

# Supplementary material

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2 This paper registered another set of Buddha data (scene 2) which includes 1 TLS point cloud and  
3 35 SLS point clouds for illustrating the robustness of the proposed method (Fig. 1).

4 TLS point cloud was as reference target of global regularization, and each SLS point cloud was  
5 as aligned source. We registered all point clouds with the proposed method, the results of coarse  
6 alignment, pairwise fine registration and global regularization were as shown in Fig. 2.

7 From Fig. 2 (a), it can be seen that the coarse alignment got an initial pose estimate between TLS  
8 point cloud and SLS point cloud, but the error is large. After ICP was used for the coarse alignment  
9 result, pairwise registration between TLS point cloud and SLS point cloud got a fine result, and  
10 these large errors between TLS point cloud and 35 SLS point clouds were removed (Fig. 2(b)). But  
11 from the Fig. 2 (b), it can be seen that some gaps were produced at these overlaps of adjacent SLS  
12 point clouds. In order to eliminate these gaps, this paper used TLS point cloud as the reference  
13 control, and registered 1 TLS point cloud and 35 SLS point clouds based on global regularization  
14 (Fig. 2 (c)). It can be seen that these gaps were removed, and the registration result is fine.  
15 Meanwhile, the result also proves that the proposed method has certain robustness.

16 **Figure captions**

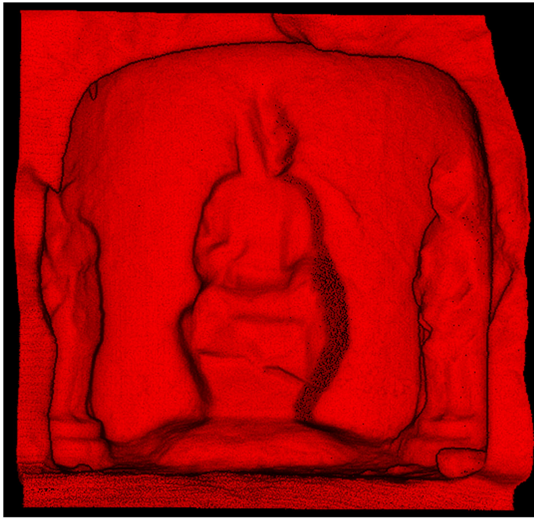
17 **Fig. 1.** TLS point cloud and 35 SLS point clouds.

18 (a) shows TLS point cloud (in red); (b) shows 35 SLS point clouds (in white).

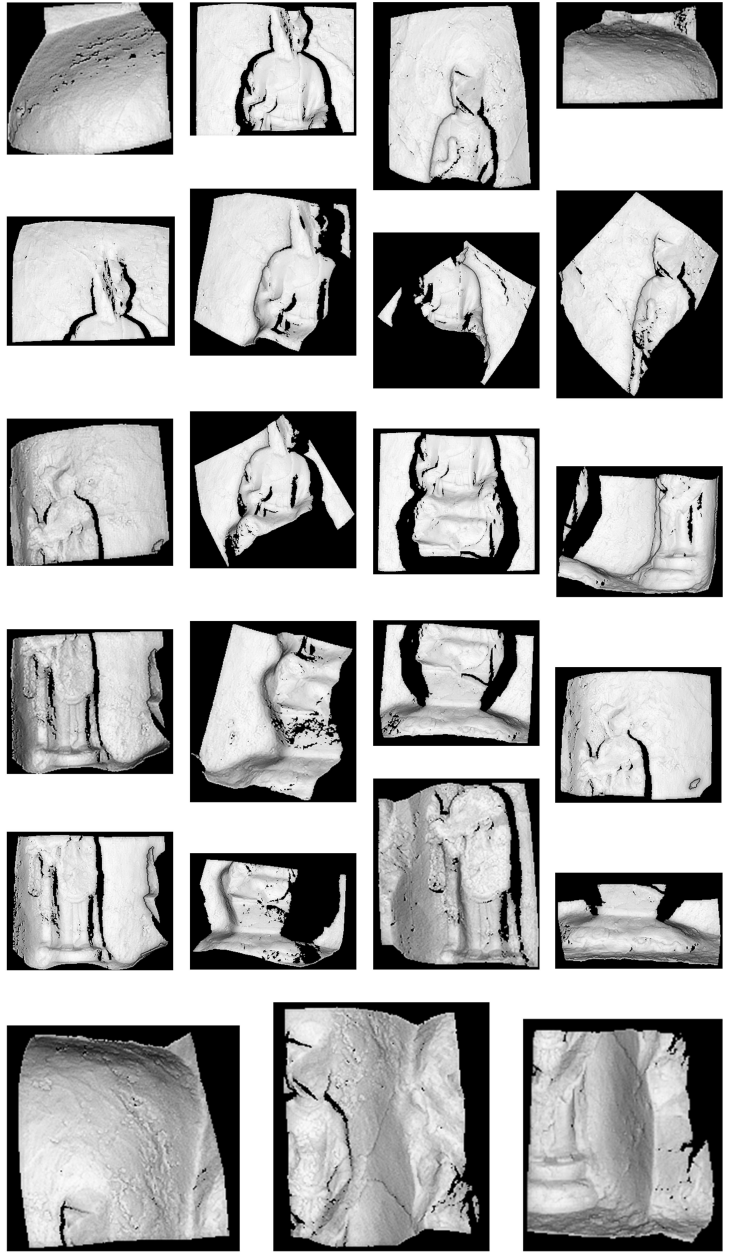
19 **Fig. 2.** Registration of another Buddha data.

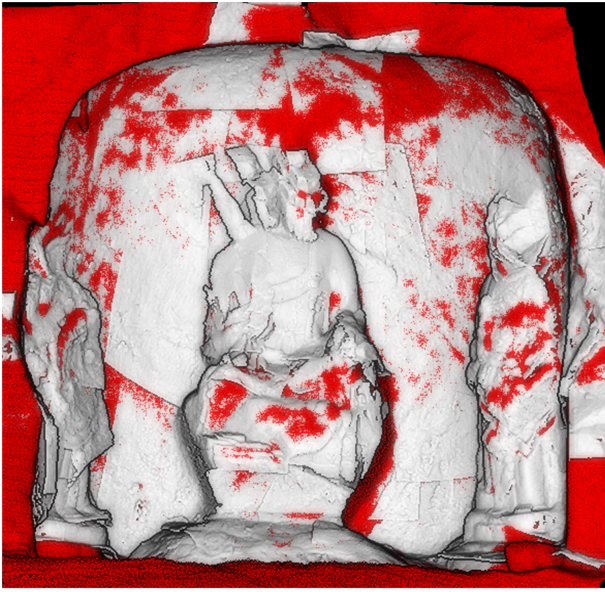
20 (a) shows coarse alignment based SUPER 4PCS; (b) shows pairwise fine registration; (c) shows final result after

21 global regularization (white parts are SLS point clouds; red part is TLS point cloud).

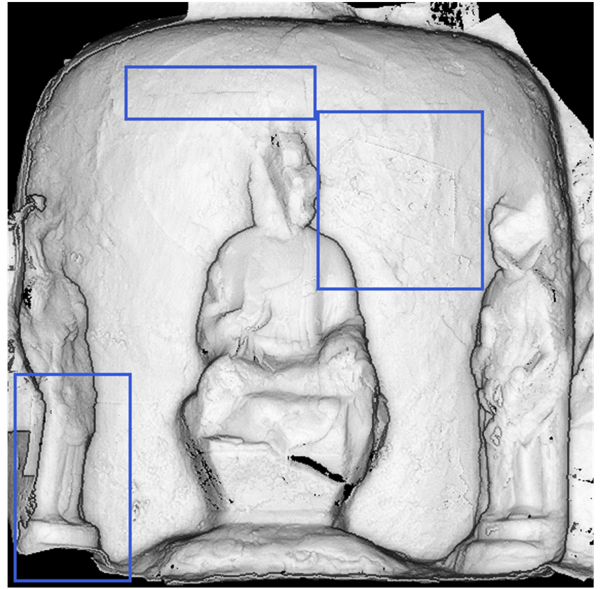
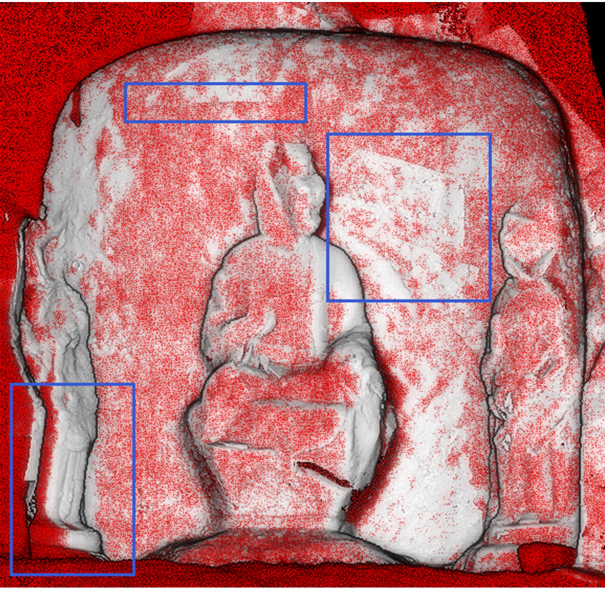


(a)





(a)



(b)



(c)