Integration of VQM on VMAF framework

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Introduction

• Motivation: Availability of a package of metrics supporting 10-bit videos
  • Integration of VQM in VMAF framework

• First approximation:
  • Use of the source code provided by ITS for Matlab.
    • Executables provided by ITS only for Windows.
    • VMAF works on Linux and MAC (on Windows via virtual environments).
  • Executables created with Matlab Compiler → Matlab Runtime is needed (free).
  • Parsing of the input videos: conversion to “avi” yuyv422 (8-bit)

• Available on: https://github.com/Netflix/vmaf/tree/icip2017gc
  • Contributions are welcome
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Results file:
- VMAF: features per frame and global
- PSNR: per frame and global
- SSIM: per frame and global
- MS-SSIM: per frame and global
- VIF: per frame and global
- VQM: global score

Input Video (10 bits)

Video parser

VMAF metric
PSNR metric
SSIM metric
MS-SSIM metric
VIF Runner

VQM metric

Video Parser (Ffmpeg: “avi” 8 bits)
Preliminary results

- 4 HD videos, 10-bit (from a dataset for texture coding).
- Expert subjective assessment to fix target MOS.

- Good correlation of $VQM_{VFD}$, $VMAF$ and $VQM_{general}$ with target MOS.
- Poor performance of the rest because of the nature of the content.
Possible future improvements

• Modify VQM source code to avoid conversion to 8 bits.
• Get C++ implementations:
  • VFD → Out of memory with UHD or long HD videos.
  • Independence from Matlab Runtime.
• Better integration to allow flexibility in calling to VQM (input parameters: model, calibration, etc.)
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