

# Accelerated Generative Models for 3D Point Cloud Data Supplementary Material

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This material is intended to supplement Figure 5 in the CVPR 2016 paper, “*Accelerated Generative Models for 3D Point Cloud Data*”. We wish to add further intuition regarding the differences in fidelity shown in this figure. To do this, we have highlighted a point on each series of trendlines for which we show the actual point cloud resampling used to calculate the fidelity of the model (via PSNR with respect to the reference PCD). It is perhaps easier to understand differences in fidelity by visual inspection than just by looking at a numerical PSNR metric.

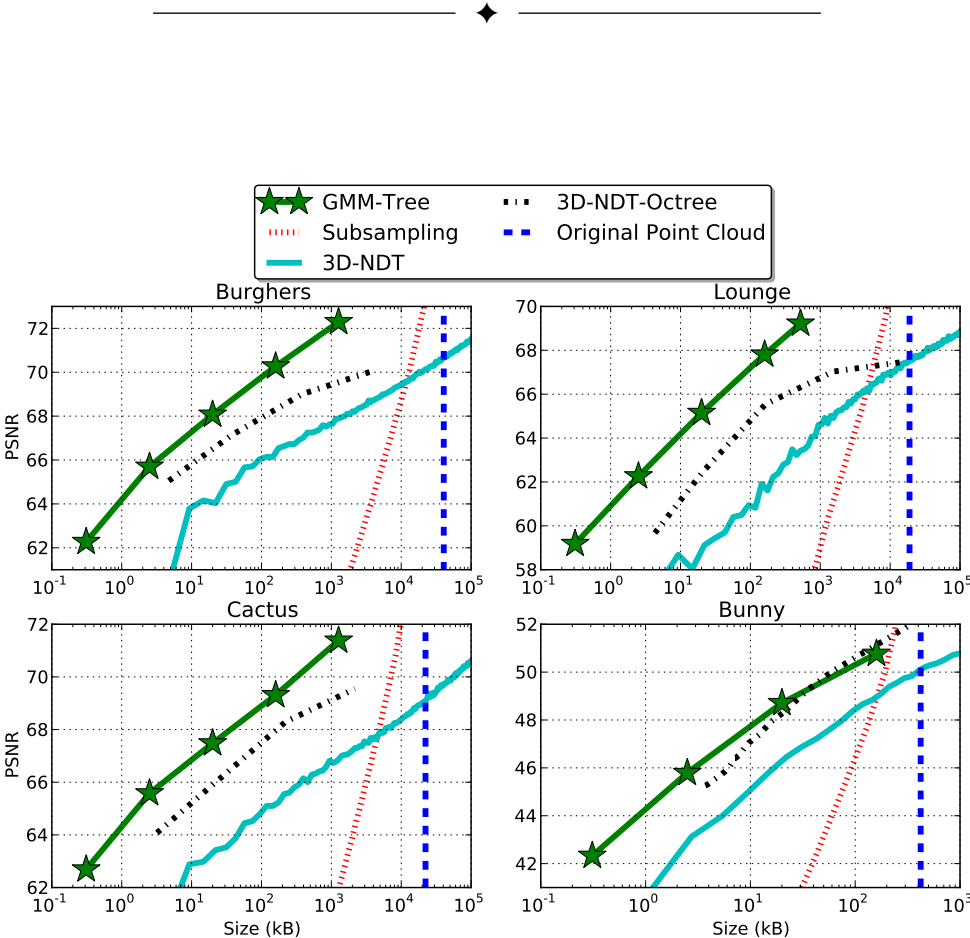


Fig. 1: A comparison of data structure size vs fidelity over several standard point cloud datasets. The blue dashed line indicates the original point cloud size. Note the x-axis is on log scale. The star markers indicate different levels in the GMM hierarchy. At similar size models, the hierarchical GMM has much better PSNR (reconstruction performance) with respect to the original data when compared against the 3D-NDT, 3D-NDT-Octree, and a simple subsampling strategy for point cloud reduction.

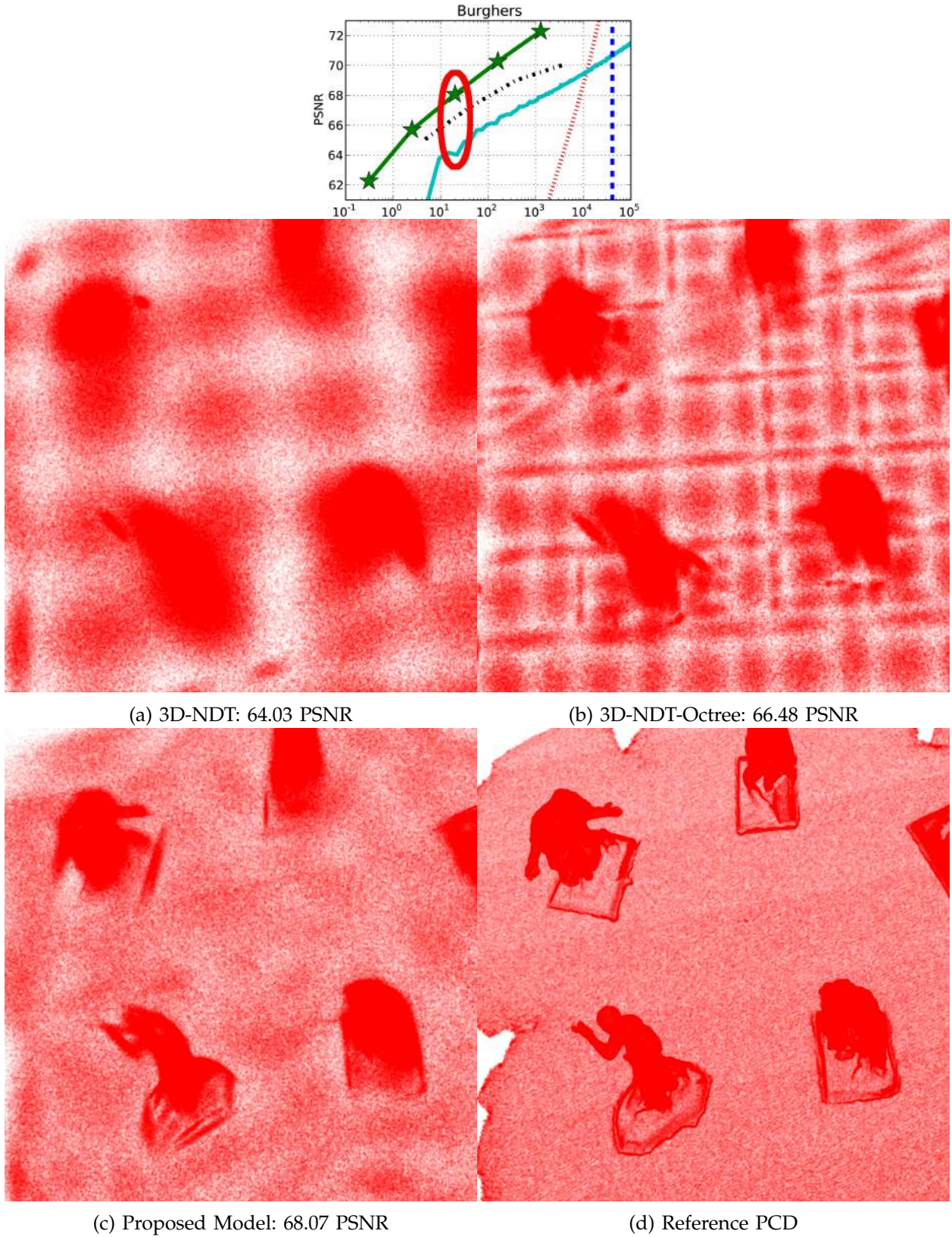
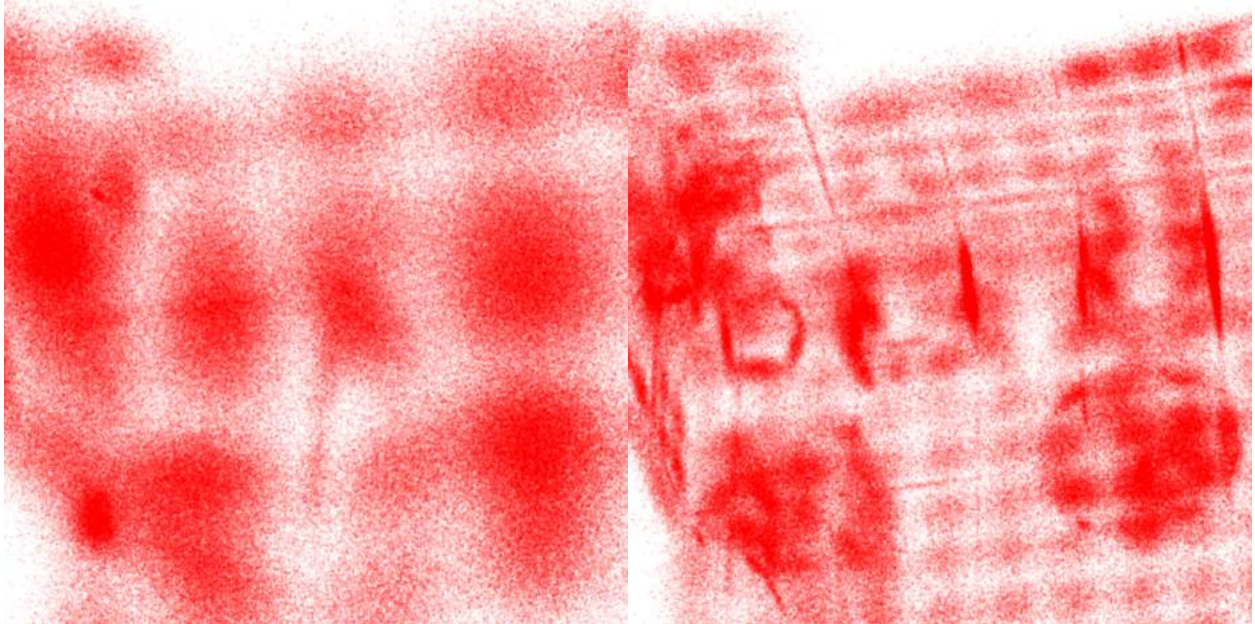
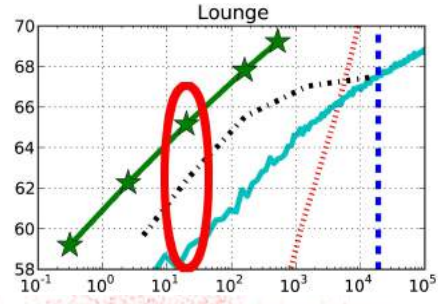


Fig. 2: **Burghers of Calais**: Comparison of reconstruction fidelity for same-sized models.





(a) 3D-NDT: 59.12 PSNR

(b) 3D-NDT-Octree: 62.37 PSNR

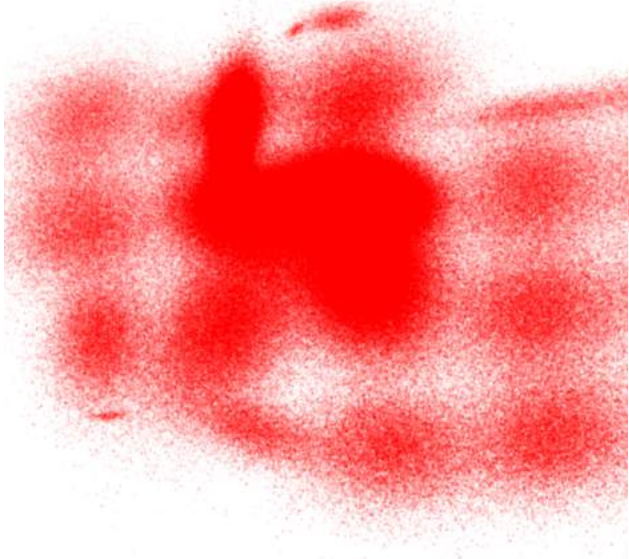
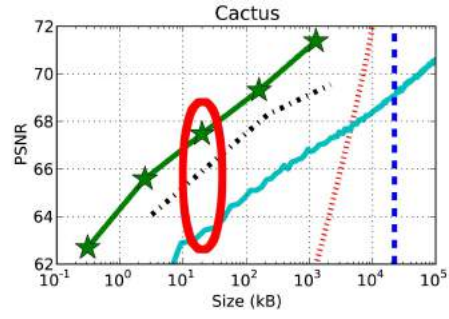


(c) Proposed Model: 65.15 PSNR

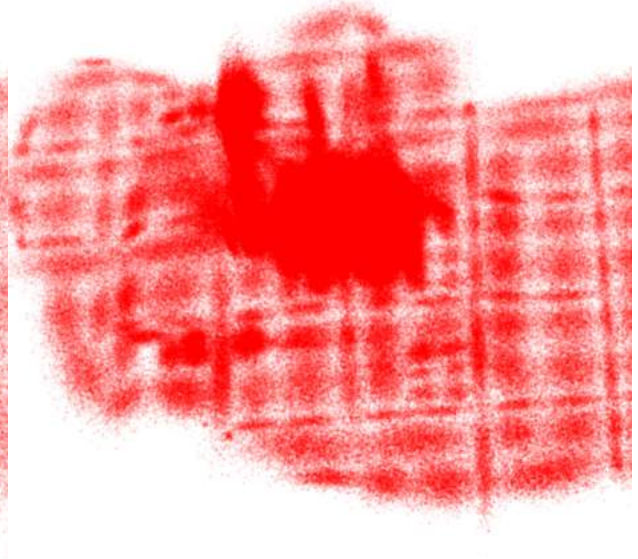
(d) Reference PCD

Fig. 3: **Lounge**: Comparison of reconstruction fidelity for same-sized models.

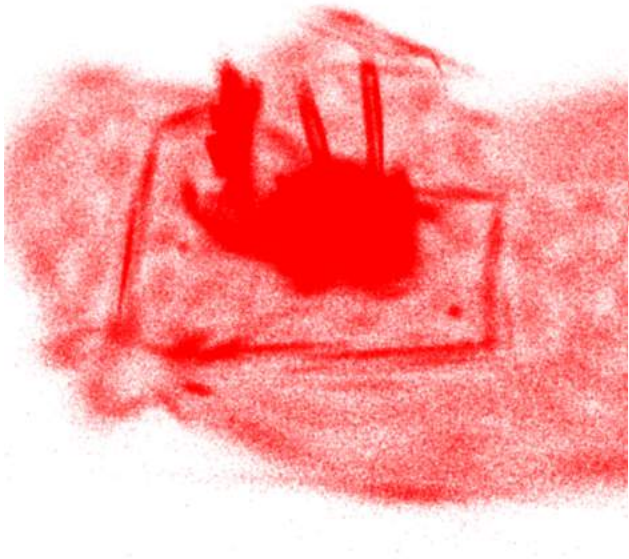




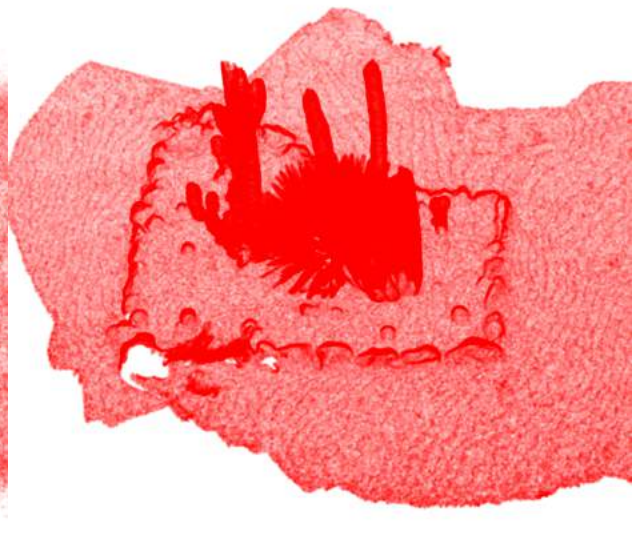
(a) 3D-NDT: 63.42 PSNR



(b) 3D-NDT-Octree: 65.83 PSNR

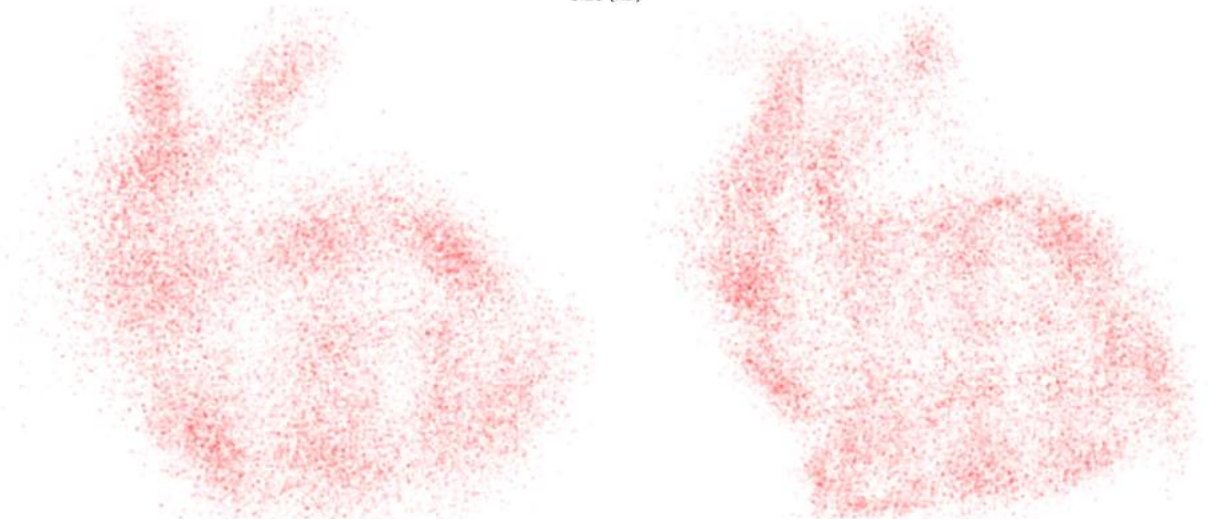
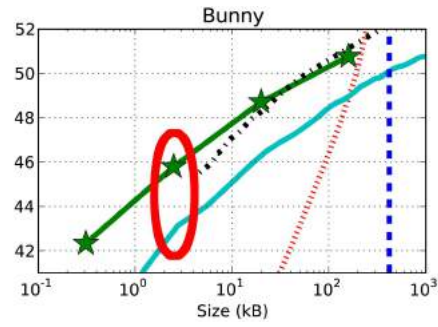


(c) Proposed Model: 67.48 PSNR



(d) Reference PCD

Fig. 4: **Cactus Garden**: Comparison of reconstruction fidelity for same-sized models.



(a) 3D-NDT: 43.02 PSNR

(b) 3D-NDT-Octree: 44.47 PSNR



(c) Proposed Model: 45.79 PSNR



(d) Reference PCD

Fig. 5: **Stanford Bunny**: Comparison of reconstruction fidelity for same-sized models.