Procedures for Second Watermark Competition　(Video)

IEICE Technical Committee Conference on Enriched Multimedia
Information Hiding Criteria (IHC)
Video
March 2013 (ver. 2)

1. Watermark Competition

Copyright protection has become an important issue due to the growing amount of illegal content being distributed all over the world. The IHC Committee is working to improve this situation through the use of watermarking technologies. In particular, it aims to develop standard evaluation criteria and to sponsor watermark competitions based on these criteria to promote the development of protection measures for the content industry. Since all video and image content on the market is distributed after coding, tolerance against coding is considered to be the top priority. The evaluation criteria will be revised in accordance with the advances in watermarking technology, the needs of the content industry, and the practicality of the competition.

The second competition requires MPEG-2 coding tolerance. Entrants should explain in their entry reports all of the tolerances of their watermarking scheme. These tolerances will also be assessed, and points will be awarded on the basis of concrete data supporting them.

1.1 This document is written on the basis of the image and video watermark standard, version 2, and is dated 28 March 2013.

1.2 Robust and Blind Watermarking

A robust watermark will be used to protect the copyright of the content. The content holder's name, the provider's name, and other information will be embedded into the content. The embedded information will be used to trace or to activate the copy protection system.

Although robust watermarking technologies based on using original video may work since the content holder has the original, the cost of a practical watermarking system would be higher if the detection process uses the original video. The IHC Committee thus will not accept the submission of schemes that use a robust watermark with the original video sequences.

1.3 Content Flow

The detail of the standard is described in the "Evaluation Standards for Robust

Watermarks" (ver. 2). Each entrant should embed the information mentioned above into the five HDTV video sequences specified in the ITE standard movie, and the sequences should be coded using MPEG-2 at less than 1/100 the bit rate of the original HDTV bit rate (1.2 Gbps). Since the bit rate of the coded sequence is less than 100 Mbps, the average file stream size should be less than 100 Mbps. The coded bit stream should be decoded, and the decoded 1.2-Gbps HDTV sequences should be converted into an analogue video signal with a digital/analogue (D/A) converter. The analogue video signal should then be converted into a digital bit stream with an analogue/digital (A/D) converter. These D/A and A/D processes are necessary since the digital HDTV content is protected by a digital rights management system. However, the content can be easily copied if the content is converted into analogue format. Robust watermarking technologies must have tolerance against the D/A and A/D processes.

Entrants should test detection of the embedded information after the A/D conversion. The volume of embedded information should be 16 bits per 15 seconds. Entrants should calculate the average bit error rate for the embedded information and the average peak signal to noise ratio (PSNR) of each video sequence and include the results in their entry reports.

Entrants should also include abstracts of the embedding and detection algorithms. Entrants who do not want to reveal their algorithms should contact the IHC Committee in advance. The Committee will assess the submitted proposals and determine the awards to be presented for excellence.

The current schedule is shown below. Any changes will be posted on the IHC web page.

- Submission deadline: 30 June 2013
- Submission e-mail: image@sec.ee.kagu.tus.jp
- Evaluation period: July to August
- Awards presentation: September 2013 (FIT2013)

2. Information Required for Submission
   - Full names, affiliations, and e-mail addresses of each person in the entrant group
   - Abstract of embedding algorithm
   - Abstract of detection algorithm
   - PSNR data and average error rates for five video sequences

   The submitted schemes will be ranked using the process described in section 3.

Entrants can enter the awards competition. Entrants should declare which award they are aiming at and should submit appropriate data for that award.

Since the copyright of the report and data belong to the entrant, they can be submitted or published elsewhere. However, the appropriate process should be followed before submission since the technical information will be made publicly available.

Entrants can submit the technology with the electronic document by referring a public document if the technology was used before. In this case, the parameters used and the differences from the previously used technology should be submitted with the electronic document.

Entrants are required to share the information in the submitted report and are requested to present the information at an IEICE conference.

3. Awards

- Highest Tolerance Award

  This award is given to the entry with the highest compression ratio for the five video sequences under the conditions of the IHC standards, version 2

- Highest Image Quality Award

  This award is given to the entries with an average error rate less than or equal to 1.0% as well as to the entry with the highest average PSNR. A subjective assessment will be made if necessary.

- Special Award

  This award is given at the discretion of the IHC Committee.