

Digital Processing of 3D Full Body Scans for 3D Printing

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Abstract

We present a cloud based solution for automated processing of 3D full body scans into 3D printable figurines. Digital representations of the outer surface of human beings have many different applications. One popular application is the physical production of 3D printed figurines. However, a raw 3D scan is not necessarily 3D printable, and if it is, it might be too fragile to be practically useful. Furthermore, straightforward printing of a scan on a state-of-the-art 3D color printer is not desirable due to the considerable color differences between the digital model and the physical reproduction. Therefore, pre-print processing is recommended. Manually performing these tasks requires specialized knowledge, software and a substantial amount of time. We automate these tasks and offer them as a cloud service in order to reduce processing time as well as financial costs.

In order to produce a decent 3D color print starting from a 3D scan, several types of processing are needed. We distinguish between (a) color corrections, (b) thickening thin components, (c) clutter and floor removal, (d) creating a watertight mesh, (e) adding a sufficiently stable baseplate, (f) rotate the scan so that the face looks into the right direction, (g) smoothing the full scan except for the face (h) optionally hollowing the scan and drilling escape holes and (i) some other trivial tasks such as scaling and rotating the scan. For each of the challenges mentioned, we present a fully automated solution to the problem.

Currently we cannot solve issues such as non-trivial missing parts in the scan and incorrect color reprojections in the texture. In the future we will investigate on how to solve some of the issues by taking a machine learning approach on a large database of manually corrected scans.

Keywords: 3D printing, Automated, Processing, 3D Full Body Scan, Cloud

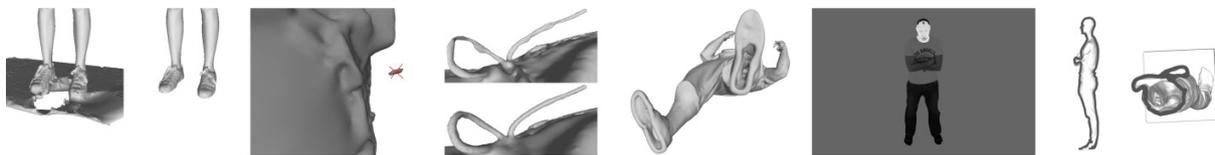


Figure 1: Selection of digital 3D pre-print processing modules. From left to right: floor removal, clutter removal, thickening thin components, hollowing the solid mesh, rotating scan face forward and baseplate integration.