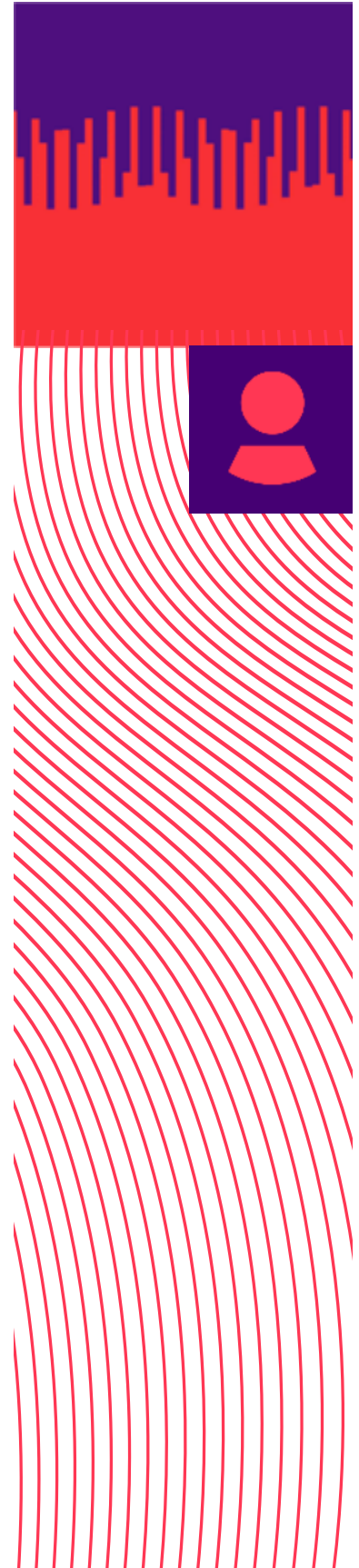


AV1 and VVC Performance Evaluation

October 2019

bbc.co.uk/rd



Configuration parameters

This document describes the configuration parameters used for each of the three video codecs used in the performance evaluation by BBC Research & Development, as published in May 2019.

Codec versions:

AV1 : v 1.0.0-1376-g6e8b4d9

VVC : VTM v4.0

HEVC : HM 16.10

Test sequences:

Name	Resolution	Frame rate	No. of frames
Voiles	UHD – 3840x2160	60	600
Manege	UHD – 3840x2160	60	600
Book	UHD – 3840x2160	50	500
YoungDancers2	UHD – 3840x2160	50	500
ParkDancers	UHD – 3840x2160	50	500
OldTownCross	HD – 1920x1080	50	500
ParkJoy	HD – 1920x1080	50	500
CrowdRun	HD – 1920x1080	50	500
PedestrianArea	HD – 1920x1080	25	250
RitualDance	HD – 1920x1080	60	600



AV1 and VVC Performance Evaluation

Command line options

AV1:

General parameters:

```
--codec=av1 --frame-parallel=0 --tile-columns=0 --threads=1 --lag-in-frames=0  
--verbose --psnr --tune=psnr --drop-frame=0 --static-thresh=0 --bit-depth=12 --  
input-bit-depth=8
```

```
1-pass default speed : --cpu-used=0 --passes=1  
1-pass fast speed   : --cpu-used=8 --passes=1  
2-pass default speed : --cpu-used=0 --passes=2  
2-pass fast speed   : --cpu-used=8 --passes=2
```

Sequence specific parameters:

```
Voiles           : --kf-min-dist=64 --kf-max-dist=64  
Manege           : --kf-min-dist=64 --kf-max-dist=64  
Book             : --kf-min-dist=48 --kf-max-dist=48  
YoungDancers2   : --kf-min-dist=48 --kf-max-dist=48  
ParkDancers     : --kf-min-dist=48 --kf-max-dist=48  
OldTownCross    : --kf-min-dist=48 --kf-max-dist=48  
ParkJoy         : --kf-min-dist=48 --kf-max-dist=48  
CrowdRun        : --kf-min-dist=48 --kf-max-dist=48  
PedestrianArea  : --kf-min-dist=32 --kf-max-dist=32  
RitualDance     : --kf-min-dist=64 --kf-max-dist=64
```



VVC:

General parameters:

The default setting as per the JVET common test conditions available at:

JVET-N1010 - JVET common test conditions and software reference configurations for SDR video (F. Bossen, J. Boyce, X. Li, V. Seregin, K. Sühring)

Sequence specific parameters:

Voiles : --IntraPeriod=64,
Manege : --IntraPeriod=64,
Book : --IntraPeriod=48,
YoungDancers2 : --IntraPeriod=48,
ParkDancers : --IntraPeriod=48,
OldTownCross : --IntraPeriod=48,
ParkJoy : --IntraPeriod=48,
CrowdRun : --IntraPeriod=48,
PedestrianArea : --IntraPeriod=32,
RitualDance : --IntraPeriod=64,

HEVC:

General parameters:

The default setting as per the HM common test conditions available at:

JCTVC-AF1100 - Common test conditions for HM video coding experiments (K. Sharman, K. Sühring)

Sequence specific parameters:

Voiles : --IntraPeriod=64,
Manege : --IntraPeriod=64,
Book : --IntraPeriod=48,
YoungDancers2 : --IntraPeriod=48,
ParkDancers : --IntraPeriod=48,
OldTownCross : --IntraPeriod=48,
ParkJoy : --IntraPeriod=48,
CrowdRun : --IntraPeriod=48,
PedestrianArea : --IntraPeriod=32,
RitualDance : --IntraPeriod=64,

