3D AudioSense SPATIAL SOUND RECORDING SYSTEM

3D AudioSense system allows for recording of spatial sound using miniature wireless microphones. This system not only captures the sound but also separates sound sources to enable easy manipulation of sound objects.

Description of the solution

3D AudioSense can be used to extract the sound of two different instruments and alter their spatial position. The system responds to the needs of both amateur musicians and professional recording studios interested in simplifying the costs of recording and processing of 3D sound. It is ideally suited for concerts, mass events and sporting events. 3D AudioSense is a product that offers compatibility with the latest standard MPEG 3D Audio.
3D AudiosSense is one of the first sound recording systems which makes the process of spatial sound recording independent from the sound reproduction source.

Novelty of the solution

The 3D AudioSense system uses a series of innovative technologies such as:
- object-oriented representation of spatial sound; the main feature of the product is the technology that allows direct recording of sound objects (guitar, vocals, etc.), which distinguish it from other systems that record multi-channel sounds,
- high quality transmission and coding of audio signals between acoustic sensors; low delay transmission (40 ms point-to-point); almost lossless compression (8:1) of audio signals with 24-bit / 192 kHz sampling,
- digital wireless audio transmission; wireless technology allows greater convenience for microphones placement and increases the mobility of the sound recording system by making it possible to use in areas where previously sound recording was much more difficult to realise (e.g. in forests, around water),
- use of the latest MPEG - H 3D audio coding standard; the developed 3D AudioSense sys-

tem will offer one of the first audio devices available on the market which will be fully compatible with the above standard.

Implementation status

The 3D AudioSense system is currently in the prototype phase. At the moment the company is finalising the work on integrating the system with the latest MPEG - H 3D audio coding standard.

Implementation benefits

Currently spatial sound recording systems use many wired microphones. As a result, the registered sound is closely associated with the signal reproduction system, for example. 2.0, 5.1, etc. 3D AudioSense uses advanced sound separation algorithms to generate sound objects at the output of the system which represent particular sound sources e.g. guitar, violin. This approach to sound recording carries a number of benefits:
- simplified sound production process (mastering) – the sound source is immediately available to the sound engineer who can for example impose appropriate filters and move the sources in 3D space,
- independence from the sound reproduction system,
- the ability to manipulate the volume of individual sound objects,
- the recording can be placed in any setting (many room acoustic choices),
- the simplification of the recording technique makes 3D AudioSense system easy to use even by amateur musicians.
Additional unique features of the product:
- low price of the device enables 3D spatial sound recording (for use at home),

- applications: immersive sound, recording large groups of musicians, creating a virtual sound stage, new possibilities of artistic expression, nature sounds recording,
- easy set up thanks to the BT LE wireless technology,
- no cables or wires,
- battery powered,
- high sound quality – HiFi,
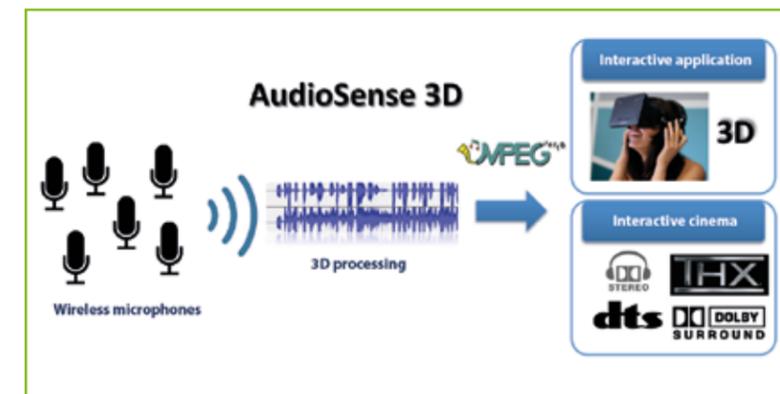- the possibility to reconstruct the recordings on any cinema system.

Comparison with the current state of the art

It should be emphasised that currently most of the solutions for wireless audio recording are dedicated to the recording and transmission of speech. In the case of soundstage recording, microphones with cables or beamforming based systems are still in use (where an array of microphones is used). The beamforming technique requires a large number of microphones for proper soundstage representation and consists in measuring the difference of signals from individual microphones. The technologies used in Zylia's system will result in better sound quality and spatial resolution than what is currently available on the market. This system allows also recording of spatial sound in both home and studio environ-

ments at a much lower cost than is currently possible. The reduction of the cost of the system is due to the use of cheap, battery powered, wireless devices. Another innovative solution used in the 3D AudioSense system is the utilisation of the latest coding standard MPEG-H 3D Audio. 3D AudioSense will offer one of the first audio devices that is fully compatible with the above-mentioned standard. The reduction of the cost of the system is due through the use of cheap, battery powered, wireless devices. Another innovative solution used by the 3D AudioSense system is the use of the latest coding standard MPEG-H 3D Audio. 3D AudioSense will offer one of the first audio devices that is fully compatible to the above-mentioned standard.

3D AudioSense acoustic sensor system prototype

Operation chart of 3D AudioSense system

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