

Procedures for Second Watermark Competition (Images)

IEICE Technical Committee Conference on Enriched Multimedia

Information Hiding Criteria (IHC)

Images

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 watermark technologies. In particular, it aims to help 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 delivered 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 as a minimum both coding tolerance and cropping 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 22 March 2013.

1.2 Robust 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 as a robust watermark. The embedded information will be used to trace or to activate the copy protection system.

1.3 Content Flow

The detail of the standard is described in the "Evaluation Standards for Robust Watermarks" (ver. 2). Six images (4608×3456) are available for download on the IHC website. Each entrant should use his or her watermarking technology to embed the information described in 1.2 into all six images. After each image file has been encoded twice, the file must be smaller than 1/30 the size of the original image file. The file size percentages are based on the original file being the size of a

YUV422 file. After each image file has been decoded twice, the peak signal to noise ratio (PSNR) between the original and watermarked images should be calculated. The PSNR must be higher than 30 dB. After the second decoding, the embedded information should be detected from HDTV-size (1920×1080) cropped images. The embedded 200 bits should be detectable.

The PSNR calculation and embedded information detection should be done by the entrant, and the results should be included in the entry reports. The reports should also include abstracts of the embedding and detection algorithms. Entrants who do not want to reveal their algorithms should contact the IHC Committee before submitting their report. The Committee will assess the submitted entries 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 rate for six images
- Error rates for ten HDTV areas after second decoding

Table 1: PSNR and average error rate after second decoding

	Compression ratio		PSNR (dB)		Average error rate (%)
	1 st coding	2 nd coding	1 st coding	2 nd coding	
Flower garden					
Street view					
Library					
Port view					
Bus					
Flower pot					

Table 2: Error rate for ten HDTV-size areas in images (%)

Area	1	2	3	4	5	5	6	7	8	9	10
Flower garden											
Street view											
Library											
Port view											
Bus											
Flower pot											

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 data appropriate 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 six images 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.