



# Time Frequency Analysis: Theory and Applications

By Leon Cohen

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## Time Frequency Analysis: Theory and Applications By Leon Cohen

Featuring traditional coverage as well as new research results that, until now, have been scattered throughout the professional literature, this book brings together—in simple language—the basic ideas and methods that have been developed to study natural and man-made signals whose frequency content changes with time—e.g., speech, sonar and radar, optical images, mechanical vibrations, acoustic signals, biological/biomedical and geophysical signals. Covers time analysis, frequency analysis, and scale analysis; time-bandwidth relations; instantaneous frequency; densities and local quantities; the short time Fourier Transform; time-frequency analysis; the Wigner representation; time-frequency representations; computation methods; the synthesis problem; spatial-spatial/frequency representations; time-scale representations; operators; general joint representations; stochastic signals; and higher order time-frequency distributions. Illustrates each concept with examples and shows how the methods have been extended to other variables, such as scale. For engineers, acoustic scientists, medical scientists and developers, mathematicians, physicists, and managers working in the fields of acoustics, sonar, radar, image processing, biomedical devices, communication.

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## **Editorial Review**

From the Back Cover

This book brings together the methods that have been developed to study time-varying spectra and presents in simple language the physical and mathematical ideas, their origin and motivation, and the challenges of the field.

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