



AHG9: On the Proposed Multiplane Image Information SEI Message

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JVET-AF0167

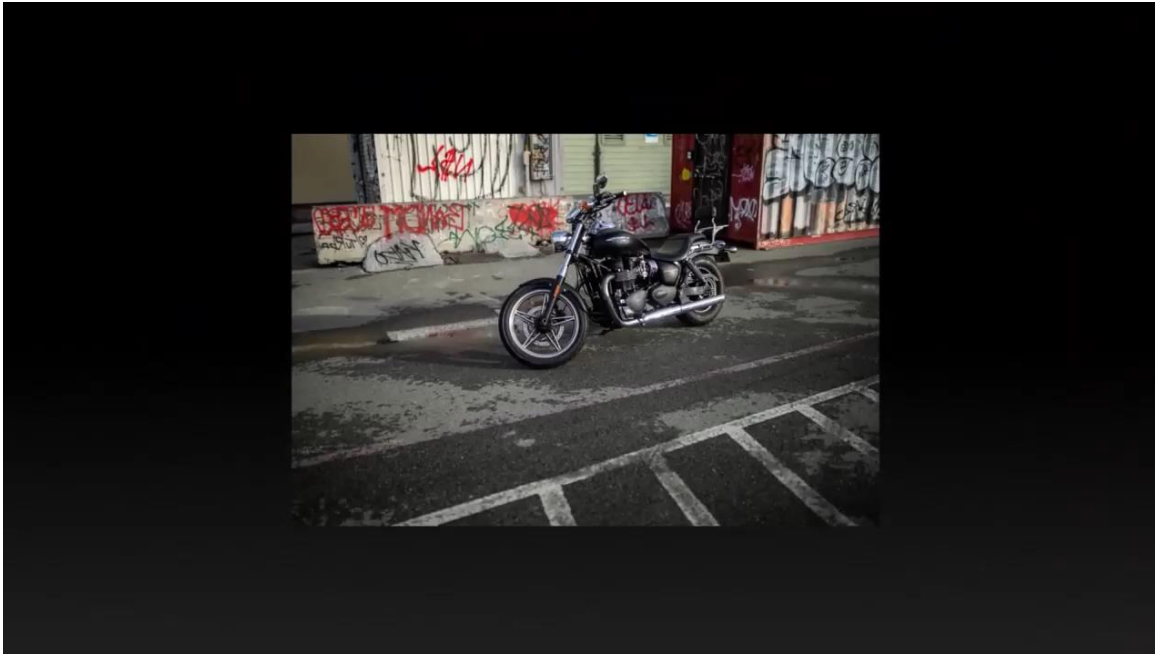
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Outline

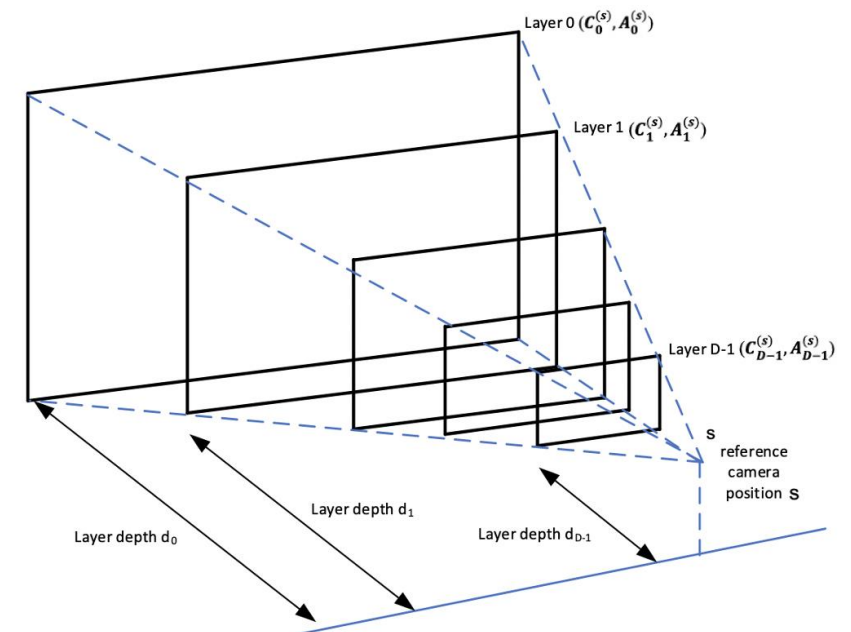
- Proposed multiplane image information SEI
- Conclusions

Multi-Plane Image (MPI)

- A volumetric scene representation using multiple layers of RGBA images.
- Computationally efficient novel view rendering with state of art view synthesis performance
- Enable new viewing experiences using existing image/video transmission infrastructures and viewing devices.



"Local Light Field Fusion: Practical View Synthesis with Prescriptive Sampling Guidelines", Siggraph 2019



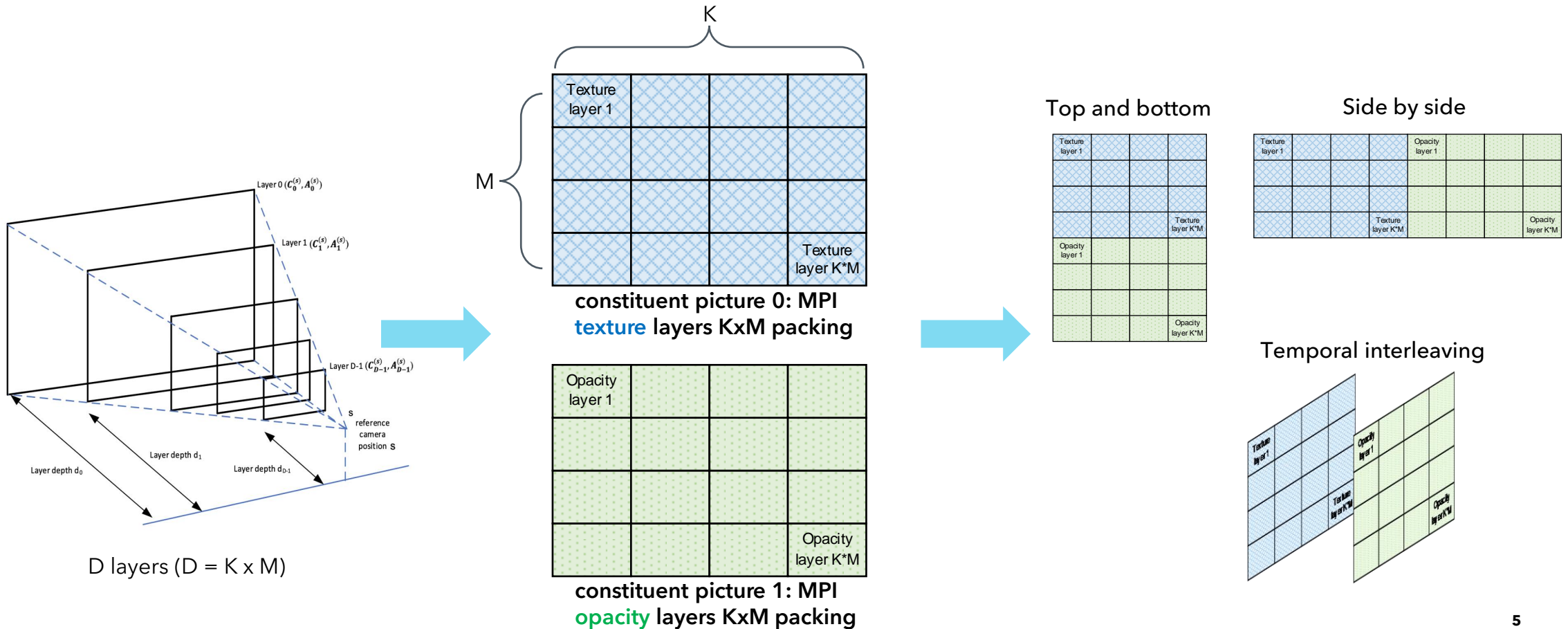
layers are shown in perspective projection.
they are essentially the same size

MPI Information SEI: design philosophy

- To create a container/carrier for the MPI based volumetric representation
 - Design method to pack high-dimensional volumetric data into “conventional” 2D video
- To enable distribution of this “container” with existing video distribution infrastructure.
 - Provide the minimal set of metadata for MPI restoration

MPI layer packing and arrangement

- MPI texture and opacity layers are first spatially packed by $D=K \times M$ arrangement to form constituent pictures
- two constituent pictures can be packed by different options



MPI Information SEI: syntax and semantics

	Descriptor
multiplane_image_information(payloadSize) {	
mpii_num_layers_minus1	ue(v)
mpii_layer_depth_equal_distance_flag	u(1)
if(mpii_layer_depth_equal_distance_flag) {	
depth_rep_info_element(ZNearSign, ZNearExp, ZNearMantissa, ZNearManLen)	
depth_rep_info_element(ZFarSign, ZFarExp, ZFarMantissa, ZFarManLen)	
} else	
for(i = 0; i <= mpii_num_layer_minus1; i++)	
depth_rep_info_element(ZSign[i], ZExp[i], ZMantissa[i], ZManLen[i])	
mpii_texture_opacity_interleave_flag	u(1)
if(mpii_texture_opacity_interleave_flag == 0)	
mpii_texture_opacity_arrangement_flag /* 0: TaB, 1:SbS */	u(1)
mpii_frame_num_layers_in_height_minus1	ue(v)
}	

Layer depth related:
depth_rep_info_element() has exact same definition as in DRI SEI (ITU-T Rec. H.274 clause 8.22.1.1)

Layer packing & arrangement related

- Syntax and semantics remain the same as in JVET-AE0066.
- Software implementation on VTM22.0 are ready and crosschecked (all three packing options), which includes the completed syntax signaling, parsing and MPI de-packing as described in semantics.

Conclusion

- MPEI SEI message provided the minimal set of metadata for distribution of single-view MPI content with single conventional 2D decoder
- We propose to adopt MPEI SEI into VSEI
 - Software is ready for VTM and crosschecked - Thanks Alibaba for crosschecking