Low-cost virtual reconstruction and visualization of historical objects with focus on blind people using 3D printer

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Abstract

Many articles discuss problems of modern virtual museums and related technologies. Today, we are able to reconstruct any object if we have some metric information's about it. Of course, there are a lot of objects without relevant information's – for example objects that are only cited in old literature. These objects can be reconstructed only on the base of artistic and scientist visions. This contribution deals with non-expensive virtual reconstruction possibilities based on close- range photogrammetry and 3D printing using rapid prototyping technology. Nowadays we can use many software for 3D animation; some of them are very sophisticated with a very nice outputs. Metric information's (profiles, distances etc.) are not usually included in the outputs. This is the main disadvantage – in many cases we have got very nice graphically perfect rotated objects only. Rapid prototyping technology was intensively developed in the last decade. It needs 3D metric information about printed object. Thanks to low-cost and easy-to-use technology we are able to produce scaled 3D virtual models or real prints, which can be included to objects in any virtual museum. For blind people it is a perfect possibility to better visualize any objects. Our paper is focused on a case project between Laboratory of photogrammetry and East-Bohemia museum in Pardubice. Some objects were scanned and documented using free software and other photogrammetrical solutions (Photomodeler, Agisoft). Created 3D virtual models were printed on 3D printer and were also added to the web page. In the future, we will connect objects on web page with new type of control (like voice control or capture of brain waves); it will be necessary for blind people or for children. Technological steps based on low-cost technology and outputs accuracy are discussed in this paper.