

S+Wavelets[®]



One of the most exciting recent developments in applied mathematics is now available for widespread application. With S+Wavelets, you can apply wavelet analysis to an extremely broad range of problems involving signal, time series, or image data.

Now there's a comprehensive, modern approach to advanced signal and image analysis, time series analysis, statistical signal estimation, and data compression analysis. The S+Wavelets toolkit provides a powerful new set of analysis tools, created specifically for scientific and technical data. Working together with S-PLUS analysis software, S+Wavelets goes well beyond the capabilities of the Fourier transform for many kinds of signals and images.

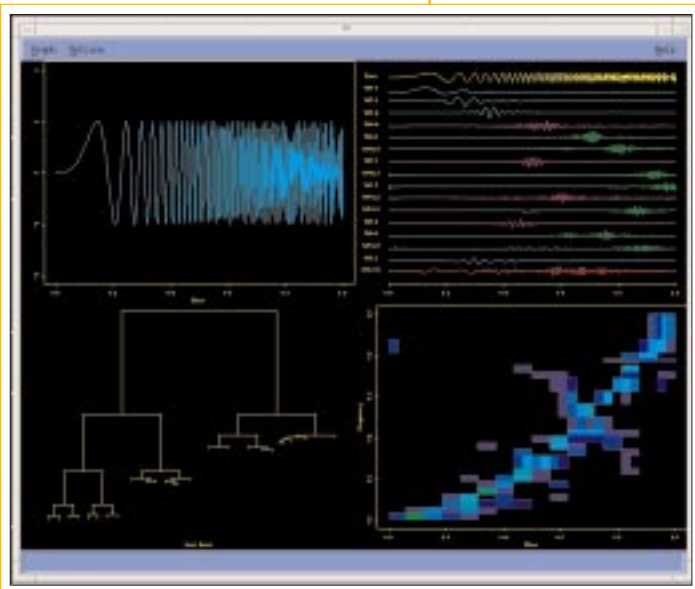
S+Wavelets can be used for many applications, including signal processing, medical imaging, time series analysis, pattern recognition, non-linear signal estimation, and data compressions. S+Wavelets helps you develop a complete understanding of data using time-frequency displays, multi-resolution analysis, automatic signal estimation/extraction and denoising, and a compre-

hensive set of exploratory data analysis plots for wavelets decompositions.

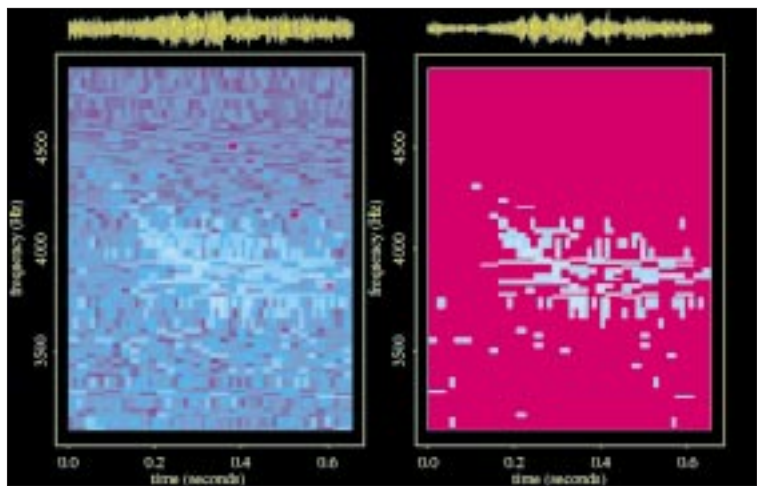
The complete S+Wavelets toolkit includes an extensive set of over 500 analysis functions within an object-oriented environment, including the discrete wavelets transform, wavelet optimal signal estimation, wavelet packet analysis, local cosine analysis, "best basis" selection, matching pursuit analysis, robust wavelets analysis and more.

S+Wavelets operates in conjunction with S-PLUS, the most powerful data analysis software available today. S-PLUS is based on the object-oriented S language developed at Lucent Technologies specifically for analyzing scientific and technical data. S-PLUS contains a rich set of analysis, visualization, and modeling tools, including robust methods.

When you combine S+Wavelets with S-PLUS, you'll have the complete control and freedom you need to develop a thorough, penetrating analysis of your signal, time series or image data.



This screen demonstrates the best wavelet packet analysis of a quadratic chirp signal. The quadratic chirp is in the upper left and wavelet packet quadratic chirp signal components are in the upper right. A best basis selection tree is in the lower left window. The time-frequency plot in the lower right clearly indicates that frequency increases quadratically over time.



The acoustic signal of a porpoise chirp and background noise is displayed in the left panel. The de-noised signal, obtained using a wavelet packet transform, is displayed in the right panel. Plotted below the signals are their time-frequency representations. The time-frequency display gives an estimate of the local frequency content of a signal at a given point in time. The porpoise chirp, mostly obscured by background noise in the original signal, stands out clearly in the de-noised time-frequency display.

Features

- Discrete wavelets transform
- Wide choice of wavelet basis functions
- Multi-resolution decomposition and analysis
- Non-decimated wavelet transforms
- Time-frequency graphical displays
- Optimum nonlinear extraction of non-smooth signals from noise
- Robust wavelets analysis
- Wavelet packet analysis
- Best-basis adaptive choice of transform
- Matching pursuit decompositions
- 1D and 2D data support with arbitrary sample sizes
- Full range of boundary correction methods appropriate for your data

System Requirements

Windows System Requirements

- S+Wavelets requires the S-PLUS data analysis package version 2000 or later for operation.
- Pentium processor with 96MB of memory running Microsoft Windows NT, ME, 95, 98, 2000.

UNIX/Linux System Requirements

- S+Wavelets requires the S-PLUS data analysis package version 5.1 or later for operation.
- Sun Solaris 2.6 or later on SPARC 32-bit architecture, Sun Solaris 2.7 or later on SPARC 64-bit architecture, SGI IRIX 6.5 or later, Compaq Alpha running Tru64 UNIX 4.0F or later, HP-UX 11.0 or later, Red Hat Linux 6.1 or later or SuSE Linux 6.4 or later.



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