SIGNAL™ 5
digital signal analysis system

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What's New in SIGNAL™ 5

Details

Here are details of new SIGNAL 5 features...

Data acquisition & playback
- Advanced acqusition & playback thru Data Translation, National Instruments and Windows sound cards
- Programmable I/O tasks for repetition, stimulus variation, timing and scheduling
- Simultaneous acquisition and playback in SIGNAL using **Experiment Maker** add-on
- Microsecond timing, triggering and waveform generation using **Experiment Maker** add-on

Sound and text file I/O
- Support for 8-, 16- and 24-bit sound files with any number of channels
- Normalize or scale sound amplitude to optimize sound file storage
- Specify voltage level of Wave files for absolute level measurement
- Join multiple sound files and append to existing ones
- Open unlimited number of text data files for input and output
- Read and write binary data files at byte level for compatibility with any external system

Analysis
- Spectrogram editing including spike suppression and noise removal and reconversion to time signal
- Spectrogram lasso for precision spectrogram editing
- Automatic smoothing for power spectra

Synthesis
- Gaussian random signal generator, for noise synthesis and statistical stimulus selection

Graphics
- High-resolution 256-color and grey level spectrograms
- Display power spectra on linear and log frequency axes
- Playback wiper shows on-screen signal location live during playback
- Save SIGNAL graph window as bitmap (BMP) image file with specified dimensions

- Multi-page streaming spectrograms of unlimited-size files, stored automatically as image files
- Overlay multiple time and spectrogram signals "transparently" with multi-color display
- Cursor readout of spectrogram cell amplitude for 3D contour analysis
- Add markers at precise (x,y) graph locations for annotation

SIGNAL / RTS integration
- SIGNAL graphs can be displayed in a SIGNAL measurement window or a scrolling RTS window
- RTS can export data to SIGNAL for extended parameter measurement
- SIGNAL can display sounds in an unlimited number of RTS windows for comparison and flexibility

TUTOR
- 30-chapter interactive learning program teaches all major SIGNAL functionalities by example
- Coverage includes
    - Basic SIGNAL tools such as sound acquisition, editing and display
    - Bioacoustic analysis such as sound sampling, Fourier transforms and frequency resolution
    - Advanced bioacoustic research such as sound similarity, synthesis and frequency contour analysis

Usability
- Main SIGNAL window size and location is remembered between sessions
- Launch multiple simultaneous SIGNAL sessions for separate or comparative analyses
- Create a "favorites" list of user-written macros and assign to function keys for quick access

GUI toolkit for user written programs
- Message boxes, radio buttons, drop menus, edit boxes, directory browser for user-written programs
- Message boxes allow embedded user images and nested title bars for navigation
- BACK and NEXT buttons support forward and backward navigation within a program

Other programming
- Detect currently displayed signal ID for use by user programs
- IF / ELSEIF / ENDIF logical construct

RTS^{tm}
- Playback through Data Translation, National Instruments and Windows sound cards
- Playback wiper shows on-screen signal location live during playback
- Drag-highlight signal segments for quick zoom, editing, measurement and export

Experiment Maker^{tm}
- Add-on module turns SIGNAL into a programmable, automated, experiment control system
    - Record and present acoustic signals in real-time
    - Precisely time experimental events
    - Interact with human and animal subjects through digital switches and lights
    - Synchronize with other systems through digital control signals
- Applications
    - Simultaneous acquisition and playback
    - Precisely timed repetitive playbacks
    - Adaptive playbacks
    - Dynamic stimulus selection
    - Reaction time measurement
    - Automatic event counting
    - Real-time frequency measurement
    - Trigger and pulse train generation
    - Integrated acoustic and visual testing

Future SIGNAL/RTS features under consideration
- Real-time acquisition and playback in RTS with synchronized live scrolling display
- Hardcopy graphics output in SIGNAL, including multi-page spectrogram hardcopy via STRIP
- PLAYKEY command for keyboard-based "interactive" playback

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