

Terms for MPEG-Immersive 3DoF+ Standard Work

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Contributions on 3DoF+

- ❖ w17726 - Common Test Conditions (CTC) on 3DoF+
- ❖ w17759 - Reference View Synthesizer (RVS) manual
- ❖ w17760 - ERP WS-PSNR software manual
- ❖ m43504 – Outperforming 3DoF+ anchors: first evidence
- ❖ w17761 - 3DoF+ software platform description
- ❖ w17724 - Draft call for proposals on 3DoF+

Common Test Conditions (CTC) on 3DoF+

- ❖ Common Test Conditions (CTC)
 - Conditions for the experiment including parameters for the test sequence
- ❖ Test sequence
 - Test materials used in the experiment
 - In 3DoF+, 3 test sequences are provided



Class A

ClassroomVideo (4096x2048), 360° x 180° FOV ERP, 30fps, 120frames, 15 source views



Class B

TechnicolorMuseum (2048x2048), 180° x 180° FOV ERP, 30fps, 300frames, 24 source views



Class C

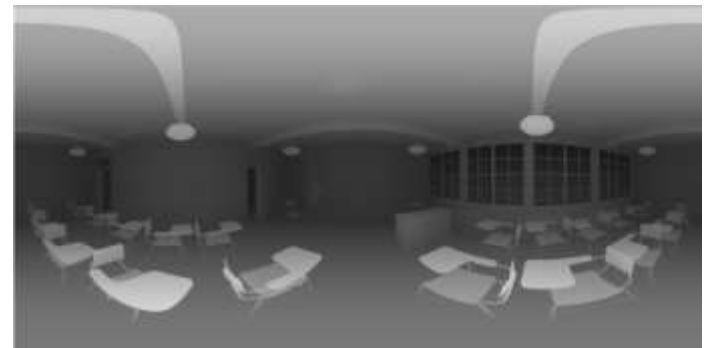
TechnicolorHijack (4096x4096), 180° x 180° FOV ERP, 30fps, 300frames, 10 source views

Common Test Conditions (CTC) on 3DoF+

- ❖ Texture
 - Made of picture which contains the color information
- ❖ Depth
 - Represents the distance between the camera and the objects shown in texture
- ❖ Source view
 - Video provided by the test sequence, includes both texture and depth
- ❖ Intermediate view
 - Video which is not provided by the test sequence
 - Virtually synthesized from source views



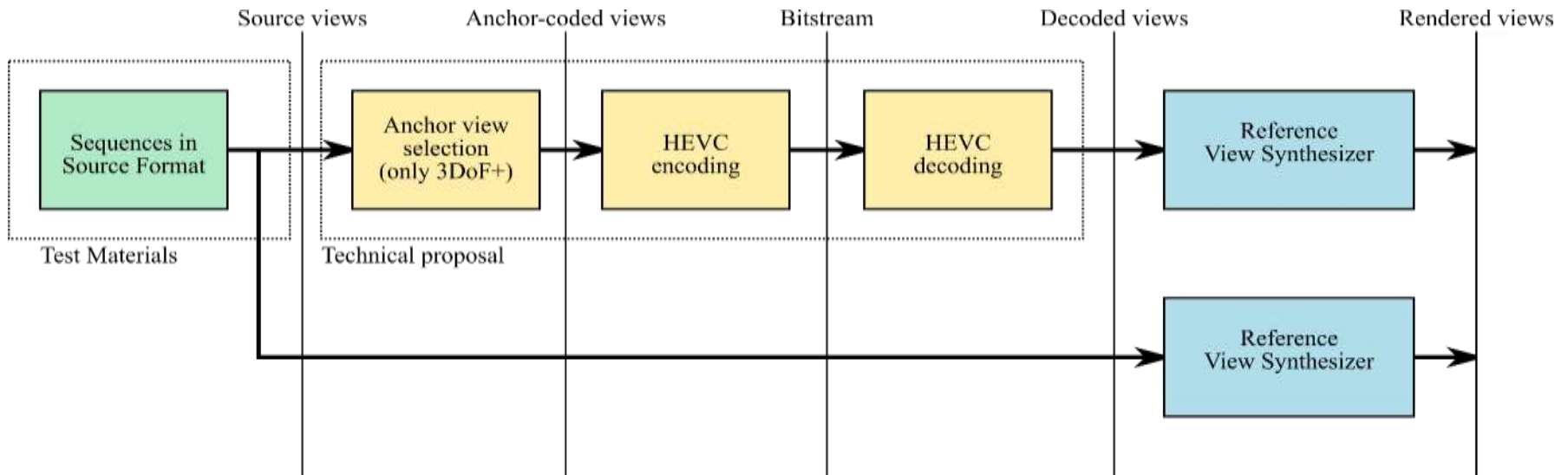
Texture of ClassroomVideo



Depth of ClassroomVideo

Common Test Conditions (CTC) on 3DoF+

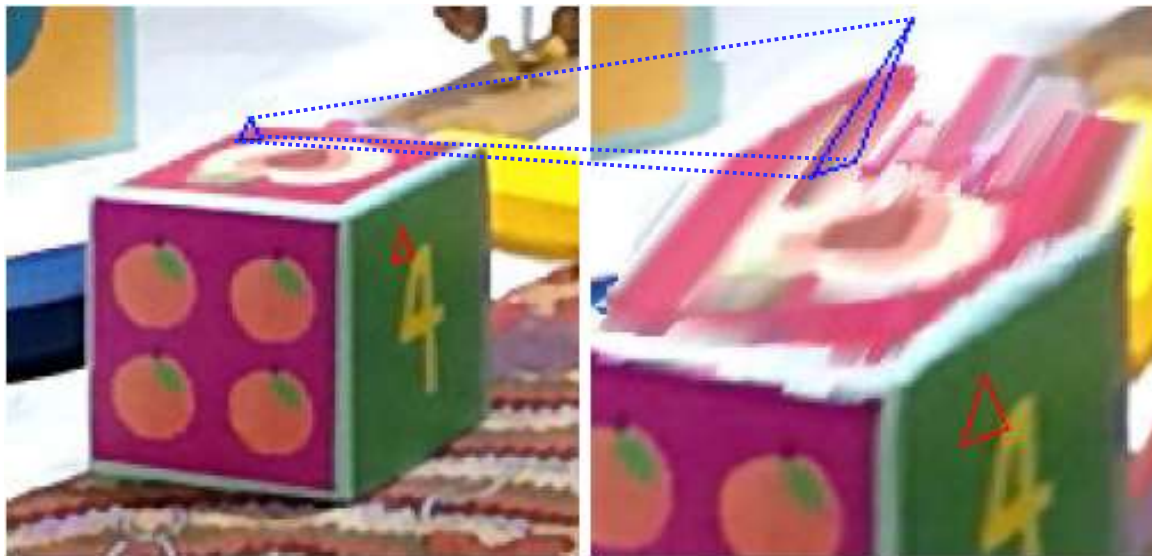
- ❖ Non-coded source view
 - A view generated from anchor view whose position is one of the source view
- ❖ Anchor view
 - A subset of source views to be used in view synthesis
 - In 3DoF+, it is encoded and decoded with HEVC



Definition of the anchor

Reference View Synthesizer (RVS) manual

- ❖ Reference View Synthesizer (RVS)
 - Software used to synthesize a view in 3DoF+
- ❖ 3D warping
 - Pixel movement between viewpoints of the same world coordinates

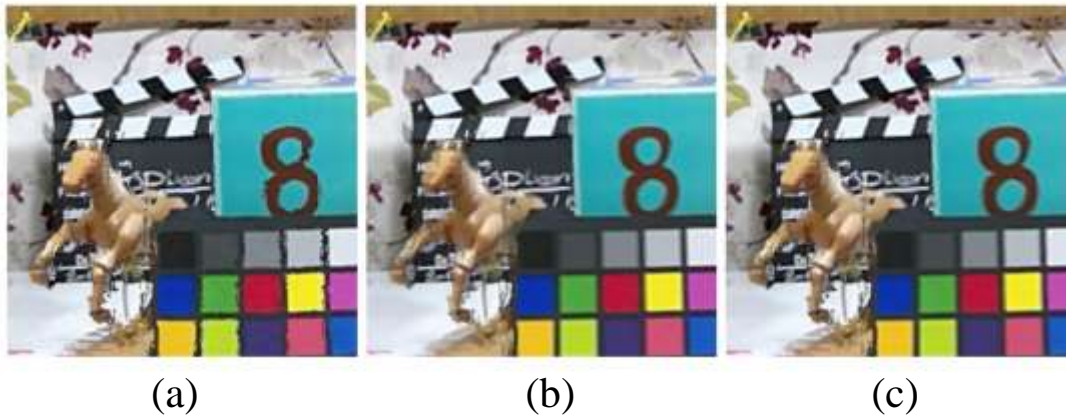


(a) Input view

(b) Obtained view after synthesizing
view and depth

Reference View Synthesizer (RVS) manual

- ❖ View blending
 - Blending all of the synthesized images
- ❖ Hole
 - Area of the synthesized view which did not filled by the source views
- ❖ Inpainting
 - Filling the hole with the nearest pixel



(a): Blending by argmax

(b): Weighted mean

(c): Multi-spectral blending: argmax - high frequencies

weighted mean - low frequencies

ERP WS-PSNR software manual

❖ WS-PSNR

- Uniform weight in sphere PSNR
- Designed to evaluate the coded omnidirectional video



Weight map of WS-PSNR

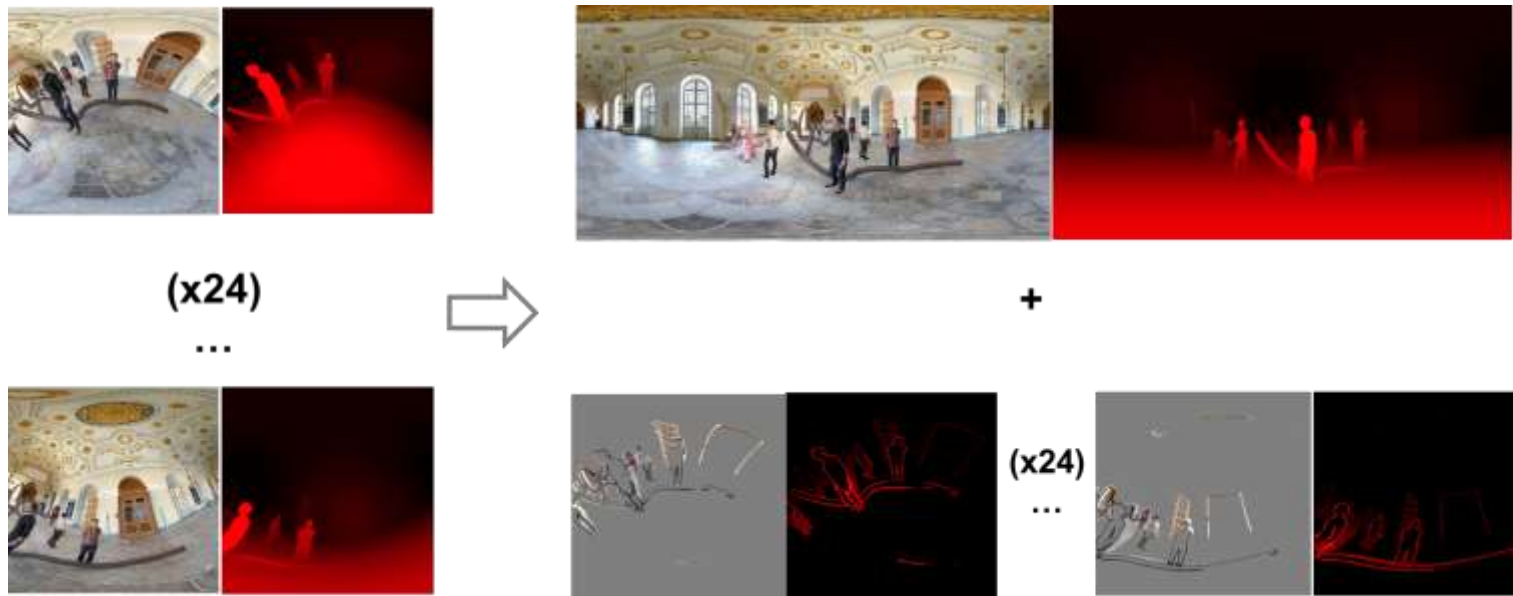
Outperforming 3DoF+ anchors: first evidence

❖ Central view

- A view which contains most of the information of the source views
- The position of the central view is the most frequently used position

❖ Sparse view

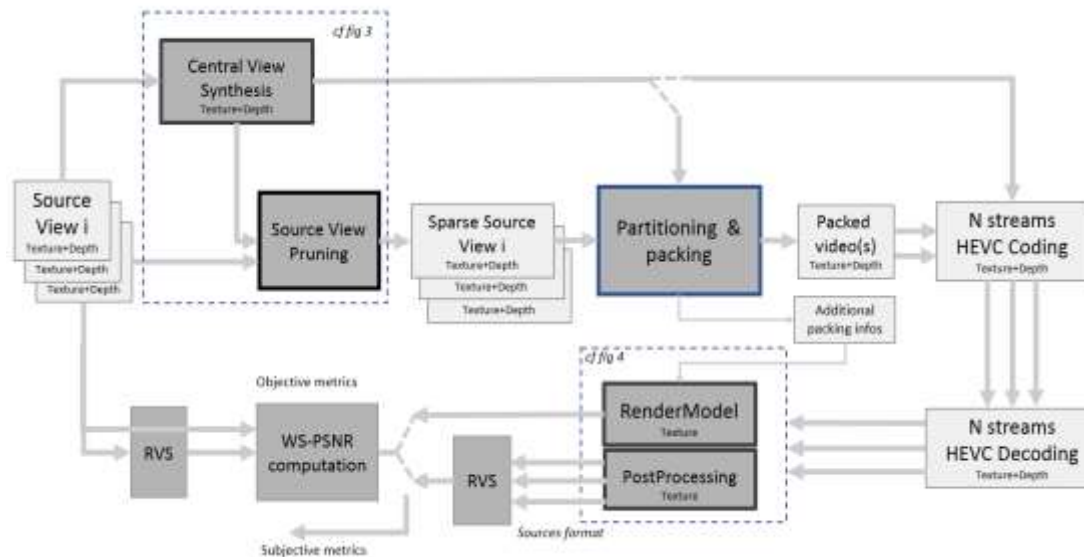
- A view only carries a particular information of its own
- Generated by removing redundancy between source views and central view



Visualization of the central view and the source views

3DoF+ software platform description

- ❖ Source view pruning
 - Generates the sparse view with the central view and the source views
 - Removes the pixels which the central view already contains
- ❖ Partitioning & packing
 - Divides the sparse views and discard the empty spaces
 - Merges all of the partitions and generates additional information



3DoF+ software platform description

Draft call for proposals on 3DoF+

- ❖ Viewport
 - A rectangular image which the user sees
 - Has a field of view of $90^\circ \times 90^\circ$, rectilinear projection format
- ❖ Pose trace
 - Information about the user's viewport