开源视频质量评价工具： IQA

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Image Quality Assessment (IQA)是一个快速，精确，可靠 的测量视频/图像质量的基于C的库。

它实现了很多流行的算法比如 MS-SSIM, SIMM, MSE 和 PSNR。

其提供的方法在iqa.h中，如下所示：

```cpp
/*
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 */

#ifndef _IQA_H_
#define _IQA_H_

#include "iqa_os.h"

/**
 * Allows fine-grain control of the SSIM algorithm.
 */
struct iqa_ssim_args {
    float alpha;    /**< luminance exponent */
    float beta;     /**< contrast exponent */
    float gamma;    /**< structure exponent */
    int L;          /**< dynamic range (2^8 - 1)*/
    float K1;       /**< stabilization constant 1 */
    float K2;       /**< stabilization constant 2 */
    int f;          /**< scale factor. 0=default scaling, 1=no scaling */
};

/**
 * Allows fine-grain control of the MS-SSIM algorithm.
 */
struct iqa_ms_ssim_args {
    int wang;             /**< 1=original algorithm by Wang, et al. 0=MS-SSIM* by Rouse/Hemami (default). */
    int gaussian;         /**< 1=11x11 Gaussian window (default). 0=8x8 linear window. */
    int scales;           /**< Number of scaled images to use. Default is 5. */
    const float *alphas;  /**< Pointer to array of alpha values for each scale. Required if 'scales' isn't 5. */
    const float *betas;   /**< Pointer to array of beta values for each scale. Required if 'scales' isn't 5. */
    const float *gammas;  /**< Pointer to array of gamma values for each scale. Required if 'scales' isn't 5. */
};

/**
 * Calculates the Mean Squared Error between 2 equal-sized 8-bit images.
 * @note The images must have the same width, height, and stride.
 * @param ref Original reference image
 * @param cmp Distorted image
 * @param w Width of the images
 * @param h Height of the images
 * @param stride The length (in bytes) of each horizontal line in the image.
 *               This may be different from the image width.
 * @return The MSE.
 */
float iqa_mse(const unsigned char *ref, const unsigned char *cmp, int w, int h, int stride);
```

```
76.
77.  /**
78.   * Calculates the Peak Signal-to-Noise-Ratio between 2 equal-sized 8-bit
79.   * images.
80.   * @note The images must have the same width, height, and stride.
81.   * @param ref Original reference image
82.   * @param cmp Distorted image
83.   * @param w Width of the images
84.   * @param h Height of the images
85.   * @param stride The length (in bytes) of each horizontal line in the image.
86.   *               This may be different from the image width.
87.   * @return The PSNR.
88.   */
89.  float iqa_psnr(const unsigned char *ref, const unsigned char *cmp, int w, int h, int stride);
90.
91.  /**
92.   * Calculates the Structural SIMilarity between 2 equal-sized 8-bit images.
93.   *
94.   * See https://ece.uwaterloo.ca/~z70wang/publications/ssim.html
95.   * @note The images must have the same width, height, and stride.
96.   * @param ref Original reference image
97.   * @param cmp Distorted image
98.   * @param w Width of the images
99.   * @param h Height of the images
100.  * @param stride The length (in bytes) of each horizontal line in the image.
101.  *               This may be different from the image width.
102.  * @param gaussian 0 = 8x8 square window, 1 = 11x11 circular-symmetric Gaussian
103.  * weighting.
104.  * @param args Optional SSIM arguments for fine control of the algorithm. 0 for
105.  * defaults. Defaults are a=b=g=1.0, L=255, K1=0.01, K2=0.03
106.  * @return The mean SSIM over the entire image (MSSIM), or INFINITY if error.
107.  */
108. float iqa_ssim(const unsigned char *ref, const unsigned char *cmp, int w, int h, int stride,
109.     int gaussian, const struct iqa_ssim_args *args);
110.
111. /**
112.  * Calculates the Multi-Scale Structural SIMilarity between 2 equal-sized 8-bit
113.  * images. The default algorithm is MS-SSIM* proposed by Rouse/Hemami 2008.
114.  *
115.  * See https://ece.uwaterloo.ca/~z70wang/publications/msssim.pdf and
116.  * http://foulard.ece.cornell.edu/publications/dmr_hvei2008_paper.pdf
117.  *
118.  * @note 1. The images must have the same width, height, and stride.
119.  * @note 2. The minimum image width or height is 2^(scales-1) * filter, where 'filter' is 11
120.  * if a Gaussian window is being used, or 9 otherwise.
121.  * @param ref Original reference image
122.  * @param cmp Distorted image
123.  * @param w Width of the images.
124.  * @param h Height of the images.
125.  * @param stride The length (in bytes) of each horizontal line in the image.
126.  *               This may be different from the image width.
127.  * @param args Optional MS-SSIM arguments for fine control of the algorithm. 0
128.  * for defaults. Defaults are wang=0, scales=5, gaussian=1.
129.  * @return The mean MS-SSIM over the entire image, or INFINITY if error.
130.  */
131. float iqa_ms_ssim(const unsigned char *ref, const unsigned char *cmp, int w, int h, int stride,
132.     const struct iqa_ms_ssim_args *args);
133.
134. #endif /* IQA_H */
```

源代码下载： http://download.csdn.net/detail/leixiaohua1020/6376741

SourceForge项目页面： http://sourceforge.net/projects/iqa/

项目官方页面： http://tdistler.com/iqa/

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