Joint Video Exploration Team (JVET)
of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11
4th Meeting: Chengdu, CN, 15–21 October 2016

Document: JVET-D0026

Title: **AHG8: New GoPro Test Sequences for Virtual Reality Video Coding**

Status: Input Document to JVET

Purpose: Proposal

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Source: GoPro

Abstract

This contribution provides a new set of GoPro Virtual Reality (VR) video sequences. The new sequences are of much higher quality than the ones that were previously shared, with the hope that they would enable a more thorough testing for VR compression tools.

1 Introduction

In the last meeting, GoPro shared some VR test sequences with the goal that JVET would consider investigating compression tools for VR content [1]. Based on the overwhelming interest and valuable feedback, we felt that it was necessary to share some more content. The new content addresses limitations of the old content in following ways:

1) Higher resolution. Our new content is provided at 8192x4096 master resolution.
2) No encoding is done after stitching. This way, the new content has lesser compression artifacts
3) Lesser stitching artifacts, due to I) better stitching algorithms and II) the fact that our new camera rigs can do frame level synchronization (Genlock-ed)

2 Sequences

The 8K source files are being provided in equirectangular projection (ERP) format. The specifications of the files are tabulated below:

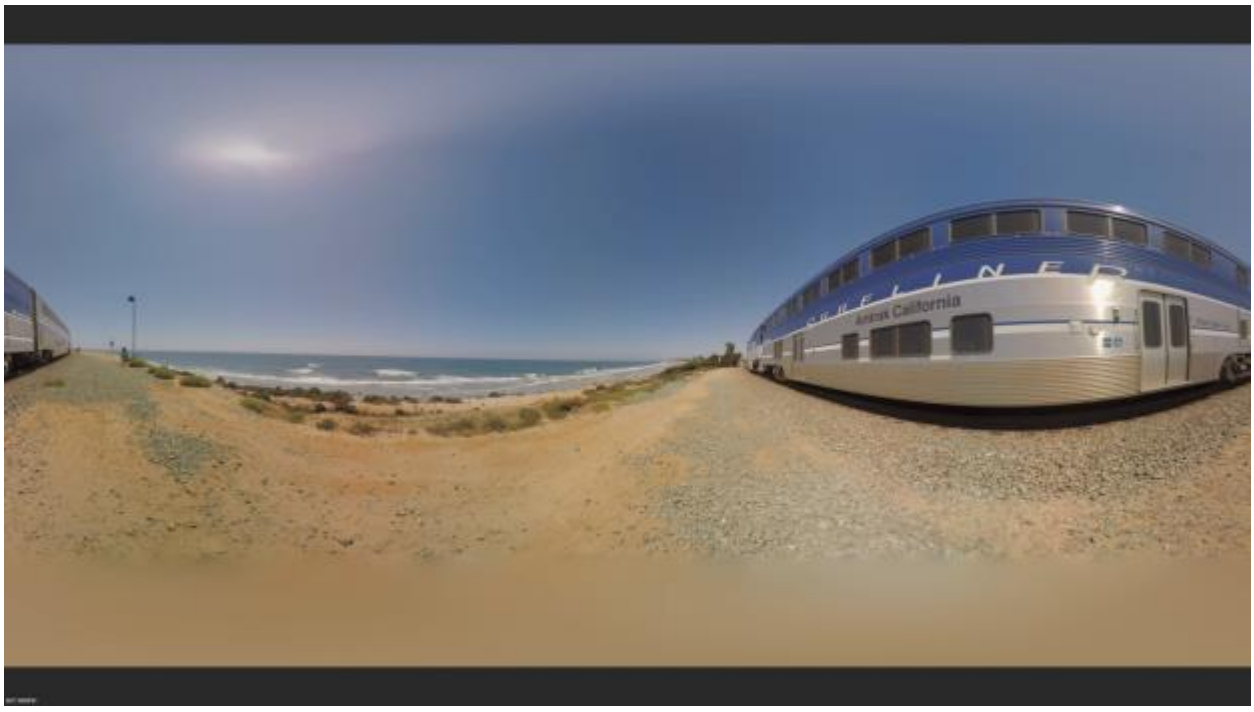
Sequence	Resolution@FPS	Bit Depth	#Frames	Stereo
train_le train_re	8192x4096@60	8	600	Yes
skateboard_trick_le skateboard_trick_re	8192x4096@60	8	600	Yes
jam_session_le jam_session_ re	8192x4096@30	8	300	Yes
basketball	8192x4096@30	10	300	No
chairlift_ride	8192x4096@30	10	300	No
skateboard_in_lot	8192x4096@30	10	300	No

The ERP-8K files have been converted to ERP-4K format using PCT360 software [2]. PCT360 does downsampling and upsampling along with format conversion in one step, by sampling points on a sphere. This provides higher quality resampling than using conventional 2D resampling method.

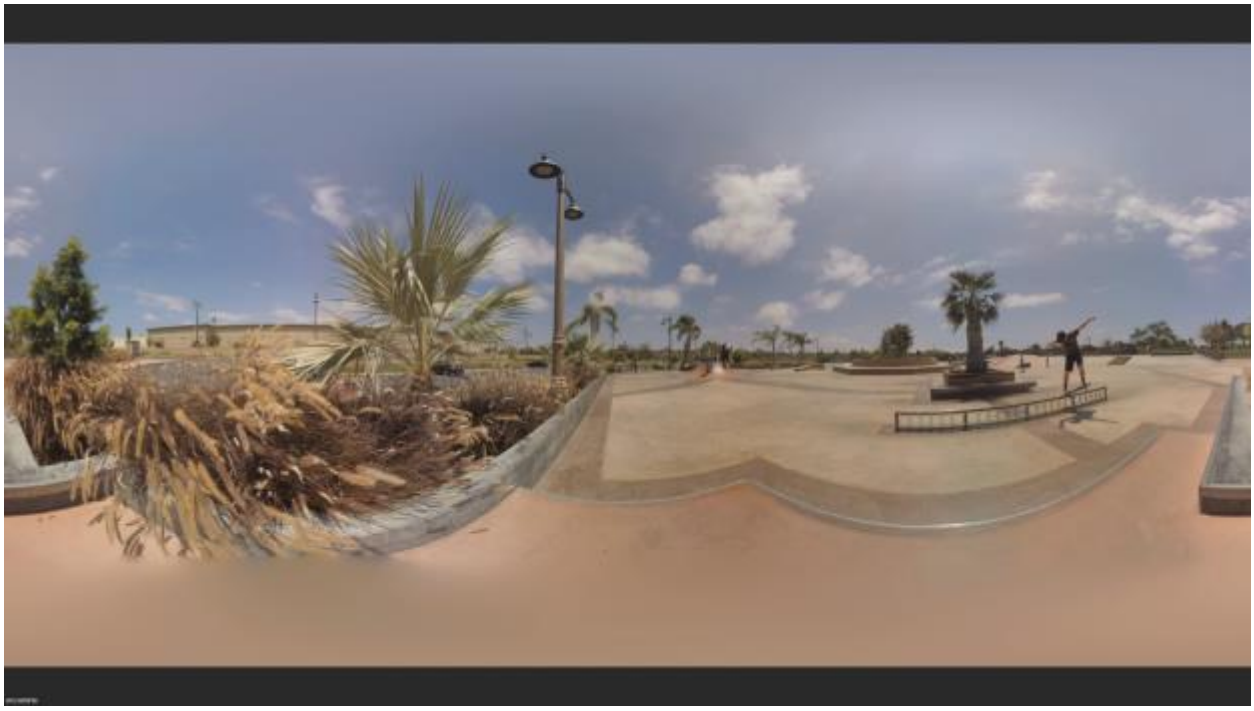
Following is an overview of the new 4K sequence files:

Sequence	Resolution@FPS	Bit Depth	#Frames	Stereo
train_le train_re	4096x2048@60	10	600	Yes
skateboard_trick_le skateboard_trick_re	4096x2048@60	10	600	Yes
jam_session_le jam_session_re	4096x2048@30	10	300	Yes
basketball	4096x2048@30	10	300	No
chairlift_ride	4096x2048@30	10	300	No
skateboard_in_lot	4096x2048@30	10	300	No

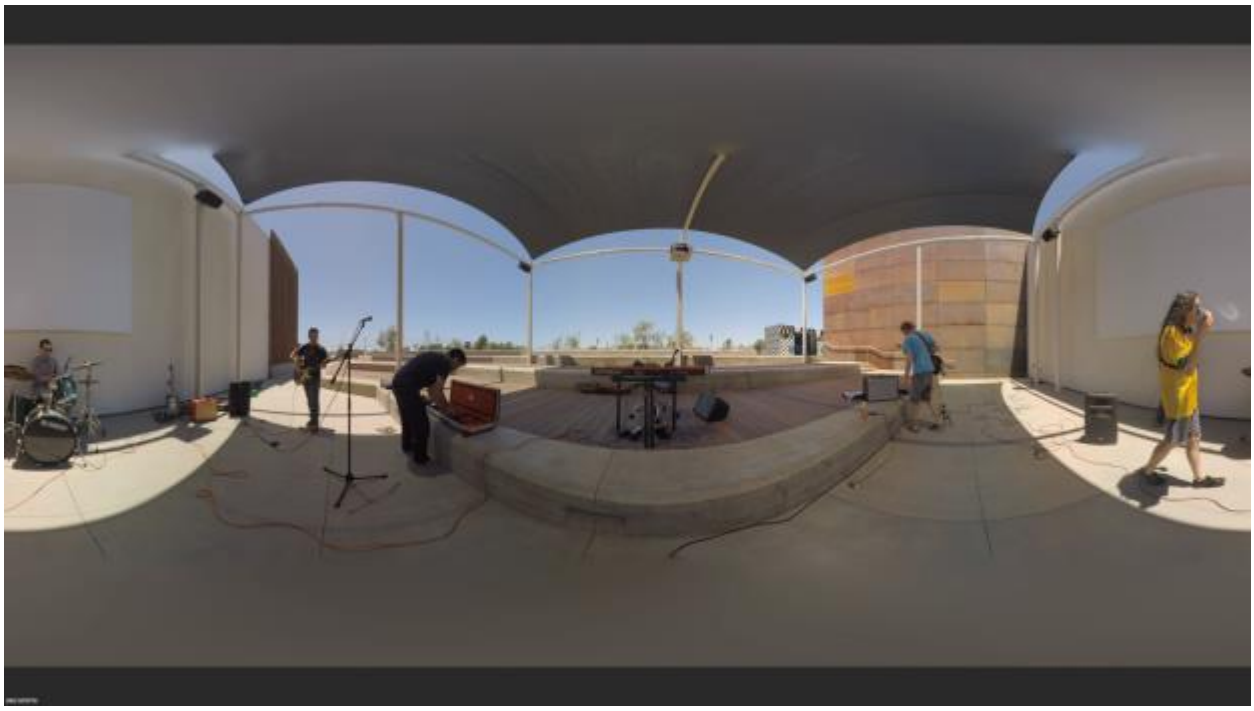
3 Sequence Thumbnails



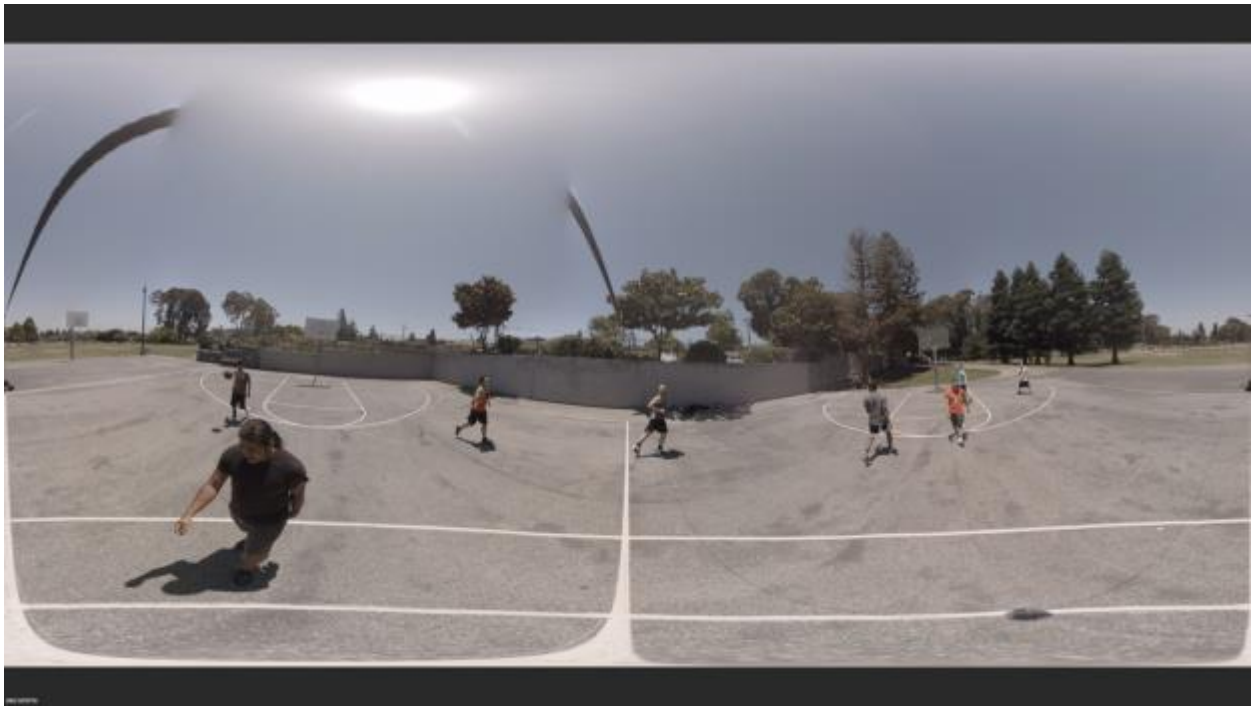
train_le



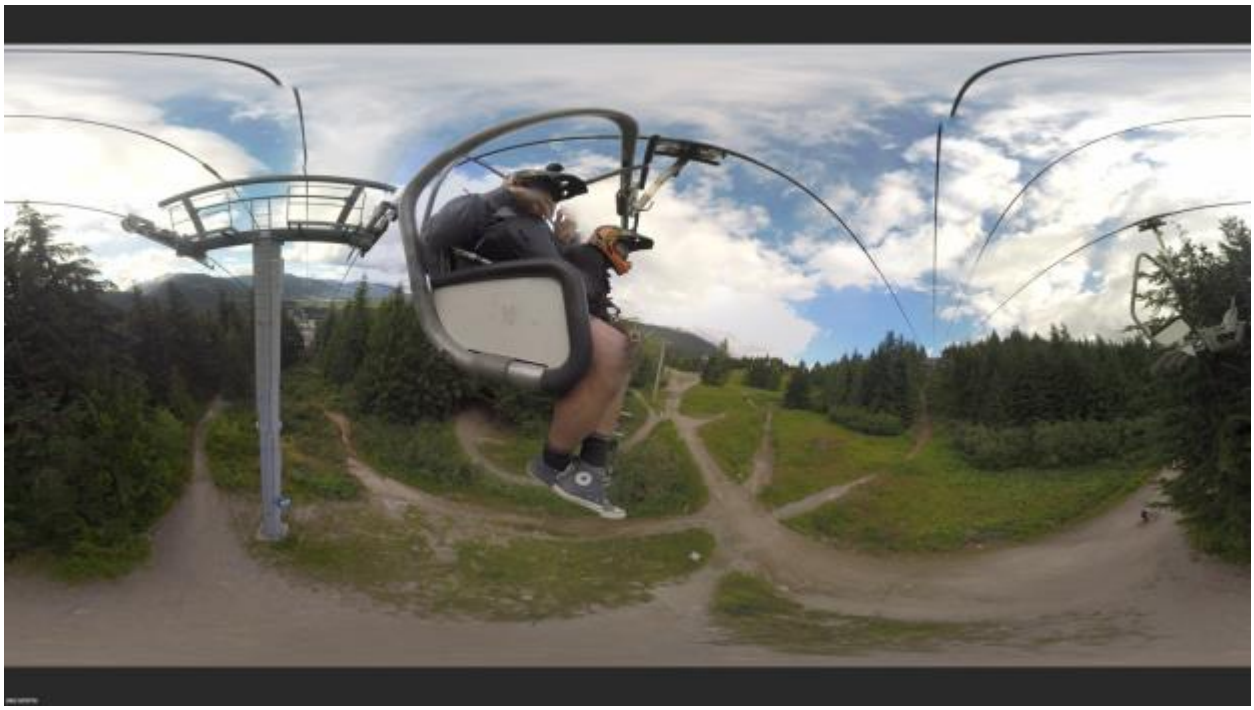
skateboard_trick_le



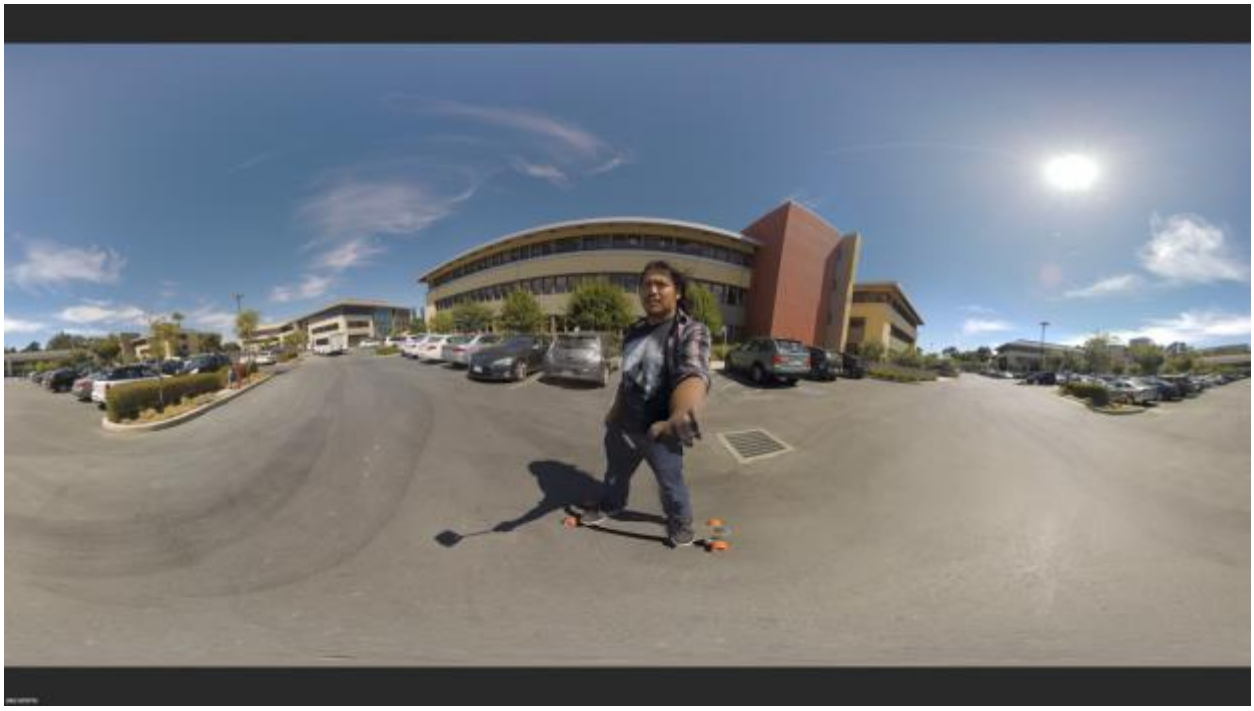
jam_session_le



basketball



chairlift_ride



skateboard_in_lot

4 References

[1] A. Abbas, "GoPro test sequences for Virtual Reality video coding", 54th Meeting: May 2016, Geneva (JVET-C0021)

[2] Y. He, B. Vishwanath and Y. Ye, "InterDigital's projection format conversion tool", 4th Meeting: Chengdu, CN, 15–21 October 2016

5 Sequence Md5Sums

train_le_4096x2048_60Hz_10bit_P420.yuv	5dbf64bdb596c4e325962e840c393575
train_le_8192x4096_60Hz_8bit_P420.yuv	90287c1b8cb03c71973e1e10949f75ad
train_re_4096x2048_60Hz_10bit_P420.yuv	3a20240c69c94ba3c659ac4a8947c535
train_re_8192x4096_60Hz_8bit_P420.yuv	5ae42e209e71eac028142bbb58deed91
skateboard_trick_le_4096x2048_60Hz_10bit_P420.yuv	3a4117475f4825b4db194c21bd5e89e7
skateboard_trick_le_8192x4096_60Hz_8bit_P420.yuv	24029fe5bf03eca813952e2a6c700ba3
skateboard_trick_re_4096x2048_60Hz_10bit_P420.yuv	57c0d4eb4d8dda7f7a3fbb7be2a93d0f
skateboard_trick_re_8192x4096_60Hz_8bit_P420.yuv	68659c0142fd05f329c1b782530e620b

jam_session_le_4096x2048_30Hz_10bit_P420.yuv	57683049be8e306afa91ef006e3e7436
jam_session_le_8192x4096_30Hz_8bit_P420.yuv	664bc78b8086a53a6c855122aad72a6b
jam_session_re_4096x2048_30Hz_10bit_P420.yuv	32930208862e669680c08ef9f4dbfe62
jam_session_re_8192x4096_30Hz_8bit_P420.yuv	cec55032e9594f0942c646353ba755d7
basketball_4096x2048_30Hz_10bit_P420.yuv	fef31663f1ca56c16a5d941d0abca1d4
basketball_8192x4096_30Hz_10bit_P420.yuv	6b00c50efbf9cdc2cdd4bf4501ba8212
chairlift_ride_4096x2048_30Hz_10bit_P420.yuv	beb72d938c2cedd52824e81b88707f76
chairlift_ride_8192x4096_30Hz_10bit_P420.yuv	66a2b36158e726a9c9c825e73d39ee23
skateboard_in_lot_4096x2048_30Hz_10bit_P420.yuv	460696a0049785cf98fa67db76fc6dfd
skateboard_in_lot_8192x4096_30Hz_10bit_P420.yuv	e8eae04c43e959060f641fec4892fced

6 Copyright Information

The sequences provided in this contribution are owned by GoPro.

The following uses are allowed for the proposed sequences:
1. Can be published in technical papers, played at technology research and development events.
2. Can be used by Standards committees. (e.g., SMPTE, ITU, MPEG, VQEG).

The following uses are NOT allowed for the proposed sequences:
1. Do not publish snapshots in product brochures.
2. Do not use video for marketing purposes
3. Do not redistribute video with a commercial product.
4. Do not use in television shows, commercials, or movies.