Next-generation hi-fi: deepening the musical experience

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Remote controlled music par excellence. Photo: Semantic Hi-Fi

Large-scale digital music distribution is bringing about a profound revolution in the way we ‘consume’ music. The market is still in flux, but it is very clear that the hi-fi systems of the future will be significantly different to what we see today, say European researchers.

With the advent of compressed music files (MP3) and easily accessible internet file exchange and download services, consumers are increasingly turning to personal mini-databases of music files (iPod, MP3 players) for their musical enjoyment. The CD market has already taken a hard knock and many predict its imminent demise. The hi-fi market is also suffering with sales decreasing steadily every year.

In the future, the boundaries between the stereo system, computer and the television will become more and more blurred, but how the various

functions will combine, and what new ones will emerge, is still ‘a work in progress’.

The Semantic Hi-Fi project explored the possibilities opened up by the digital revolution and paved the way for the next wave of hi-fi, including a number of new features likely to change fundamentally the way we listen to and interact with music.

“Music is no longer limited by a fixed format. Network-based distribution has freed music from the limits imposed by these formats and opened a whole new range of possibilities which will encourage greater interaction with musical pieces,” says Hugues Vinet of the French music and acoustics research centre, IRCAM, which coordinated the project.

Introducing the active listener

The working prototype of this next-generation hi-fi, produced by the EU-funded Semantic Hi-Fi, incorporates a number of new functionalities to help promote a more interactive listening experience.

Using either a hand-held, touch screen remote, or the touch screen display on the central unit, the user will, for example, be able to visualise the structure of a piece through a graphic display which will enable them to navigate smoothly within a piece and even to modify elements of the musical composition: slow the tempo down, speed it up, modify the relative weight of different instruments in the piece, or remove them altogether…

Some of the results of the project have already been incorporated into new products. Project partner, Native Instruments, used many of Semantic Hi-Fi’s features for its ‘Traktor DJ Studio 3’ DJ software solution, hailed as one of the market leaders in its field. The prototype

developed by the project also incorporated many of these 'professional' tools into a home system accessible to all music lovers.

"The hi-fi of the future will make sophisticated software tools for professional musicians available to a wider public," notes Vinet. "Owners of next-generation hi-fi will be able to do more than just passively listen, they will have a tool which also allows them to manipulate music and to create new pieces themselves."

Hi-fis of the future will be linked up to the internet, and it will be possible to share personal works with others through peer-to-peer (P2P) systems. The project has not overlooked the issue of copyright, either.

"The P2P systems envisaged will respect the songs' copyrights by only transmitting the information necessary for editing and modifying them," stresses Vinet.

The ability to extract and display a whole range of information – tempo, key, lyrics, musical score – on a musical piece should also deepen the listeners musical knowledge and appreciation.

Managing your music

One of the challenges of the digital hi-fi will be managing extensive databases of music. It will no longer be a matter of simply grabbing a favourite CD from the shelf but of trawling through a database of perhaps tens of thousands of pieces. Semantic Hi-Fi, which concluded in November 2006, continued the work of Cuidado, an earlier EU-funded project, developing search engines capable of extracting information on musical content and providing tools for the effective management of musical 'libraries'.

As a result of this work, users of future hi-fi can expect to be able to

navigate easily through their collections using search criteria, such as tempo, genre, instrumentation, in addition to the traditional search criteria of artist and title. If you have a particular tune running through your head, but no information on it, you can simply hum the tune into the system's microphone and it will find it for you!

You can also start from a reference piece and search for those similar to it according to selected musical criteria. You can classify and retrieve your songs by defining your own musical categories from a set of track examples that will be automatically generalised to your whole database. Last but not least, the system computes 'musical summaries' that give a global idea, within a few tens of seconds, of the main changes occurring in the pieces (intro, chorus, verses, solos, etc.), thus enabling rapid 'auditory browsing'.

Many of the results of the project are now available for licensing and several are being developed further within the context on new research projects. Targeted applications include multimedia search engines, music portals, and automatic play-list generation.

Source: ICT Results