3D Audio Solutions
Software-Based 3D Audio Technology for Fast Hardware Implementation
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?

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.

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

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.

Distance between speakers: 15” to 20”

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

Play wave files with the PC and output the audio through headphone jack
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 offline, 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
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**

- Lack of low frequencies in the sound reproduced by small, thin speakers
- Output signals <100Hz through a speaker with the lowest band of 100Hz
- Signal, ≤100Hz or lower, cannot be reproduced
- Low frequencies are missing
- Adding the harmonics characteristics
- Harmonics reproduction: Add continuous harmonics in the low frequency register that cannot be reproduced by the speaker
- Ability to hear the pseudo bass sounds output through the speaker (the case of the missing fundamental)
- Wide range of applications: Digital TV with thin speakers, Compact tablet
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

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<tr>
<th>Signal before applying the technology</th>
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<td>Whispering voices and faint ambient sounds (i.e., trickling water, bird singing) can be heard clearly</td>
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Signal after applying the technology

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<td>Sudden increase of sound volume, such as shouting, screaming and explosions, is adjusted to an appropriate level.</td>
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Whispering voices and faint ambient sounds (i.e., trickling water, bird singing) can be heard clearly.
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<th>Applications</th>
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<td>Entertainment Devices and Digital Signage</td>
<td>- Gaming consoles&lt;br&gt;- Gaming devices&lt;br&gt;- Digital signage&lt;br&gt;- Arcade games</td>
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<td>In-vehicle Infotainment &amp; Driver-assistance Systems</td>
<td>- High-performance user interface (UI) with sound localization&lt;br&gt;- Control for in-vehicle applications, such as advanced driver-assistance (ADAS) and infotainment systems</td>
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<td>Bass Boost Solution</td>
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