



CREATING THE LIVING NETWORK™

JVET-J0044

AHG8: Geometry padding for PERP

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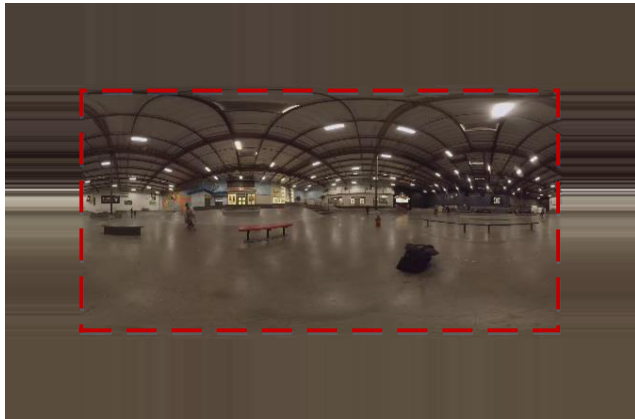
Introduction

- The padded ERP (PERP) format was shown to effectively reduce the seam artifact and was selected as the format used for the 360° anchors
- However, padding and blending may not be sufficient to completely resolve the seam issue, as a seam artifact is still visible in the anchors for the Chairlift sequence
 - Video appears to flicker where face seams occur in the HM and JEM anchors
- This proposal investigates the potential of geometry padding in solving the seam artifact problem observed in PERP

Geometry Padding of Reference Pictures

- Geometry padding extends the reference picture boundaries by considering the 3D geometry
 - Geometry padding pads each face with meaningful neighboring samples in the spherical domain
- Geometry padding for ERP is straightforward
 - Padded samples are simply copied from the reconstructed picture

Repetitive padding



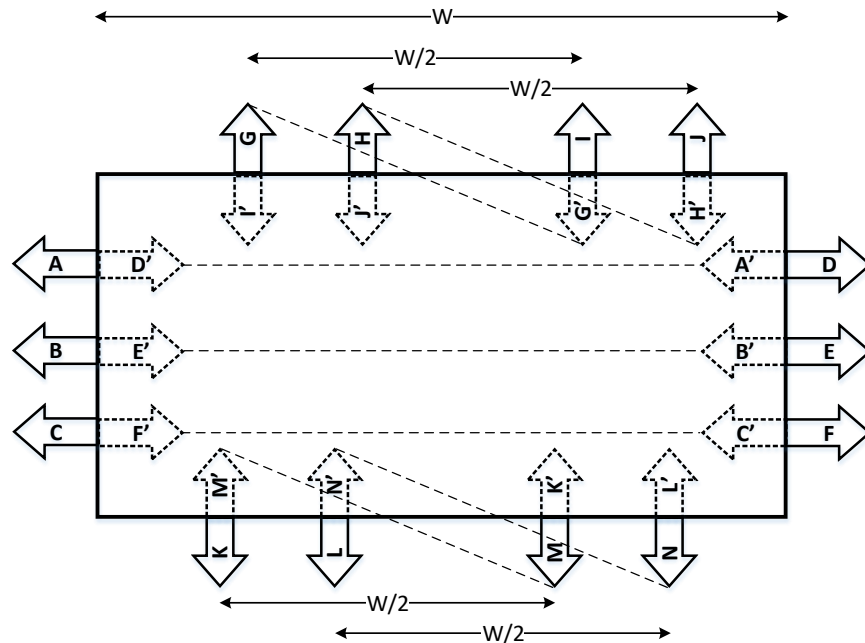
Geometry padding



Geometry Padding for MCP in PERP

Extending a reference picture

1. Blend the reconstructed duplicated samples
 - Same blending method as for post-processing of PERP
 - Blending is moved from post-processing to in-loop
2. Extend the picture with geometry padding using those blended samples at boundaries
 - Only involves a direct copy of samples already available in blended ERP picture



Simulation Results

- Geometry padding implemented based on JEM-7.0 + 360Lib-5.0
- CfP JEM anchor QP settings
- PERP, RA

	E2E WS-PSNR		
	BD-rate(Y)	BD-rate(U)	BD-rate(V)
Balboa	-0.01%	-0.06%	0.16%
Chairlift	-0.98%	-1.44%	-1.33%
KiteFlite	-0.01%	-0.01%	0.13%
Harbor	0.01%	0.09%	-0.06%
Trolley	-0.14%	-0.14%	-0.41%
Average	-0.23%	-0.31%	-0.30%
Enc Time [%]	99%		
Dec Time [%]	106%		

Subjective Quality Evaluation

- PERP
 - Seam artifact is clearly visible for Chairlift
 - Less visible on still images, but particularly objectionable during video playback
- PERP + geometry padding
 - No seam artifact was observed in our expert viewing
 - Geometry padding method resolves the seam artifact issue for Chairlift

Conclusion

- Based on our findings, geometry padding can efficiently resolve the seam artifact for cases where PERP alone is not sufficient
- It is suggested that JVET establish a focused group to explore the benefit of geometry padding for resolving the seam artifact issue
- We would like to request for a viewing session to demonstrate the benefits of geometry padding in resolving the seam artifact issue

THANK YOU!

