Point Cloud Compression in MPEG

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Visual capture



ELECO

Visual capture





LDR, HDR





Multi-camera

HD, Full HD, 4K, 8K



Stereoscopy





Visual synthesis

PX vs PC

ELECON SudPari

Visual capture

Geometric primitives















Point Cloud

- A set of 3D points
 - not ordered,
 - without relations between them

- Each point is defined by
 - (X, Y, Z)
 - (R, V, B) or (Y, U, V)
 - reflectance, transparency, ...













800,000 points -> 1 000 Mbps (uncompressed)



Compression is required in order to make PC useful



Point Cloud Compression

- MPEG initiated the work on PCC in 2014
- In April 2017 MPEG issued a Call for Proposals on PCC









Point Cloud





Point Cloud



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Point Cloud Compression





Main outcome

Decomposition of PC into 2D patches



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MPEG PCC v0

800,000 points -> 1 000 Mbps (uncompressed)



800,000 points -> 8 Mbps (MPEG PCC 2017)



Conclusion

- State-of-the-art point cloud compression can be significantly improved by leveraging decades of 2D video coding technology development
- By combining 2D and 3D compression technologies, PCC provides synergies with existing hardware and software infrastructure for rapid deployment of new immersive experiences
- MPEG PCC is a solid basis for the next few decades in 3D graphics compression





We are at the beginning of a new era when humanity will re-gain its third dimension!







Several pictures and videos used in this presentation are provided by 8i (https://8i.com/)

