

3D Audio Solutions

Software-Based 3D Audio Technology
for Fast Hardware Implementation



socionext™
for better quality of experience

A Lifelike, Immersive Experience



The revolutionary Socionext 3D audio software creates lifelike surround sound without needing expensive audio equipment.

The immersive “close-to-the-ear” effect enhances the experience and effectiveness of a variety of end products.

This technology can be integrated into applications ranging from smart phones, gaming devices and TV sets to digital signage and in-vehicle infotainment systems.

The software can even be added to existing products without requiring hardware modifications or expensive speakers.

The technology has an extensive track record in the entertainment industry, where it has been used in leading gaming devices for years.

How Does it Work?



Example: Two Speakers

- Sounds you want the left ear to hear
- Sounds you don't want the right ear to hear
- Cancelling sounds you don't want the right ear to hear

The Socionext audio solutions make full use of spatial-acoustics technology. The end product only needs to process a sound object into a 3D sound object. The authoring tool processes that sound object off-line to develop the 3D surround-sound effects.

The acoustic software requires no hardware modifications, dedicated speakers or Digital Signal Processor (DSP). The authoring tool can be tuned to meet the needs of specific products, including individual vehicle models.

Setting-up the 3D Audio Demo

To hear the difference for yourself, please contact our solution expert at sna_inquiry@us.socionext.com to access sample audio files.

Position of hearing: 25" to 30" from the middle point of the two speakers

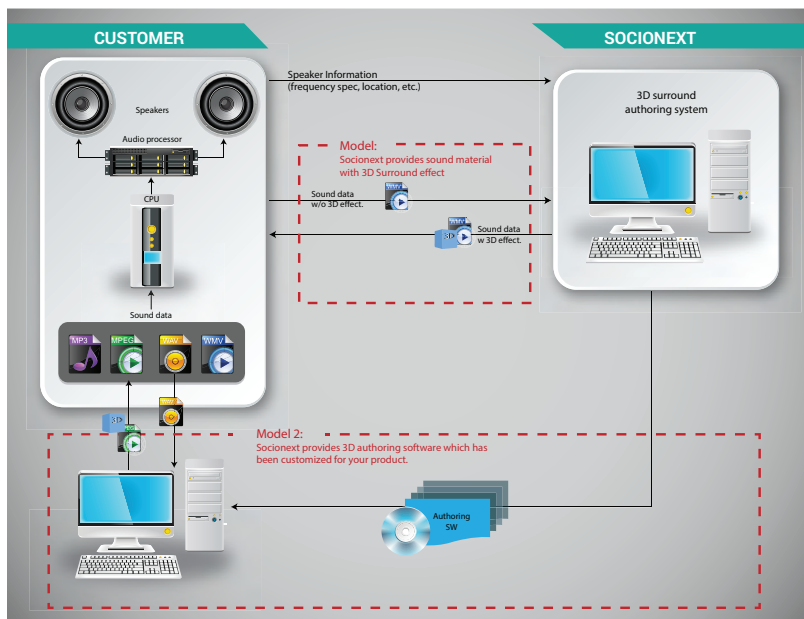


Entertainment Devices & Digital Signage



The spatial-acoustics technology generates a lifelike, immersive experience, enhancing the sense of presence and increasing the value of end products.

How to Create 3D Audio



Features & Benefits

- Provides an amazing sense of presence as if the sound source were in close proximity to the listeners
- Controls the direction of the sound from just the front speakers
- Processes the playback sounds off-line, eliminating the need for hardware modifications

Applications

- Gaming consoles
- Gaming devices
- Digital signage
- Arcade games

3D Surround Sound Solution for In-vehicle Sound Alert HMI



The Socionext 3D acoustic-surround technology enhances the driving experience and improves safety through audible navigational assistance and alerts.

Versatile Implementation

The robust sound-location technology can work with any in-vehicle speaker layout and in other challenging situations.



Typical Configuration

Symmetrical speakers generate 3D sound effects.



Other Configurations

The 3D sound effect can be generated even under challenging conditions such as a non-symmetrical speaker layout or complex acoustic reflections.

Features & Benefits

- Sound-location technology helps drivers receive alerts and other information from in-vehicle applications such as driver-assistance and infotainment systems
- The 3D authoring tool processes the sound off-line, eliminating the need for a DSP
- The “close-to-the-ear” effect makes it seem as if the driver were wearing earbuds

Applications

- State-of-the-art user interface (UI) with sound localization
- Control for in-vehicle applications, such as advanced driver-assistance (ADAS) and infotainment systems

Bass Boost Solution



Small, thin speakers typically cannot reproduce low-frequency sounds. The Socionext bass-boost technology enables even inexpensive speakers to reproduce rich sounds in that register, creating an unparalleled sense of presence. With this technology, the sound quality of existing systems can be significantly enhanced without having to modify the hardware, change the cabinet or add a DSP.

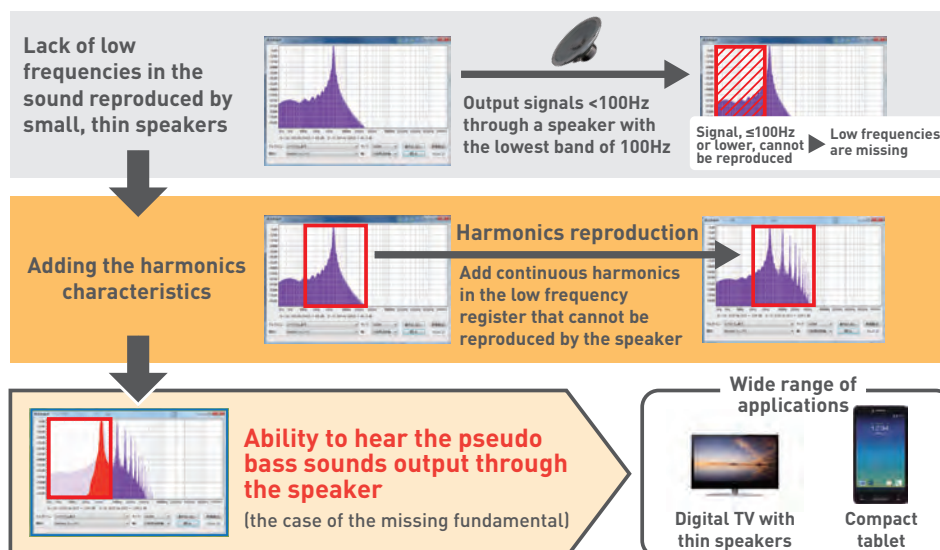
Features & Benefits

- Extends the audible range of the human ear
- Reproduces pseudo-bass sounds by complementing missing continuous harmonics in the low-frequency register
- Includes bass boost and voice-clarification technologies
- Enables compact speakers, which have a narrow band of frequencies, to reproduce rich bass sounds
- Requires no hardware modifications

Applications

- Digital TVs
- Notebook computers
- Mobile devices
- Technology Principles

Technology Principles



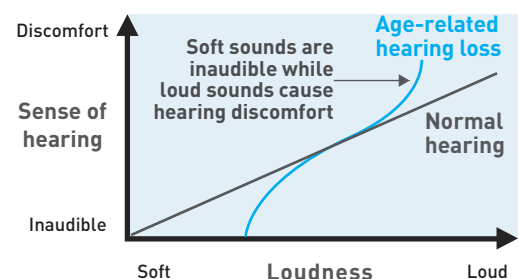
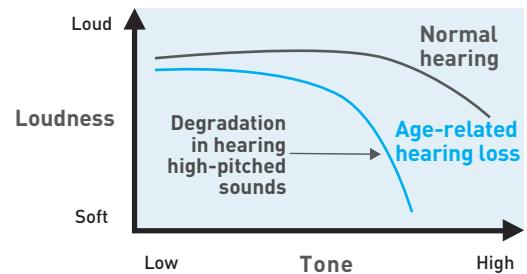
Audio Solution to Improve TV Viewing Experience



Most people with hearing loss turn up the volume on the TV, but that can be too loud for their friends and family. The Socionext technology enables both the hearing-impaired and others to watch TV comfortably together.

Features & Benefits

- Applies the same non-linear-amplification technology used in digital hearing aids to TV viewing
- Amplifies faint and ambient sounds
- Helps people who have trouble hearing high-pitched or soft sounds to watch TV in comfort
- Reduces the need to adjust the volume to control sudden loud sounds
- Enables people of different ages to enjoy TV programs together



Signal before applying the technology







Signal after applying the technology



Whispering voices and faint ambient sounds (i.e., trickling water, bird singing) can be heard clearly

Sudden increase of sound volume, such as shouting, screaming and explosions, is adjusted to an appropriate level.

Solution	Description	Applications
	<p>Entertainment Devices and Digital Signage</p>	<ul style="list-style-type: none"> • Gaming consoles • Gaming devices • Digital signage • Arcade games
	<p>In-vehicle Infotainment & Driver-assistance Systems</p>	<ul style="list-style-type: none"> • High-performance user interface (UI) with sound localization • Control for in-vehicle applications, such as advanced driver-assistance (ADAS) and infotainment systems
	<p>Bass Boost Solution</p>	<ul style="list-style-type: none"> • Digital TVs • Notebook computers • Mobile devices
	<p>Audio Solution to Improve the TV Experience</p>	<ul style="list-style-type: none"> • Digital TVs • Audio systems