



Russia,  
St. Petersburg

# Speech Technology Center

## IKAR LAB

**Professional hardware and software set for advanced audio/speech signal analysis**

### IKAR LAB

- SIS - Speech Interactive Software
- STC professional sound card with an external unit
- Set of manuals

### Additional Options

- Sound Cleaner Premium - universal real time speech enhancement, premium edition
- Caesar - transcription software

### Training

STC experts provide basic and advanced training in speech enhancement, audio analysis, speaker identification, and other forensic audio subjects. Consultancy and training can be tailored to customer needs.

IKAR Lab is provided both with user guides and manuals which include theory and practical advice with up-to-date sound analysis methodologies, included are:

- ◆ SIS: Practical Usage
- ◆ Noise cancellation and decoding of noisy recordings
- ◆ Forensic Audio Examinations: Practice and methods

### Professional sound card

In order to ensure professional standards in sound quality, maximal signal/ noise ratio and minimal non-linear distortions, IKAR Lab is equipped with STC sound card.

### Software Components

#### SIS 5.x

SIS 5.x - Speech Interactive Software  
- professional system for speech and audio signal analysis & processing

- ◆ contains comprehensive set of numerous speech editing/ processing/ analysis/ visualization methods and tools
- ◆ includes multi-task set of tools for forensic audio examinations: speaker identification by voice, tape and equipment authentication, etc.
- ◆ provides voice enhancement, noise cancellation, efficient text decoding of noise corrupted speech recordings, audio equipment testing and other procedures
- ◆ is used by speech & audio specialists, forensic audio experts and speech equipment developers

#### Caesar

Caesar- transcription software

- ◆ high quality recording & playback
- ◆ effective and fast text decoding of recorded & live audio with automatic links between the text & the corresponding audio fragment
- ◆ variable playback speed without voice / speech quality losses
- ◆ user-friendly, especially for non-professionals

#### Sound Cleaner

Sound Cleaner - universal software  
for real time noise cancellation and speech enhancement

- ◆ provides professionals and non-technical users with user friendly, comprehensive and specialized environment
- ◆ improves speech quality, intelligibility & operator comfort while listening to noisy live or pre-recorded audio
- ◆ is effective against a wide variety of noise: background bubble, office equipment, industrial and vehicle engines, street traffic, wind, slow music, power supply hum, noise of communication channels, pulse-like interferences, etc.
- ◆ contains 9 automatic & semi-automatic self-adjusting filters, including a unique set of 4 stereo filters and dynamic processing
- ◆ provides set of standard settings to filter most types of noise
- ◆ includes 8,192-bands graphical equalizer with 2,048 sliders, classical and brand-new adaptive filtering engines, as well as many additional procedures to support comfortable work of the user.

***SIS Speech Interactive Software is described in detail on the following pages. There are detailed descriptions of Caesar and Sound Cleaner in the corresponding leaflets.***

## Speech Technology Center

Office: 4, Krasnitskogo str.  
196084, St. Petersburg, Russia

Tel.: +7 812 325 8848  
Fax: +7 812 327 9297

Email: [sales@speechpro.com](mailto:sales@speechpro.com)  
<http://www.speechpro.com>

Postal address: P.O. Box 114,  
Lappeenranta SF-53101, Finland

## Applications

- ◆ Excellent tool for forensic sound recordings examinations:
  - text decoding,
  - noise cancellation,
  - speaker identification,
  - audio equipment and tape authentication, etc.
- ◆ Audio signal editing/ processing/ analysis/ visualization
- ◆ Audio equipment testing
- ◆ Scientific research in speech & audio sciences and acoustics
- ◆ Audio signal measurement
- ◆ Medical research in speech & hearing
- ◆ Sound/ music research and education
- ◆ Speech recognition, compression and synthesis methods development
- ◆ Old recordings restoration etc.

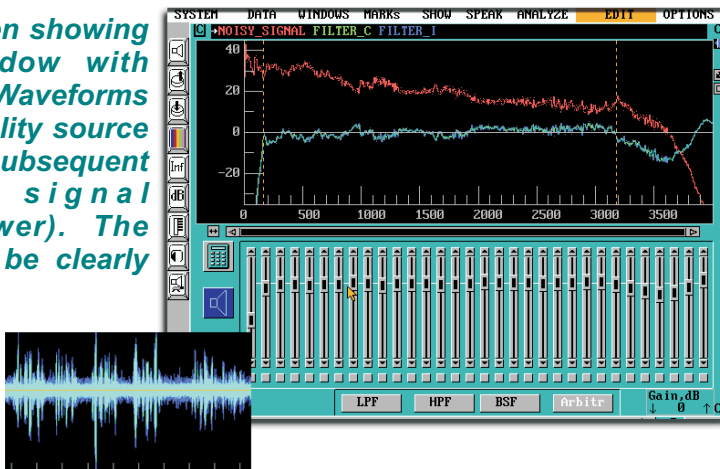
## Advantages

- ◆ **Unique powerful environment for noisy speech signal processing**
- ◆ **Sophisticated speech signal analysis**
- ◆ **Superpowerful signal editor SIS 5.x**
- ◆ Speech enhancement and noise cancellation in real time
- ◆ Fast decoding of speech recording text
- ◆ Improvement in speech quality, intelligibility and operator comfort while listening to noisy sound-recordings
- ◆ Effective both for professionals and for non-technical users
- ◆ Many years of successful usage in universities, clinics and in forensic, law enforcement and security agencies
- ◆ User training and consulting

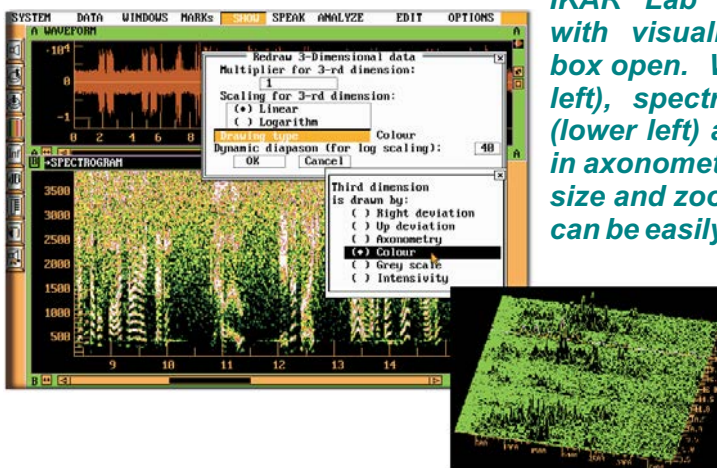
## Advantages

- ◆ Pop-up menus
- ◆ Mouse operations
- ◆ Up to 253 working windows with as many audio signals as you need
- ◆ Save configuration
- ◆ Listen, mark, label, scroll, jump, mix, paste, edit with a single mouse-click
- ◆ Several types of zoom
- ◆ Axes re-scaling for any picture characteristics
- ◆ Annotate, transcript, link, save and load audio signal any duration within 180Mb of virtual memory
- ◆ Vertical and horizontal cursors
- ◆ Temporary & permanent marks
- ◆ 5 types of data selection
- ◆ Unique ability to convert barely perceptible signal features in spectral, cepstral or other areas into distinctly visible traits in 3D-pictures
- ◆ Linking of signals of various sizes, types, dimensions and sampling rates
- ◆ 6 types of 3D representation of visible speech pictures
- ◆ Interactive design for any 3D-pictures
- ◆ Audible, numerical & graphical direct comparing of all instantaneous and accumulated speech features
- ◆ Interfacing with programs for additional signal processing

*IKAR Lab screen showing equalizer window with inverse filter. Waveforms of the poor quality source signal and the subsequent processed signal equalizer (lower). The difference can be clearly seen*



*IKAR Lab working screen with visualization dialogue box open. Waveform (upper left), spectrogram in color (lower left) and spectrogram in axonometry (below). Type, size and zoom of any picture can be easily adjusted.*



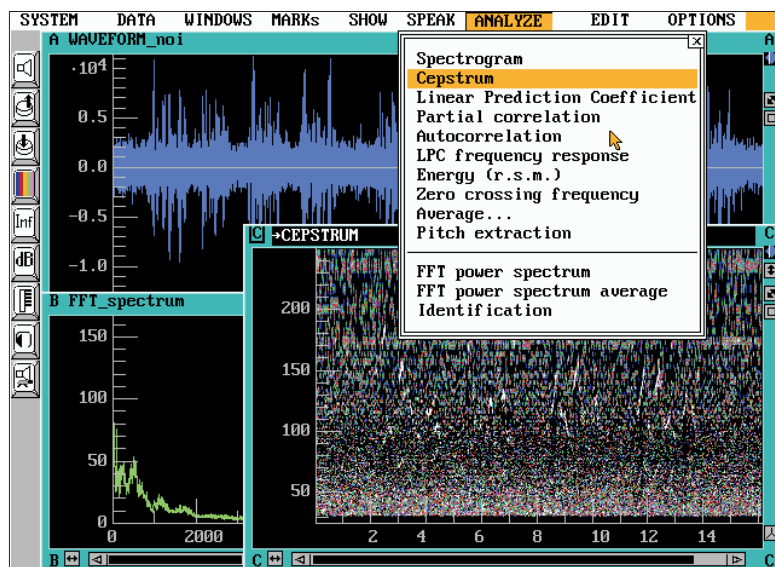
**EASIER AND  
FASTER  
PROFESSIONAL  
WORK**

## Features

- ◆ Linear transformations
- ◆ Normalization
- ◆ Clipping
- ◆ Pauses zeroing
- ◆ Arbitrary mu-transformation in real time
- ◆ Variable speed speech playback without voice pitch and signal quality losses
- ◆ Linear arbitrary FIR filtering (low-pass, high-pass, band-stop)
- ◆ Digital precise 2,048 bands graphical mouse-operated equalizer
- ◆ Linear adaptive mono and stereo filtering
- ◆ Manual and automatic pulse-like interference removal
- ◆ Dynamic filtering
- ◆ Wideband noise reduction by means of spectral subtraction
- ◆ Automatic spectral inverse filtering
- ◆ Waveform, power spectrum and cepstrum, LPC-spectrum, autocorrelation, PARCOR, LPC, formants, energy, zero crossing frequency, stable spectrum and other types of analysis
- ◆ Pitch analysis: 6 different methods
- ◆ Unique method for checking correctness of pitch computation by overlay over cepstrogram
- ◆ Detailed pitch curves statistics
  - 28-features of curve and histogram
  - max, min, mean and median values
  - moments, factors of raise
  - stability and decrease
  - 8 jitter and tremor factors, etc.
- ◆ Manual signal editing/ drawing

**ALL-IN-ONE  
FOR THE  
PROFESSIONAL**

*IKAR Lab working screen with analysis menu open. Each type of analysis includes several methods and allows fine adjustment of its settings and visualization.*



IKAR Lab has been used for forensic examinations and speech enhancement in the majority of law enforcement departments in Russia as well as in some other countries. It has also been used in security services of many banks and businesses, in research, medical and educational institutions. Over a long period of its existence and development this system has absorbed all the best practically useful adjustments in speech research area.

*IKAR Lab working screen with filtration menu open. In the upper window you can see two waveforms - darker blue one of the noisy signal, and lighter green one of the filtered signal. In the lower window there are FFT spectra of the source (upper red line) and the processed (lower pink line) signals.*

