Integration of VQM on VMAF framework

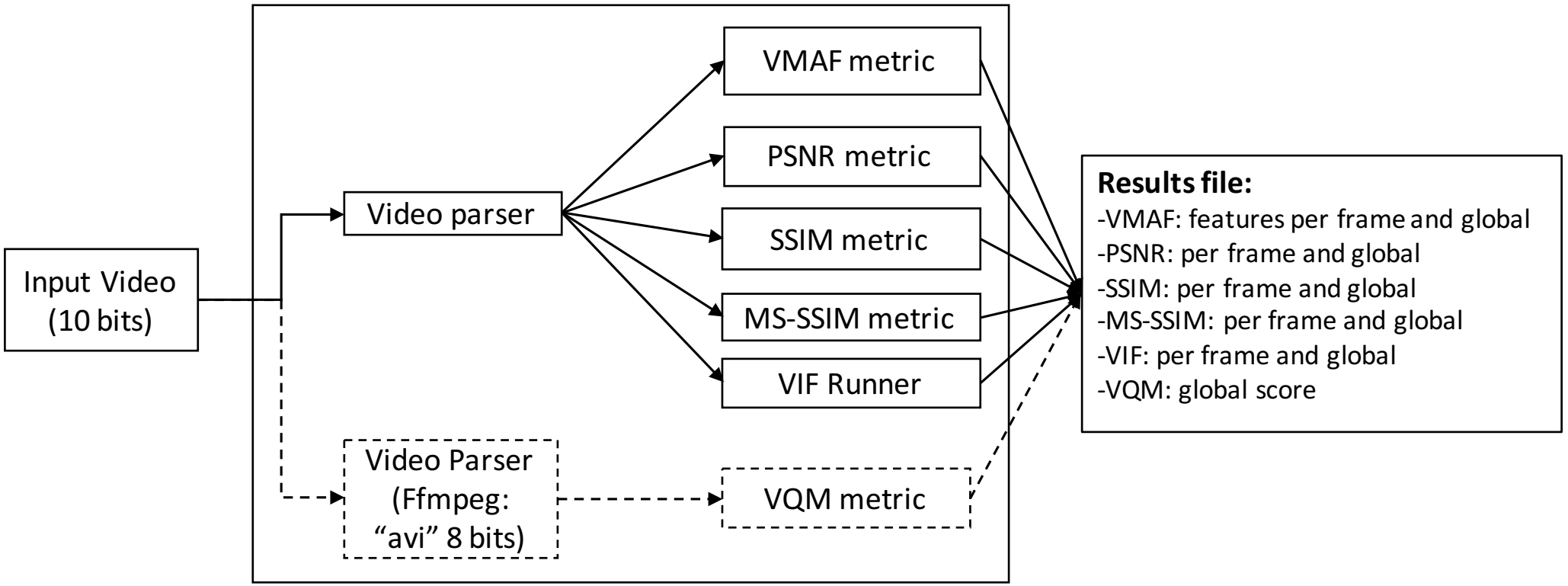
Université de Nantes: Jesús Gutiérrez, Lukas Krasula, Patrick Le Callet

In collaboration with Netflix: Zhi Li, Ioannis Katsavounidis

Introduction

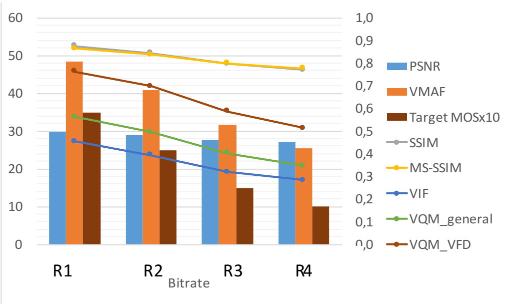
- Motivation: Availability of a package of metrics supporting 10-bit videos
  - Integration of VQM in VMAF framework
- First approximation:
  - Use of the source code provided by ITS for Matlab.
    - Executables provided by ITS only for Windows.
    - VMAF works on Linux and MAC (on Windows via virtual environments).
  - Executables created with Matlab Compiler → Matlab Runtime is needed (free).
  - Parsing of the input videos: conversion to “avi” yuyv422 (8-bit)
- Avilable on: https://github.com/Netflix/vmaf/tree/icip2017gc
  - Contributions are welcome

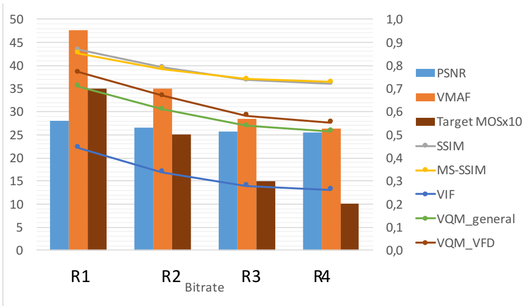
Integration of VQM in VMAF framework

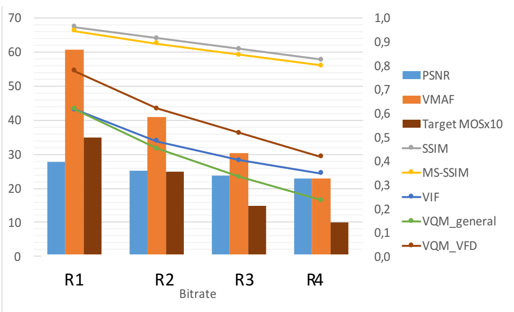


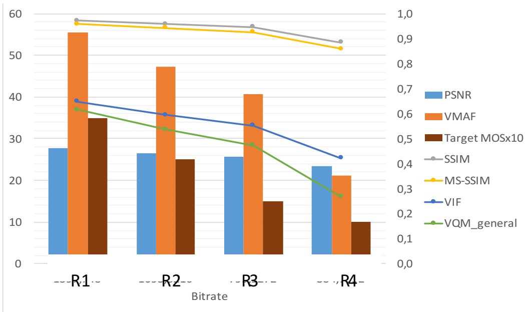
Preliminary results

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









Pearson Correlation

PSNR (Lin)	VMAF (Lin)	SSIM (poly)	MS-SSIM (poly)	VIF (exp)	VQM (poly)	VQM_VFD (poly)
0.663	**0.9216**	0.5755	0.601	0.6779	**0.8163**	**0.9691**

Spearman Correlation

PSNR (Lin)	VMAF (Lin)	SSIM (poly)	MS-SSIM (poly)	VIF (exp)	VQM (poly)	VQM_VFD (poly)
0.7276	0.958	0.5578	0.6185	0.667	0.8125	0.950

MSE

PSNR (Lin)	VMAF (Lin)	SSIM (poly)	MS-SSIM (poly)	VIF (exp)	VQM (poly)	VQM_VFD (poly)
0.7188	0.3728	0.7852	0.7674	0.7245	0.5546	0.2368

- 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.)

Integration of VQM on VMAF framework

Université de Nantes: Jesús Gutiérrez, Lukas Krasula, Patrick Le Callet

In collaboration with Netflix: Zhi Li, Ioannis Katsavounidis