Speech Technology Center

Voice of the Future

Developers' Solutions

NOISE CANCELLATION

SPEAKER VERIFICATION

VOICE COMMAND RECOGNITION

Speech Technology Center Limited (STC) is active in the following areas: speech processing and enhancement, voice recognition, speaker verification, noise filtering, audio signal analysis, logging, monitoring, music and keyword searching in a sound stream.

STC develops, manufactures and markets software and hardware solutions, standalone devices, DSP boards and software toolkits.

Founded in 1990, STC has an excellent reputation in the high-tech market, designing algorithms for high performance speech processing applications. STC provides end-user solutions as well as SDK for PC and DSP platforms.
STC's scientific team focuses on developing unique know-how in the field of speech/signal technology. All STC products are based on proprietary patented technologies.

The software libraries and DSP solutions developed by Speech Technology Center are mostly used in such industries as:

- Telecommunications
- Business software applications
- Multimedia software
- Home appliances
- Mobile accessories
- Medical equipment

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All the software and hardware modules are offered by STC for licensing. STC software and hardware modules are easily integrated into customer's products. All software development kits include:

- 32 bit DLL
- API
- User's manual
- Demo software with the code examples.

All the hardware modules are based either on TI C54xx DSP, or hyperstone E1-16, 32.

Customers can easily combine STC products for a complete solution. Customization, engineering and consultancy services are also available. Technical support during the development stage is provided.

NOISE CANCELLATION

Denoiser Clear Voice SDK (Software Development Kit)

Denoiser Clear Voice SDK is multifunctional, real-time, noise suppression software designed to remove noise and improve speech clarity.

- **Voice recognition**: Substantial reduction in noise and improvement of voice quality.
- **Teleconferencing solutions and IP telephony**: Enhanced speech quality and superior compression on VoIP.
- **Sound processing software for Broadcasting and music restoration:** Improvement of sound quality in poor speech and music recordings.

- Adaptively removes background noise in real-time.
- Adjustable noise filtering parameters.
- Overall Signal-Noise-Ratio (SNR) improvement: up to 30dB.
- Tonal noise suppression: up to 50dB.
- Broadband noise suppression: up to 15dB.
- Effective against the following noise sources: AC, office equipment and fans, industrial and vehicle engines, street traffic, wind, slowly varying music, power supply hum, etc..

Denoiser is also available as an **ActiveX control**: this provides easier and rapid integration into any application, includes examples of web application.

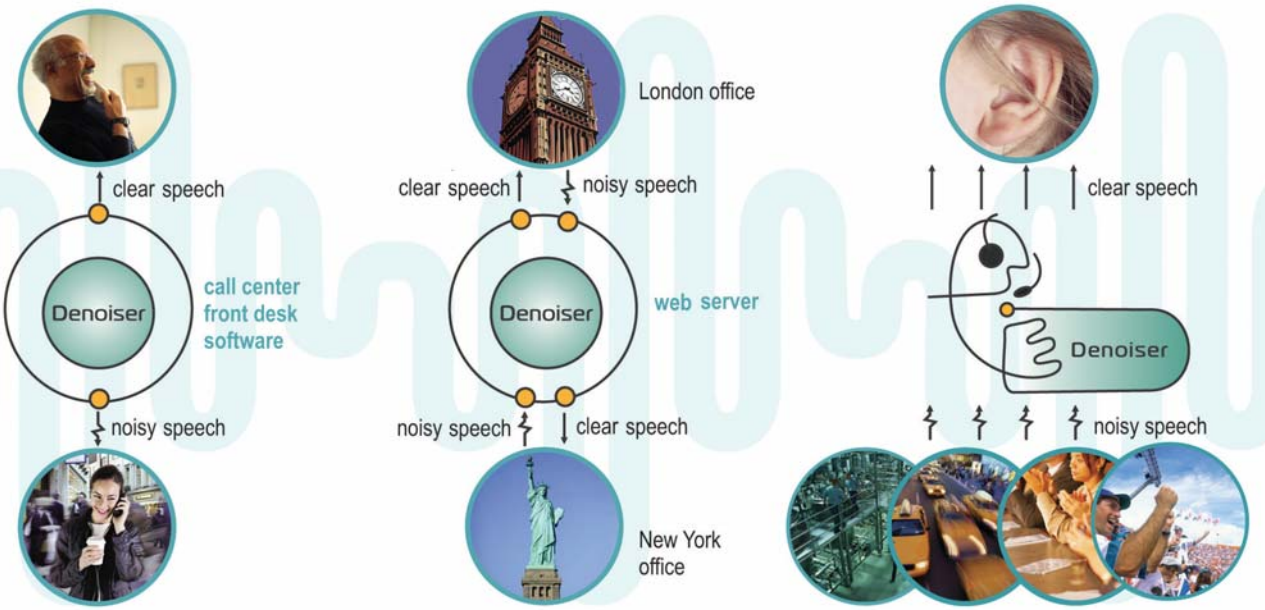
Denoiser DSP board

Hardware module with automatic speech enhancement for:

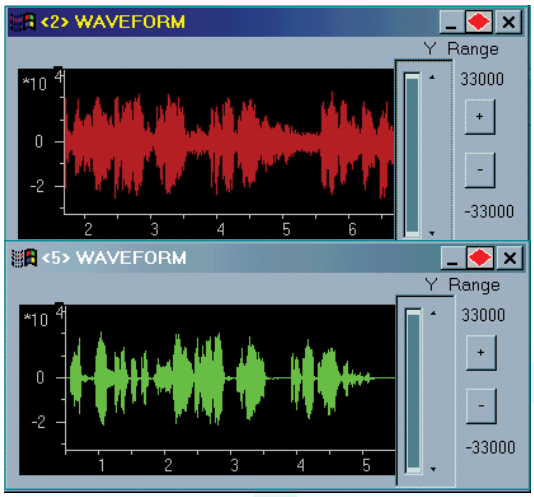
- Intercoms, mobile phones, hands-free kits, speakerphones, two-way radios.
- Telephony equipment: answering machines.
- Sound processing equipment for broadcasting.
- Voice recognition devices and dictation equipment.
- Sound recorders.
- Call-center equipment.
- Any communication device operating in noisy environments such as aircraft cabins, construction sites, factories.

- Real-time signal processing, high speed and stability of algorithm performance.
- High quality of processed speech.
- Commonly used interfaces supported.
- Available for TI TMS C54 and Hyperstone E1-16,32.
- Low cost of integration and further production.
- Small physical size 50mm x 40mm; customizable upon request.

TI eXpressDSP compliant Denoiser algorithm is available for licensing.



NOISE CANCELLATION



Declicker Clear Voice SDK

Automatic real-time removal of pulse-like interference (clicks, pops, cracks, etc.) for:

- **Telecommunications:** Speech quality improvement for telephone, satellite and radio channels.
- **Broadcasting:** Quality enhancement for radio transmissions and audio data.
- **Music restoration and CD mastering:** Audio signal improvement for vinyl LPs and DAT recordings.
- **Multimedia software**: Enhanced sound quality.

- Effective against pulse-like and spike-like distortions of LP recordings, digital clicks and static discharge cracks of DAT masters, impulse noise in communication channels.
- Adjustable noise filtering parameters.

Denoiser-by-Reference Clear Voice SDK

Significant improvement in music and sound recordings' quality, using noise pattern reference for:

- **Sound processing software for Broadcasting and Music restoration:** Accurate and gentle enhancement of sound quality for poor speech and music recordings, particularly effective on old recordings.
- **Multimedia software**: Music and sound quality improvement.

- Adjustable noise filtering parameters.
- Effective against various distortions found on most old recording media.

eXpressDSP™ Compliant
DSP
TEXAS INSTRUMENTS

Sound Stretcher SDK - Variable Speed Speech Playback

Sound Stretcher SDK allows playback of speech in variable fast or slow speed without distorting voice pitch, so that speech still sounds natural. This gives the listener a chance to alter the speed and have complete understanding of the content for analysis purposes. It is an algorithm of real time speech modification for:

- **Multimedia and Broadcasting:** More efficient use of advertisement airtime.
- **Transcription of speech:** The possibility to slow down speech rate and still hear coherent sentences enables the user to perform the task quicker and easier.
- **Educational software** for studying foreign languages: Better understanding of foreign languages encouraging the learning process.

- Up to 3 times faster or slower speech playback speed.
- Speed can be changed without voice pitch distortions.
- Language-independent. Sound Stretcher can be used for any language regardless of the user's accent.
- Smooth acceleration/slow-down rate adjustment.

VOICE COMMAND RECOGNITION

VoiceCom SDK

Voice command control for:

- **Education:** Using voice commands makes the learning process more enjoyable for both children and adults.
- **Notebooks & PDAs:** Giving voice commands is easier than using a cumbersome mouse and a small keyboard.
- **Industrial applications:** Where a person's hands need to be free for other tasks.
- **Applications for people with physical difficulties.**

- Language-independent.
- Few requirements for microphone quality and placement location.
- Low resource consumption: The technology can be embedded in any resource-limited device (mobile equipment, PDAs, etc).
- Noise robust: Voice recognition is combined with Denoiser Clear Voice, powerful noise filtering technology, in order to get the best recognition performance in noisy environments.

Voice Navigator: Voice Control of PC Programs

Voice Navigator is a fun application based on VoiceCom software library that helps you control your computer using the power of your own voice. Use your PC "hands free" without having to use your keyboard or mouse for up to 200 commands. Voice Navigator can be used by people of all ages in a variety of situations.

You can:

- Easily open any Windows application, file, and folders purely by voice commands.
- Link quickly by voice to your favorite web pages.
- "Press" frequently used hot keys by voice.
- Noise Robust: Voice Navigator gives good voice recognition even in a noisy environment.
- Not dependent on any particular language or specific words.

DiVo – Voice command recognition DSP board

Voice command recognition on a single DSP board to control by voice applications such as:

Industrial equipment: Voice control raises the efficiency of machines operation.

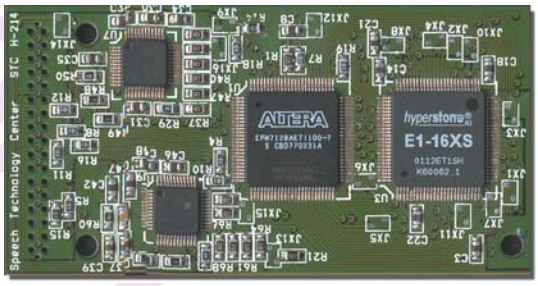
Home appliances: Remote control by voice

- **Car equipment**: Drive safely talking to navigation and other on-board systems.
- **Electronic toys**: kids will enjoy speaking to their favorite toys.

Car Hands-free kits with such features as:

- Fully voice-controlled interface with voice responses.
- Voice dialing.
- Voice phonebook.
- Powerful filtering of car noise.
- Far-end echo cancellation, full duplex.

DiVo is available for TI TMS C54xx, Hyperstone E1-16, 32 platforms.



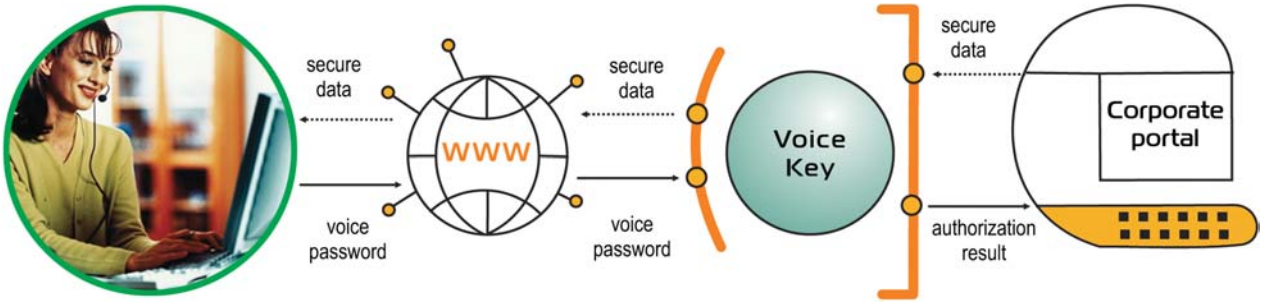
SPEAKER VERIFICATION

Voice Key SDK

Biometric secure speaker verification/authentication technology. Voice Key verifies a user by a voice password. Cost effective access restriction for:

- **Web-based applications:** Small size of the engine allows much more reliable client side verification.
- **PDAs:** Faster and easier to input a voice password than type it on the small inconvenient keyboard.
- **On-line information services:** User doesn't need to remember long alphabetic passwords, using a natural language pass phrase instead.

- Voice Key SDK can be easily combined with other security technologies, including biometrics.
- Only an authorized person says the password in exactly the right way.
- Voice password cannot be stolen or imitated by a possible intruder.
- Language-independent.
- Safe, reliable and secure voice verification technology with Minimal False Acceptance Rate FAR=0.01 %; Minimal False Rejection Rate FRR= 0.28%; Equal Error Rate EER=1.2%.
- Very noise robust. STC speaker verification technology is based on voice features different from those used by its competitors.

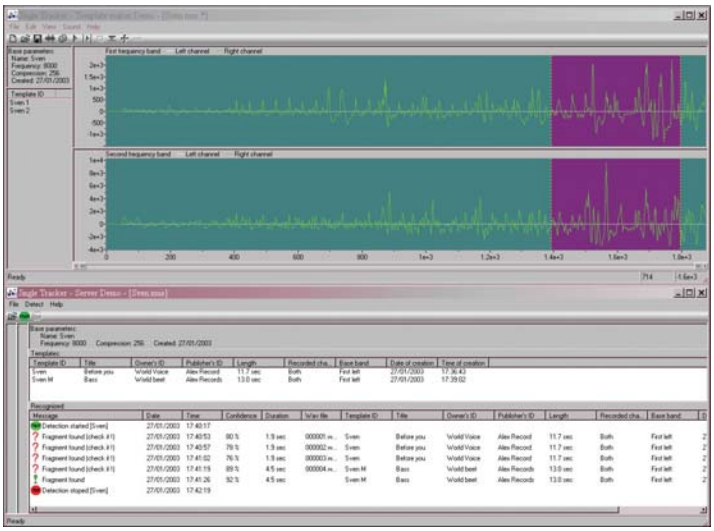


MUSIC SPOTTING

Music Spotting SDK

Real-time identifying of music samples in a sound stream for:

- **Advertising Agencies**: Checking how many times and when exactly a promotion jingle plays back on a number of broadcasting channels.
- **Broadcasting & Music Copyright Organizations:** Checking how many times and when exactly a music piece plays back on a number of broadcasting channels.



- Music Spotting creates music sample templates, puts them into a database and then searches the inputted sound stream and logs the occurrence of the same music samples.
- Real-time processing.
- Low resource consumption. Can be used on common personal computers (PC).
- Easy adaptation to any specific application. Depending on the application, speed and false acceptance/false rejection balance can be adjusted.
- High accuracy and recognition stability with different kinds of music and jingles.

Speech Technology Center

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