

# Scuppering pirates improves internet audio

August 9 2007

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A new digital watermarking system not only protects music and media files from online pirates but also ensures that the quality for legitimate users is as good as it gets.

Shervin Shirmohammadi Hani Jabbour, and Jiying Zhao of the Discover lab at the University of Ottawa, Canada describe their new approach to beating music pirates today in Inderscience's International Journal of Advanced Media and Communication.

Streaming media and audio files enriches the internet experience for millions of users the world over. However, content creators, such as internet radio stations and podcasters face two major issues in delivering such materials.

The first is ensuring that their high-quality audio content reaches the user's speakers or headphones with high fidelity. The second involves the need to prevent users from duplicating their audio content and either re-selling it or distributing illegally to other users. As high-speed internet access and pervasive computing, such as smart phones and personal digital assistants (PDAs) become more common the opportunities for content pirates grow.

There are several audio watermarking systems available for copyright protection, but according to Shirmohammadi and colleagues few of these also act as quality of service (QoS) monitoring systems.

The advantage of tying together copyright protection and QoS is that the

system would have a smaller download footprint than the two alone. The QoS part of the system would allow the end user to choose the quality level for their download depending primarily on the speed of their internet connection or the sound quality of the device they are using. It would also mean that should copyright be broken then the quality of the audio download would suffer, making a pirate copy useless.

The researchers have now developed a copyright-QoS module that can be incorporated into an audio stream transmitted over the Internet. The module provides audio watermarking, copyright protection, data integrity, and authenticity together with QoS monitoring. These can all be fine-tuned for different applications, such as public and private streams, depending on the intended use.

The system involves using a computer algorithm to embed an image within the audio file. The image acts as a digital watermark but does not interfere with the sound. Should there be loss of quality during the download, then the image interpretation component of the audio streaming software on the user's device will alert the user to a problem, providing the QoS aspect of the system.

"The prototype system is transparent," say the researchers, "and works ubiquitously on any captured audio." The team has tested its performance and demonstrated the feasibility of real-time audio streaming with QoS and copy protection. The next step will be to extend the work beyond streaming audio to compressed formats, such as the well-known mp3 file, for example.

Source: Inderscience Publishers

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