A 3D SYMBOLOGY PROPOSITION FOR BUILDING INTERIORS BASED ON A RGB-D SENSOR MODELING APPROACH

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This research on 3D symbology for building interiors is based on the use of the RGB-D sensor Microsoft® Kinect to collect depth and color data of an indoor environment. The goal of this research is to evaluate how the visual variables, such as color and texture, in conjunction with the visual aspects of illumination, shading, perspective and camera position, can affect the representation of symbolized 3D indoor environments. The main advantages of the Kinect sensor are its portability, the capacity of capturing depth and color data at once, and its relatively low cost when compared with concurrent technologies such as laser scanner or *Time-of-Flight* cameras. We have considered a state-of-the-art photogrammetric technique to capture indoor data as a multi-dimensional point cloud containing information of the scene. This point cloud is then processed using computer vision algorithms to create a 3D model of the interior by having its structural planes detected, identified and classified under one of the three following categories: ceiling, wall or floor. To properly classify the planes, its normal vectors are calculated to establish their parallelism or perpendicularity conditions. These planes are then adjusted as a cube to configure a common architectural model of a room. The output format of the cubic model has to be compatible with the Trimble® SketchUP software which is going to be used for the evaluation of the visual variables and visual aspects that altogether are the essence of the 3D symbology proposition. The idea is to create several representations of the symbolized indoor environment, all of them with different parameters, in order to judge which one is more suitable for representing the indoor scene. Currently this research is running the phase of evaluation of the variables. We consider our work to be a valuable contribution to the research area on 3-dimensional mapping.

Keywords: 3D symbol, indoor representation, RGB-D sensor.