Estimate HRC (Hypothetical Reference Circuit) Fraction Dropped Frames (FDF)using Reduced Reference (RR) and No Reference (NR) Video Quality Metrics (VQMs)
EST_HRC_FDF_RR
Software Release Version 1.2
Release Notes
July, 2011

This file contains information about the above product in the following sections:

1) Release Contents

The EST_HRC_FDF_RR software was developed by the Institute for Telecommunication Sciences (ITS). EST_HRC_FDF_RR performs automated processing on all video files in a user specified directory and with a user specified test name to estimate the fraction of dropped frames (FDF) using either a No Reference (NR) or Reduced Reference (RR) video quality metric (VQM). The program has a number of command line options that can be used to adjust the algorithm behavior and its outputs (see section 10 Input and Output Arguments).

2) Package Contents

The EST_HRC_FDF_RR software Version 1.2 package contains the following:

Installation related files:
- MCRInstaller.exe

Software related files:
- est_hrc_fdf_rr.exe

Video Sequences:
- fdf_calmob_original.yuv
- fdf_calmob_hrc2.yuv
- fdf_flogar_original.yuv
- fdf_flogar_hrc1.yuv

Technical documentation:
- est_hrc_fdf_rr_pc_readme.pdf
- ntia_tm_09_456.pdf
- vpqm_09.pdf

If any of these files are missing, you have not received an official distribution of the EST_HRC_FDF_RR software.

3) System Requirements

EST_HRC_FDF_RR software version 1.2 requires the following software and hardware:

Minimum Configuration:

Processor	2.0 GHz Pentium
RAM	2.0 GB (for SD video), >4.0 GB (for HD video)
Software	XP 32-bit (for 32-bit executable), Windows 7 64-bit (for 64-bit executable). The software may run under Vista but this has not been tested.
Disk	>4 GB free disk space

4) Technical Support Information

Please send any problems or requests for future improvements to vqm@its.bldrdoc.gov

For information on other video quality NTIA/ITS publications, visit <http://www.its.bldrdoc.gov/pub/n3/video/index.php >. For information on other NTIA/ITS publications, visit the NTIA/ITS web site at <www.its.bldrdoc.gov>. Other video quality measurement software tools may be obtained at <http://www.its.bldrdoc.gov/vqm/>.

5) Install/Uninstall Instructions

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*****Install Instructions
****

The EST_HRC_FDF_RR software was developed using MATLAB and its associated toolboxes. It is therefore necessary to install the MATLAB Component Runtime (MCR) library before running EST_HRC_FDF_RR. If a prior version of EST_HRC_FDF_RR was installed, you must first uninstall the old version of the MATLAB Component Runtime Library before proceeding (see Uninstall Instructions below). Follow this installation procedure for EST_HRC_FDF_RR:

1. Copy the distribution files to a directory on your computer. This directory will be denoted as c:\FDF for the rest of the installation instructions given below.

2. Double click MCRInstaller.exe in c:\FDF and follow the instructions to install the MCR library on your computer.

3. After completing installation, check to make sure that the MATLAB Component Runtime library installed properly. From the "Start" menu, select "Control Panel", and in the window that appears, double-click "Add or Remove Programs" and see if the MATLAB Component Runtime library appears in the list of installed programs. If not, repeat step 2.

```
****************************************
*****Uninstall Instructions
****************************************
```
1. Select "Start", "Control Panel", "Add/Remove Programs". From the list of programs, select "MATLAB Component Runtime", and press "Remove".

2. Delete your installation directory and all files in it.

6) Operating Instructions

Open a command prompt window by selecting "Start", "Program", "Accessories", "Command Prompt". Change to the c:\FDF installation directory in step 1 of the Installation Instructions by typing "cd c:\FDF" at the command prompt.

To start the EST_HRC_FDF_RR software, type "est_hrc_fdf_rr" at the command prompt.

Execute EST_HRC_FDF_RR with no arguments for syntax and brief operating instructions. See also #10 below for details.

Since EST_HRC_FDF_RR loads the entire original and processed video clips into memory in double precision format, you may encounter out of memory problems for long video sequences and/or high resolution video sequences (e.g., HDTV). The solution to this problem is to utilize the 64-bit executable version and to install 4 GB or more of RAM.

7) Product Release Notes

Version 1.0 is the first released version of the software.

The following changes have been made in version 1.2 (when compared with version 1.1):

1. Improvements and bug fixes have been made to the read_avi function, including support for the ‘YV12’ format.

The following changes have been made in version 1.1 (when compared with version 1.0):

1. Improved read_avi function to read more uncompressed formats and files larger than 2 GB. Support has been added for 10-bit uncompressed UYVY files in the ‘V210’ format (but the read times are very slow).

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10) Input and Output Arguments

Documents ntia_tm_09_456.pdf and vpqm_09.pdf, provided with this release, provide a preliminary description of the EST_HRC_FDF_RR algorithms and MATLAB reference code. Additions were made to the EST_HRC_FDF_RR routine so it could allow the user to specify an output file that will contain the results. The following three command line arguments are required by EST_HRC_FDF_RR:

'clip_dir' Specifies the directory that contains the original and processed video clip pairs.

'test' The name of the video test to process. Video files in the clip_dir must conform to standard naming conventions, test_scene_hrc.yuv (for Big YUV files) and test_scene_hrc.avi (for uncompressed UYVY AVI files), with no extra '_' or '.' in the file names. 'test' is the name of the test, 'scene' is the name of the scene, and 'hrc' is the name of the HRC. The original reference clip must have an HRC name of 'original' (original test clips are only required if running the software with the 'RR' option).

'results_file' The full path name of the file to save FDF results, in Comma-Separated Values (CSV) format.

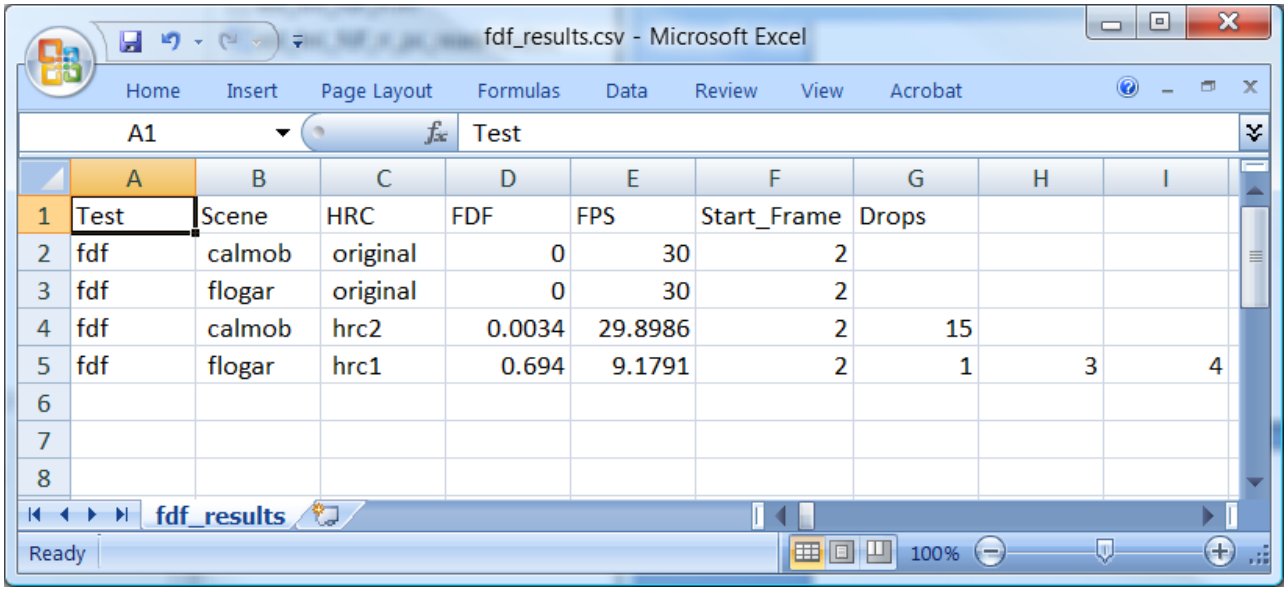
Run EST_HRC_FDF_RR with no command line options to obtain further help information and documentation and to obtain a complete list of the optional command line arguments accepted by the software.

11) Validation

To validate EST_HRC_FDF_RR, run on the provided video sequences with the following command line (this assumes that the software was installed as given in item 5):

```
est_hrc_fdf_rr 'c:\fdf' 'fdf' 'fdf_results.csv' 'yuv' 144 176 30 'sroi' 5 5 140 172 'verbose'
```

The file 'fdf_results.csv' will be created that contains these results when loaded into a spreadsheet program. The last line in the spreadsheet (line 5) continues past column I.



	A	B	C	D	E	F	G	H	I
1	Test	Scene	HRC	FDF	FPS	Start_Frame	Drops		
2	fdf	calmob	original	0	30	2			
3	fdf	flogar	original	0	30	2			
4	fdf	calmob	hrc2	0.0034	29.8986	2	15		
5	fdf	flogar	hrc1	0.694	9.1791	2	1	3	4
6									
7									
8									