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Multi-Wavelength Encoding for 3D Range Data Compression

This method enables 3D imaging data to be highly compressed into 2D image formats, allowing for easier, more efficient transport and utilization of 3D files while reducing computational load and battery usage.

Data associated with 3D imaging technologies is cumbersome when saving or streaming files over the internet due to their relatively large file size per frame. Transfer and utilization of these files increases battery usage, computational requirements, memory usage, and reconstruction time. In addition, despite these inefficiencies, the files must be reconstructed beyond the scope of the original file to adjust for errors. However, 3D range geometry compression allows these files to be encoded as highly compressed images. Techniques such as this will allow for easier transport and utilization of 3D imaging files.

Researchers at Purdue University have developed a method of 3D range geometry compression, allowing 3D imaging data to be multi-wavelength encoded on 2D PNG or JPEG images and compressed. This method is extremely accurate by maintaining high reconstruction accuracies. In addition, there is a low 3D reconstruction error percentage with minuscule post processing requirements. Representing the 3D image through either a z map or an s map creates a highly compressed file capable of being stored on devices or streamed over the internet. A lower level of post-processing lessens battery usage, computational requirements, memory usage, and reconstruction time.

Advantages:

-Small file size

-High reconstruction accuracy

-Cost effective

Potential Applications:

Technology ID
2016-ZHAN-67327

Category
Artificial Intelligence & Machine Learning/3D Optical Imaging & Industrial Metrology

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View online

-Distribution of 3D data

-Saving of 3D data

TRL: 3

Intellectual Property:

Provisional-Patent, 2015-12-02, United States

Utility Patent, 2016-12-02, United States

CON-Gov. Funding, 2020-03-23, United States

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Keywords: 3D range geometry compression, 3D imaging, file compression, multi-wavelength encoding, 2D PNG compression, 2D JPEG compression, high reconstruction accuracy, low 3D reconstruction error, compressed 3D data, streaming 3D data, 3D Imaging, Computer Technology, Image Processing, Imaging, Mechanical Engineering