

3D Copy&Paste: A Photogrammetry solution for 3D scanning of salient objects

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Current 3D scanning solutions for single objects with hand-held devices require a high level of technical knowledge and expensive external devices. An alternative solution is to generate 3D models from images taken on a phone. This is known as Photogrammetry, which is a tedious process often done manually. It also incorporates unwanted background data to the 3D reconstruction of the model.

This dissertation presents an end-to-end 3D scanning solution which automates Photogrammetry with a mobile device. The solution comprises three interconnected modules. First, a mobile application, called "3D Copy&Paste", is used to obtain images from the camera sensor of the phone. A server then automatically removes the background from the input images using deep-learning based salient object detection, the resulting images are then used to generate a 3D object using Photogrammetry. Finally, an add-on for a desktop 3D software is able to import the generated model seamlessly.

3D models of single objects without background were generated at least 30% faster with the tested Photogrammetry pipeline. Also, with an average of 96% scale accuracy, this solution provides faster and lower cost 3D scanning in mobile devices with similar quality to the State of the Art. The code of the implementation can be found online at: <https://github.com/Janjs/3DCopy-Paste>.