360° Videos and the Cloud

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Pixvana

Multiple Lens/Sensors for full 360 coverage

6 GoPro VR Mono Rig
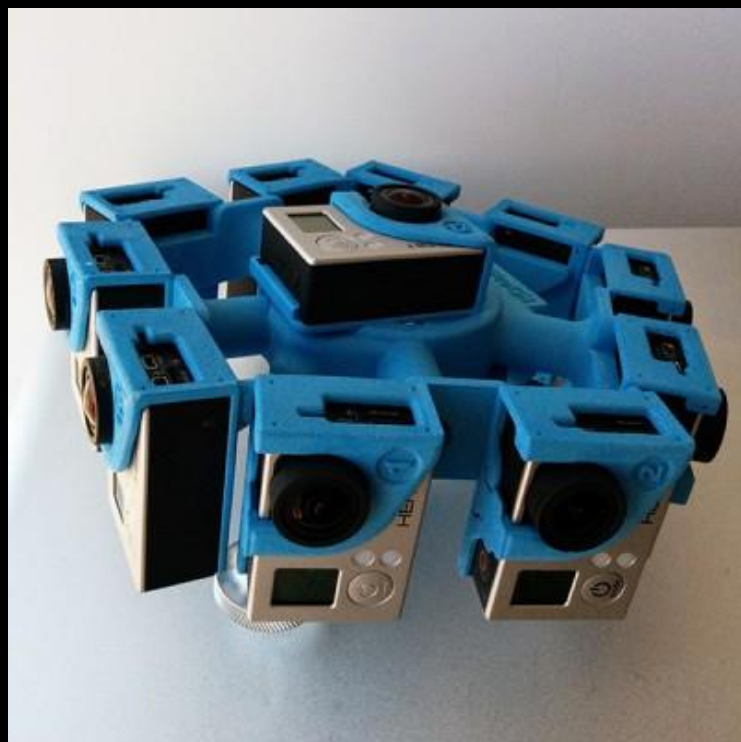
6 Reds VR Mono Rig
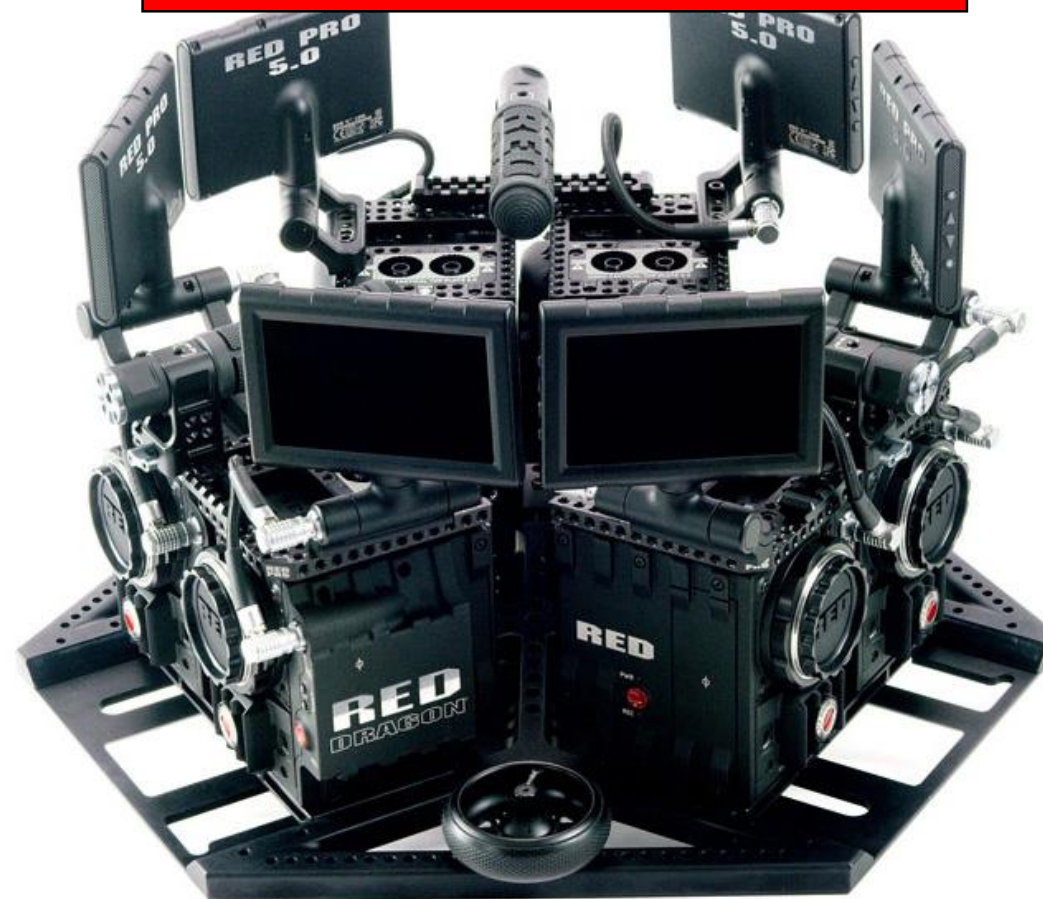
Stereo VR Rigs

12 GoPros (5 x Pairs, 1 up 1 down)

6 Reds (3 x Pairs)

Computational Stereo Cameras

Source Material

- 6 to 24 digital cameras
- Shooting 30-60 fps
- Greater than HD quality, up to 6-8k per camera
- Large data uploads

Stitching

Stitched together to make 4k (to 16k) video using computation photography and vision algorithms (feature detection, optical flow, stereo generation, warping) All compute intensive processing.

Jaunt, Google, Pixvana

Post-Production

These special format large videos have to be edited, color corrected and other tasks. Efficient on the cloud.
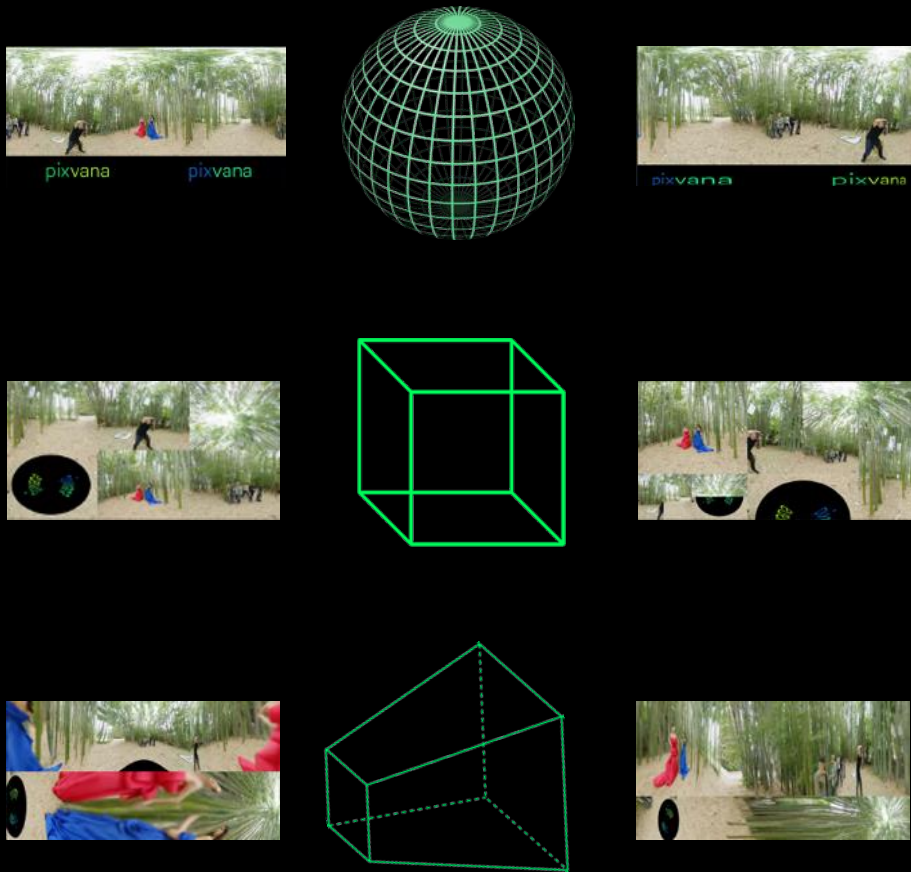
Distribution

Current streaming and playback of 360 Videos for headsets is limited to 4k. Entire 360 video image is streamed but viewer is only seeing 90-110 degrees.
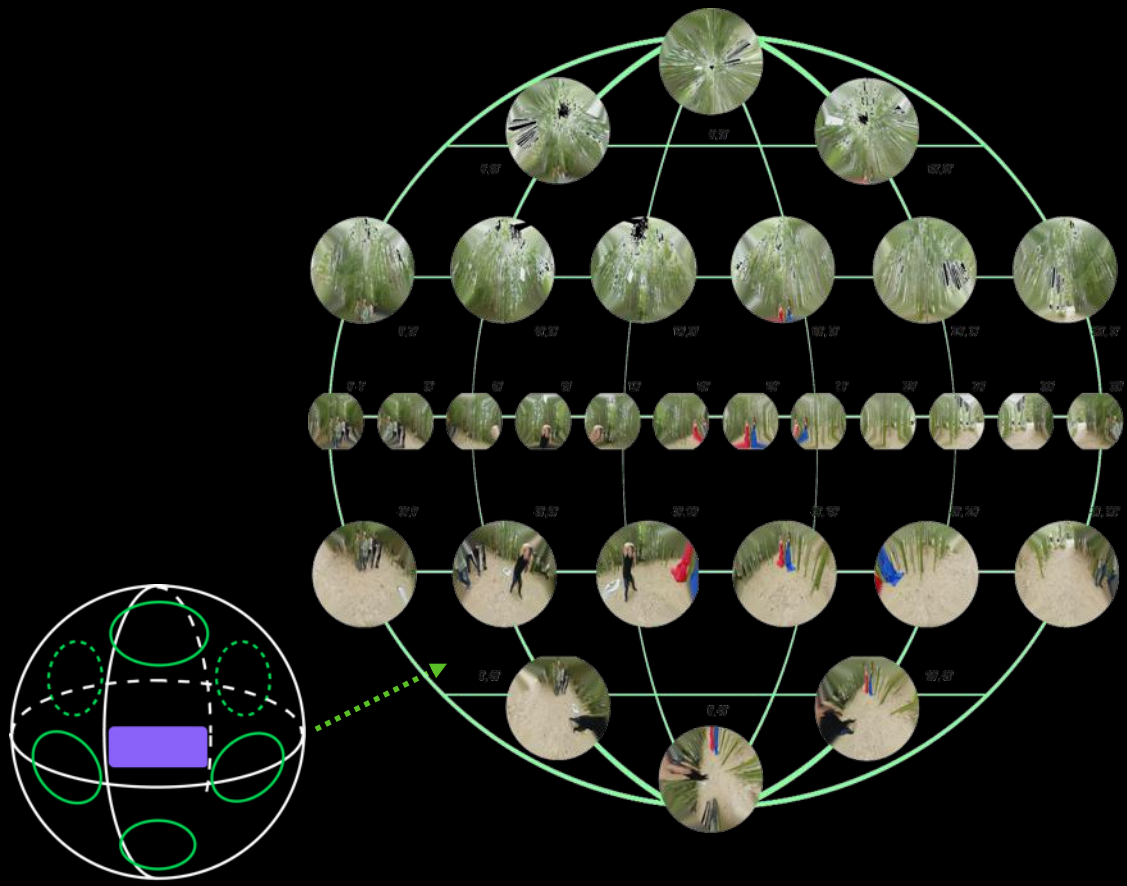
Wasted bits and lower quality than what the headsets can provide. Especially in stereo.

FOVAS Method

Viewboxes A projection through which a viewer perceives a video stream in Virtual Reality

Viewports A individual video stream that is optimized for a given field-of-view within the entire spherical video

Tiling / Transcoding

Final video is specialty processed to represent multiple viewports (or tiles) A typical number of viewports is 30. Then each of these are encoded with different bit rates. Copied to a CDN for playback on specialty players for the headsets.

OPF is an Open Standard to deal with these concepts.

Future

- 360 video processing will become more complex
- Volumetric and Depth Capture
- Light Fields for capture and processing