

Applying Multiple Kinect on the Development of a Rapid 3D Mannequin Scan Platform

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Abstract : In the field of reverse engineering and creative industries, applying 3D scanning process to obtain geometric forms of the objects is a mature and common technique. For instance, organic objects such as faces and nonorganic objects such as products could be scanned to acquire the geometric information for further application. However, although the data resolution of 3D scanning device is increasing and there are more and more abundant complementary applications, the penetration rate of 3D scanning for the public is still limited by the relative high price of the devices. On the other hand, Kinect, released by Microsoft, is known for its powerful functions, considerably low price, and complete technology and database support. Therefore, related studies can be done with the applying of Kinect under acceptable cost and data precision. Due to the fact that Kinect utilizes optical mechanism to extracting depth information, limitations are found due to the reason of the straight path of the light. Thus, various angles are required sequentially to obtain the complete 3D information of the object when applying a single Kinect for 3D scanning. The integration process which combines the 3D data from different angles by certain algorithms is also required. This sequential scanning process costs much time and the complex integration process often encounter some technical problems. Therefore, this paper aimed to apply multiple Kinects simultaneously on the field of developing a rapid 3D mannequin scan platform and proposed suggestions on the number and angles of Kinects. In the content, a method of establishing the coordination based on the relation between mannequin and the specifications of Kinect is proposed, and a suggestion of angles and number of Kinects is also described. An experiment of applying multiple Kinect on the scanning of 3D mannequin is constructed by Microsoft API, and the results show that the time required for scanning and technical threshold can be reduced in the industries of fashion and garment design.

Keywords : 3D scan, depth sensor, fashion and garment design, mannequin, multiple Kinect sensor

Conference Title : ICAMAME 2016 : International Conference on Aerospace, Mechanical, Automotive and Materials Engineering

Conference Location : Prague, Czechia

Conference Dates : July 07-08, 2016