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A Simple Algorithm for Real-Time 3D Capturing of an Interior Scene Using a Linear Voxel Octree and a Floating Origin Camera

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Abstract : We present a simple algorithm for capturing a 3D scene (focused on the usage of mobile device cameras in the context of augmented/mixed reality) by using a floating origin camera solution and storing the resulting information in a linear voxel octree. Data is derived from cloud points captured by a mobile device camera. For the purposes of this paper, we assume a scene of fixed size (known to us or determined beforehand) and a fixed voxel resolution. The resulting data is stored in a linear voxel octree using a hashtable. We commence by briefly discussing the logic behind floating origin approaches and the usage of linear voxel octrees for efficient storage. Following that, we present the algorithm for translating captured feature points into voxel data in the context of a fixed origin world and storing them. Finally, we discuss potential applications and areas of future development and improvement to the efficiency of our solution.

Keywords : voxel, octree, computer vision, XR, floating origin
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