in many natural images, help to explain nonlinear equations, and are pivotal in studying chirps and frequency-modulated signals. The first chapter of this book considers image processing, more precisely algorithms of image compression and denoising. This research is motivated in particular by the new standard for compression of still images known as JPEG-2000. The second chapter has new results on the Navier-Stokes and other nonlinear evolution equations. Frequency-modulated signals and their use in the detection of gravitational waves are covered in the final chapter. In the book, the author describes both what the oscillating patterns are and the mathematics necessary for their analysis. It turns out that this mathematics involves new properties of various Besov-type function spaces and leads to many deep results, including new generalizations of famous Gagliardo-Nirenberg and Poincaré inequalities. This book is based on the Dean Jacqueline B. Lewis Memorial Lectures given by...



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