

and the 3dB width were about -15.8dB and 23 in case of no synthesis. However, the proposed method by 5 syntheses showed about 22.6dB and 3, respectively.

69. 다운믹싱에 강한 디지털 오디오 워터마킹 기법에 관한 연구

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In recent year, the use of digital multimedia content has increased explosively because of rapid progress of digital and network technologies. However, this increasing of the use of digital multimedia content were raised a problem that distribute illegal copied digital multimedia content. Therefore, it was necessary to research the copyright protection technique.

The digital watermarking is one of protection technique for the digital multimedia content, which is to embed the copyright information and additional information into the digital multimedia content. And the embedded information data is called to the watermark.

The Digital audio watermarking is to embed information into the digital audio content. There are three kinds of way for embedding the digital audio watermark signal; spread spectrum coding, echo coding, and phase coding. These embedded watermark signals must be extracted although it comes under various attacks; the A/D-D/A converting, cropping, down mixing, low pass filtering, and so on.

In this thesis, we suggest the new robust watermarking technique against the down mixing attack which is satisfied with SDMI(Secured Digital Music Initiative) the Phase II Screening. The proposed watermarking algorithms are the watermark embedding and extracting algorithm in multi-channel audio data and the extracting algorithm even though multi-channel audio data was down-mixed. The proposed embedding and extracting algorithms have high information embedding efficiency as embedding PN code in each channel using interleave sequence. Also, we propose the algorithm that is able to return to original watermark signals perfectly when the multi-channel audio data applied the proposed algorithm is attacked down-mix.