



CREATING THE LIVING NETWORK™

JVET-H0049

AhG8: On viewport size and field of view

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Introduction

- After CfE subjective evaluations in Turin, it was suggested that viewports rendered in HD resolution might be more friendly for CfP evaluations
 - Could be displayed directly on a HD monitor without padding
- It was further suggested that viewport resolution and/or FOV may be defined based on coded resolution rather than original ERP
- To investigate these aspects, new mandates were added to AHG8
 - Study the effect of viewport resolution, field of view, and viewport speed/direction on visual comfort
- We generated HD resolution viewports with different FOVs and conducted an informal viewing for sequences included in CfP

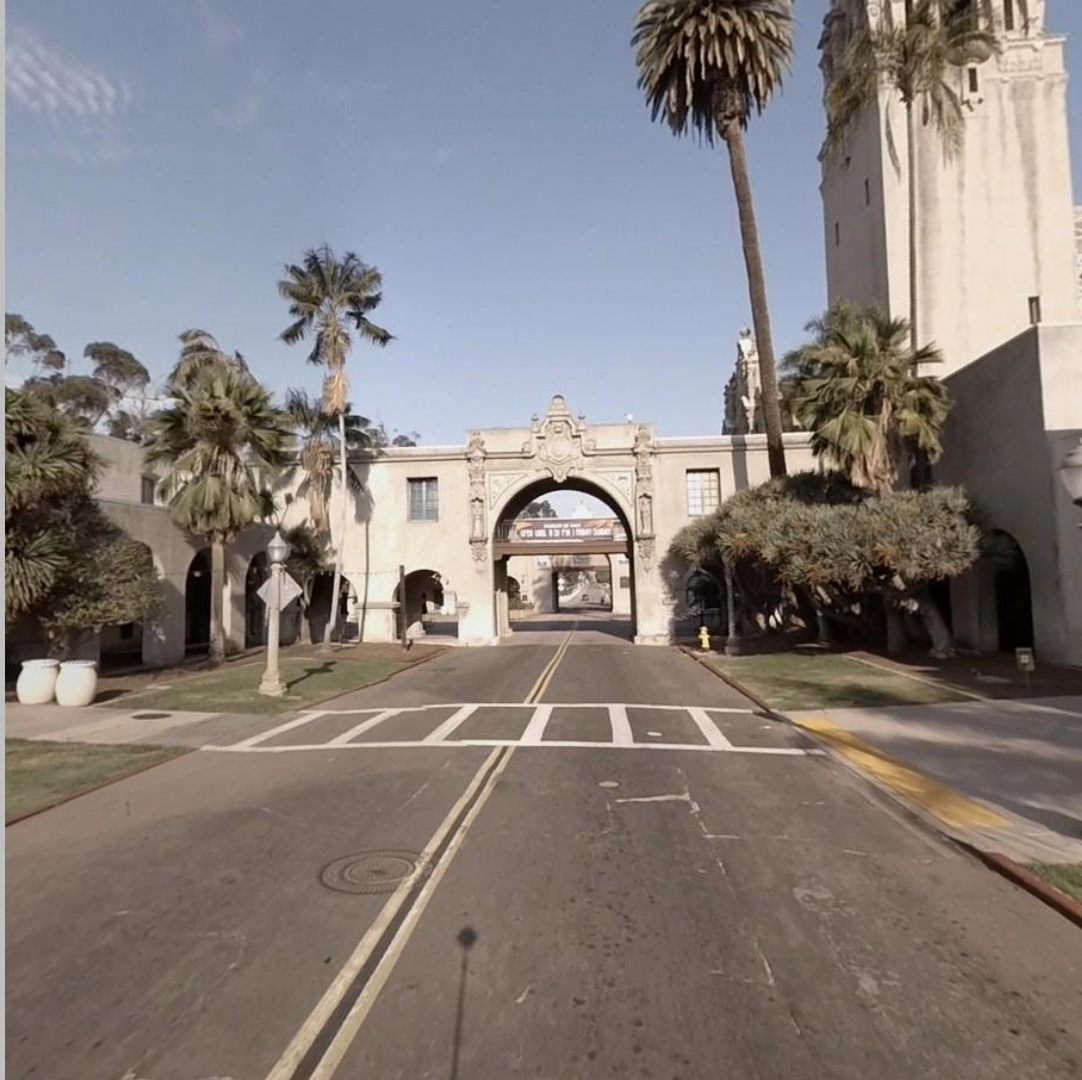
Viewports

$$F = \sqrt{\frac{W \cdot H}{6}} = \frac{W}{2\sqrt{3}} \quad S = F \tan \frac{FOV}{2}$$

- CTC viewports
 - FOV is set to 75×75 degrees
 - Resolution is computed such that a viewport with 90×90 FOV corresponds to the face of a cube having the same number of samples as original ERP sequence
- Investigated viewports
 - HD resolution
 - FOV determined based on: 1) original 8K ERP; 2) coded 4K ERP

| Configuration | Viewport FOV | Viewport resolution | Number of samples on a cube |
|---------------|--------------|---------------------|-----------------------------|
| CTC | 75×75 | 1816×1816 | Same as 8K ERP |
| HD1 | 78.1×49.1 | 1920×1080 | Same as 8K ERP |
| HD2 | 116.7×84.8 | 1920×1080 | Same as 4K ERP |

Balboa
CTC
1816×1816
75×75



Balboa

HD1

1920×1080

78.1×49.1

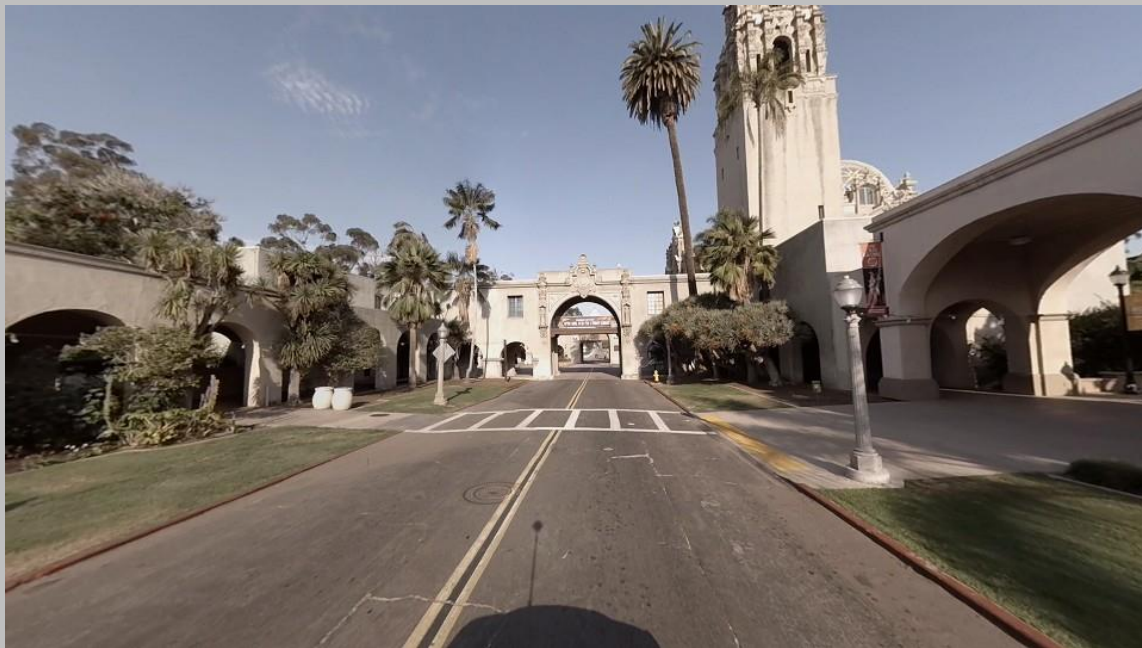


Balboa

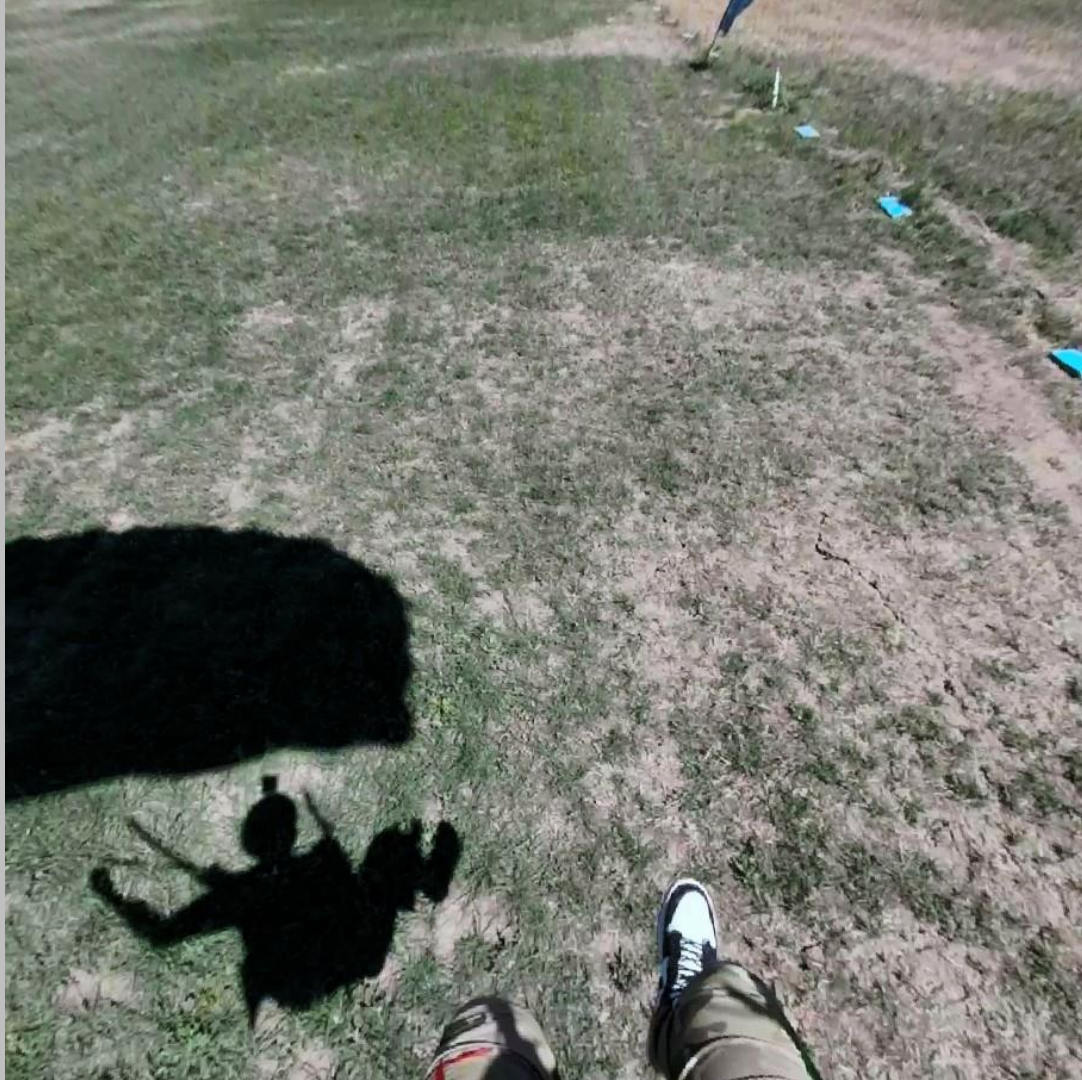
HD2

1920×1080

116.7×84.8



Landing
CTC
1816×1816
75×75



Landing

HD1

1920×1080

78.1×49.1



Landing

HD2

1920×1080

116.7×84.8



Discussion

- 78.1×49.1 FOV (HD1)
 - Very similar to CTC viewports
 - Horizontal FOV slightly larger, but difference is not noticeable and rectilinear distortions are rather small
 - Vertical FOV is reduced → vertical coverage is lower compared to CTC viewports
 - Do not introduce visual discomfort compared to CTC viewports
- 116.7×84.8 FOV (HD2)
 - Strong stretching at left and right sides due to rectilinear projection
 - Causes objects on the sides to appear to have a higher motion
 - Significantly increase visual discomfort for dynamic viewports and moving content
 - Forces focus more toward the center → unable to take full advantage of whole resolution

Conclusion

- Two HD viewport configurations were investigated: 78.1×49.1 FOV and 116.7×84.8 FOV
- 78.1×49.1 FOV is recommended because 116.7×84.8 FOV significantly increase visual discomfort
- We would like to request for a viewing session to show the generated viewports

THANK YOU!

