Volumetric Capture

Report for the WS 19 Master Seminar *3D Scanning and Spatial Learning*

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Figure 1: Volumetric Fusion

ABSTRACT

Volumetric Capture is a technique used to reconstruct a 3D surface from one or multiple camera inputs. Using four RealSense cameras, we implemented a calibration solution to align their input depth images and then applied a static fusion aproach to rebuild the surface of the objects within the cameras' visible area. In this report, we describe our journey of implementing Real-Time Volumetric Capture, the challenges we had to tackle and the final results.

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1 INTRODUCTION

2 SETUP

- 4x Cameras, tripods, alignment, USB hubs

3 CALLIBRATION

- Charuco board - charuco diamond? - Bundle Adjustment and Procrustes - ICP

4 FUSION

- TSDF - Marching cubes

5 RESULTS

- speed? - accuracy of charuco detection? - resolution of mc?

6 IMPLEMENTATION

- Some words about the setup of our code and the classes, dependencies, etc. - OpenGL and glsm shader - github repo?

7 CONCLUSION AND FUTURE WORK

- Some takeaway lessons - Future work that can or must be done with our implementation - Cube calibration - Tracking

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