Supplementary Material for Evaluations of Dynamic Gaussian Splats versus Point Clouds for Sparse Captures

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This document contains the supplemental material of the paper *Evaluations of Dynamic Gaussian Splats versus Point Clouds for Sparse Captures (S. Crocis et al)* [1].

I. Stimuli from the Gaussian splat vs Point cloud experiment

Figure 1 shows a sample frame from the stimuli used in the subjective experiment, with the point cloud and Gaussian splat reconstructions on the left and right, respectively. The figure captions indicate the names of the reconstructed subjects. In the experiment, we also used the same stimuli with the left–right order of the reconstructions reversed.

II. Per-Dynamic-Reconstruction Gaussian splat analysis

This section presents the GS analysis of all reconstructions in Figure 2 and then the per-sequence analysis in the Figures 3, 4, 5, 6, 7, 8. As can be observed, the analysis of the reconstructions do not vary so much.

III. Analysis of the Stimuli Watching Time

This section presents the analysis of the stimuli watching times collected during the subjective experiment. In particular, Figure 9 shows the histogram of the overall watching times, while Figures 10 show the per-capture histograms for the GS vs. PC and PC vs. GS stimuli. In these histograms, there are peaks close to 10 s, i.e., the duration of the stimuli. Figure 11 shows a bar chart of the median watching time for each sequence, with error bars indicating the interquartile range (IQR). In this chart, the medians are close to 10 s.

IV. Static Gaussian Splat Reconstructions Analysis

This section presents the GS analysis of some static GS reconstructions generated with a scene GS optimization method called Postshot [2]. Figure 12 shows the GS analysis of all static reconstructions. It can be observed, that there is a clear difference between the dynamic GS reconstructions of our paper and the static ones.

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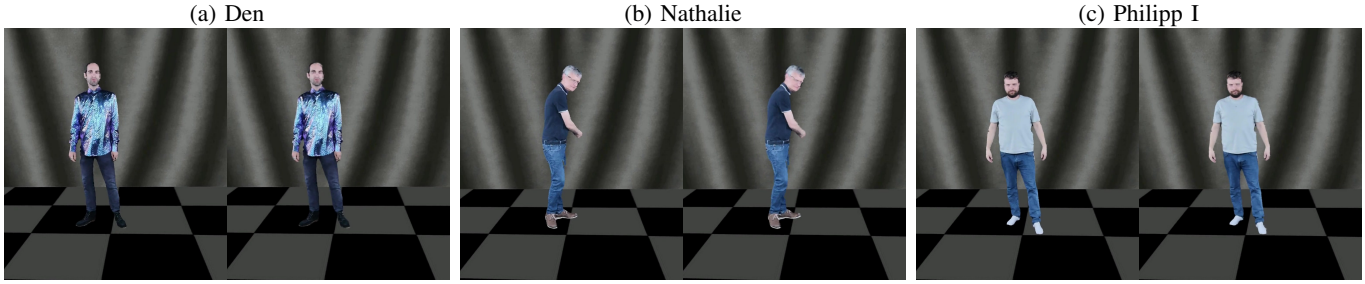
References

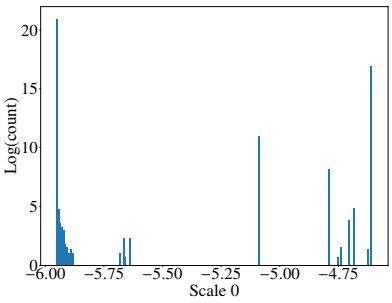
[1] A. Charisoudis, S. Croci, K. Y. Lam, P. Frossard, and A. Smolic, "A fast volumetric capture and reconstruction pipeline for dynamic point clouds and gaussian splats," in *Proceedings of the 22nd ACM SIGGRAPH European Conference on Visual Media Production*, ser. CVMP '25. New York, NY, USA: Association for Computing Machinery, 2025. [Online]. Available: https://doi.org/10.1145/3756863.3769713
[2] (2025) Postshot. [Online]. Available: https://www.jawset.com/

(a) Den (b) Nathalie (c) Philipp I

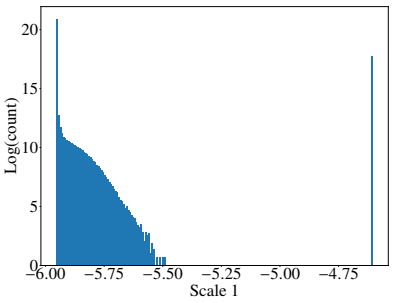


(d) Philipp II (e) Simone (f) Thanos

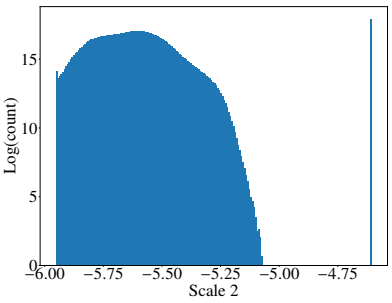
Fig. 1: Stimuli with point cloud and Gaussian splat reconstructions on the left and right, respectively. In the subjective experiment, we also used the same reconstructions but with reversed order.



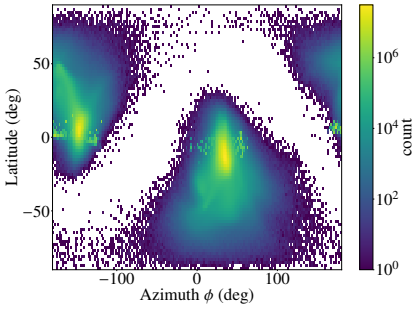
(a) Scale 0 histogram.



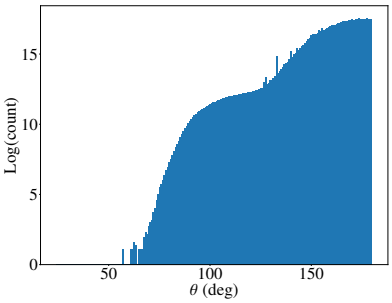
(b) Scale 1 histogram.



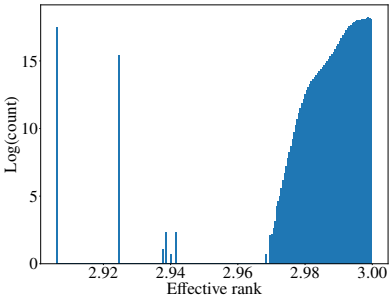
(c) Scale 2 histogram.



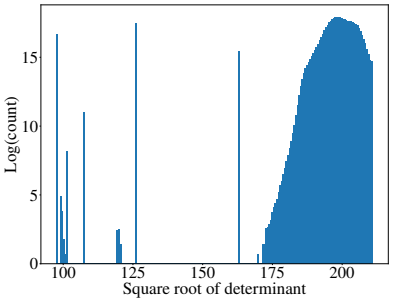
(d) Rotation axis spherical histogram.



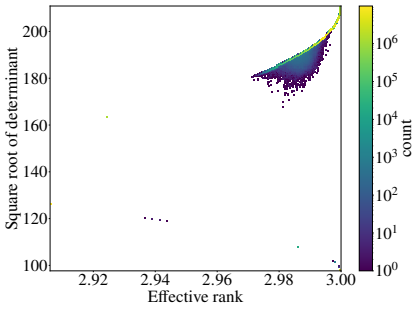
(e) Rotation angle θ histogram.



(f) Covariance matrix effective rank histogram.

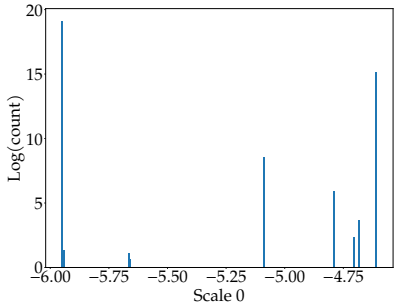


(g) Square root of the covariance matrix determinant.

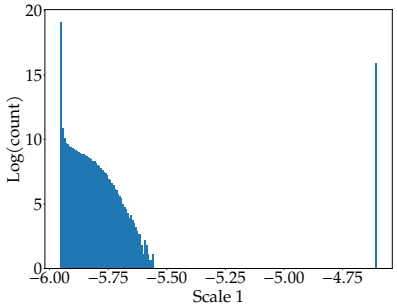


(h) Effective rank vs square root of the covariance matrix determinant.

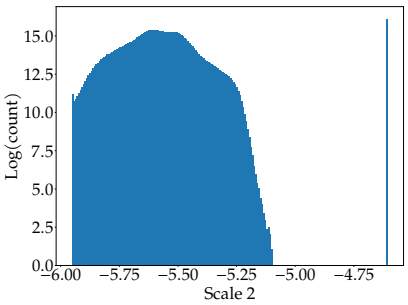
Fig. 2: Gaussian splats analysis of all dynamic reconstructions.



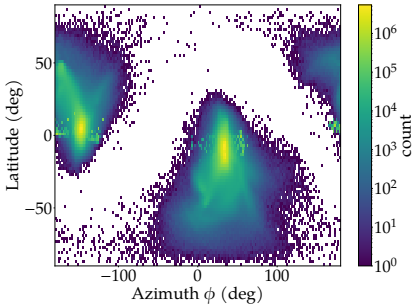
(a) Scale 0 histogram.



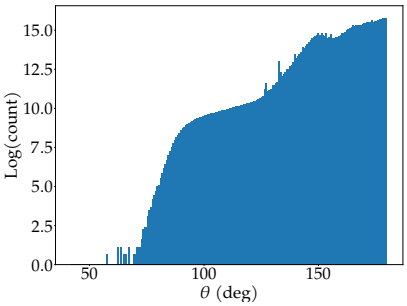
(b) Scale 1 histogram.



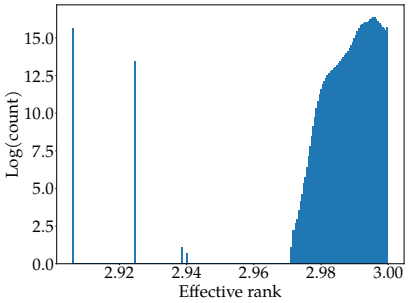
(c) Scale 2 histogram.



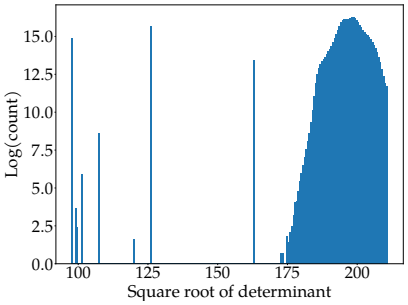
(d) Rotation axis spherical histogram.



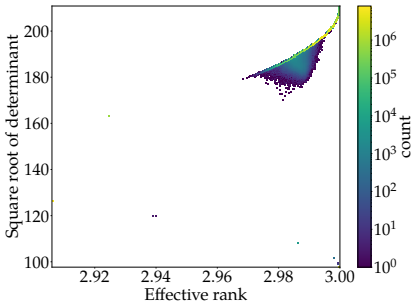
(e) Rotation angle θ histogram.



(f) Covariance matrix effective rank histogram.

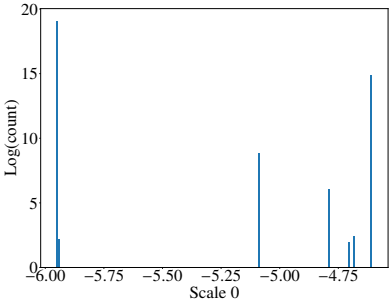


(g) Square root of the covariance matrix determinant.

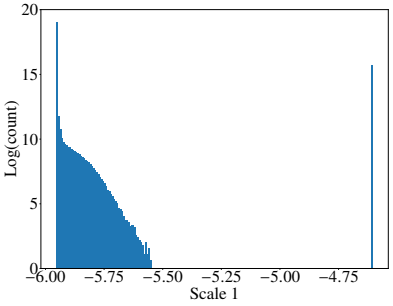


(h) Effective rank vs square root of the covariance matrix determinant.

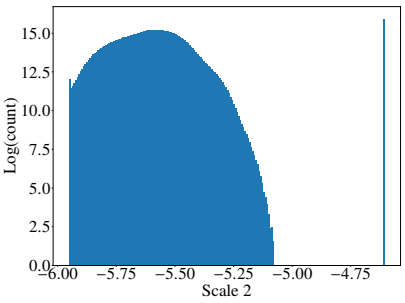
Fig. 3: Gaussian splats analysis of Den's dynamic reconstruction.



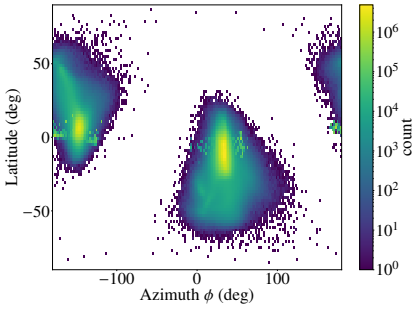
(a) Scale 0 histogram.



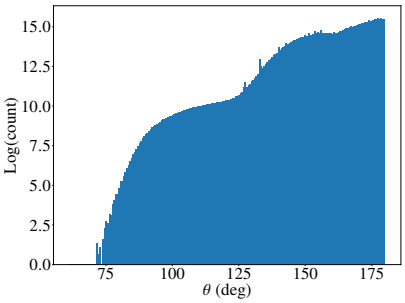
(b) Scale 1 histogram.



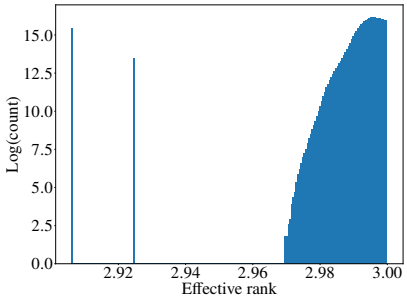
(c) Scale 2 histogram.



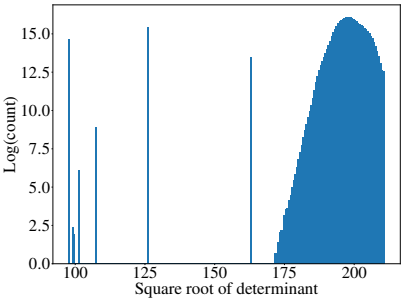
(d) Rotation axis spherical histogram.



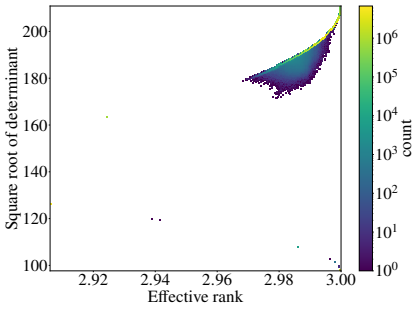
(e) Rotation angle θ histogram.



(f) Covariance matrix effective rank histogram.

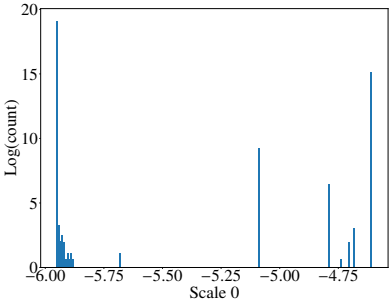


(g) Square root of the covariance matrix determinant.

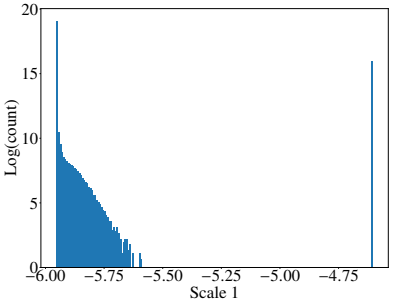


(h) Effective rank vs square root of the covariance matrix determinant.

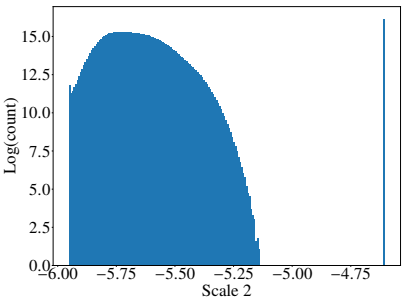
Fig. 4: Gaussian splats analysis of Nathalie's dynamic reconstruction.



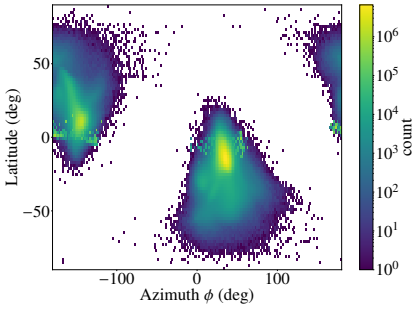
(a) Scale 0 histogram.



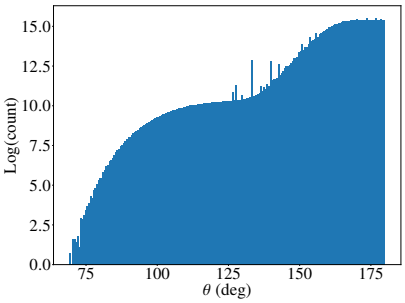
(b) Scale 1 histogram.



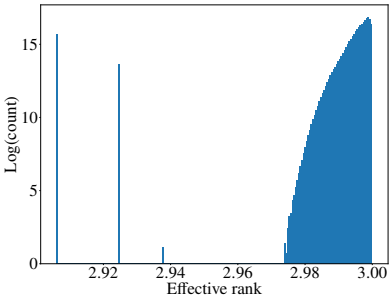
(c) Scale 2 histogram.



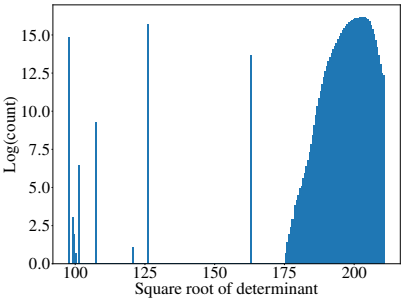
(d) Rotation axis spherical histogram.



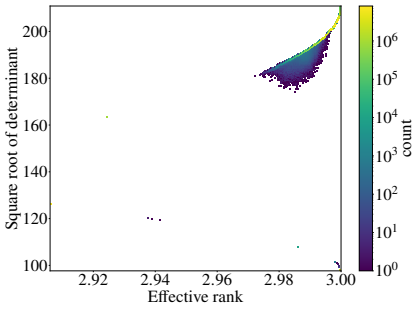
(e) Rotation angle θ histogram.



(f) Covariance matrix effective rank histogram.

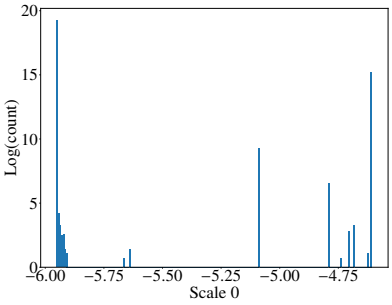


(g) Square root of the covariance matrix determinant.

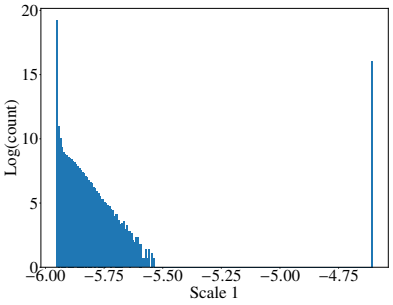


(h) Effective rank vs square root of the covariance matrix determinant.

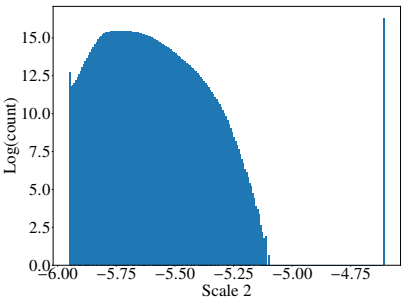
Fig. 5: Gaussian splats analysis of Philipp I's dynamic reconstruction.



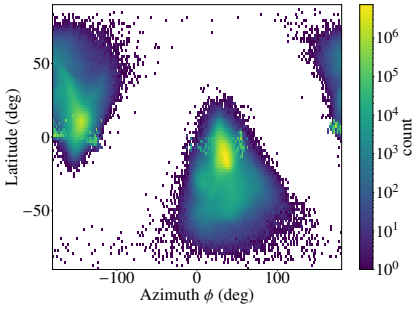
(a) Scale 0 histogram.



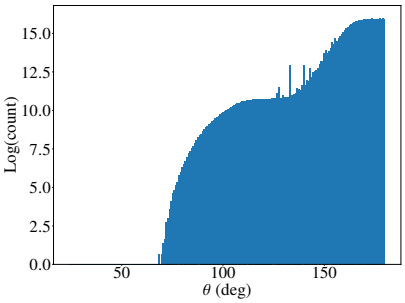
(b) Scale 1 histogram.



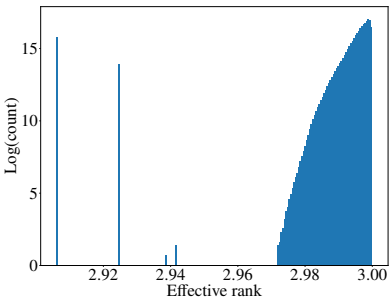
(c) Scale 2 histogram.



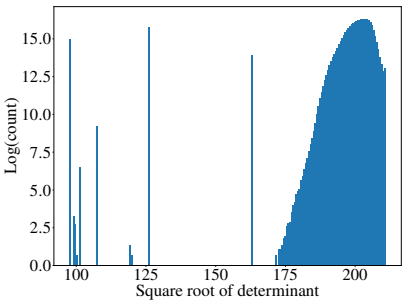
(d) Rotation axis spherical histogram.



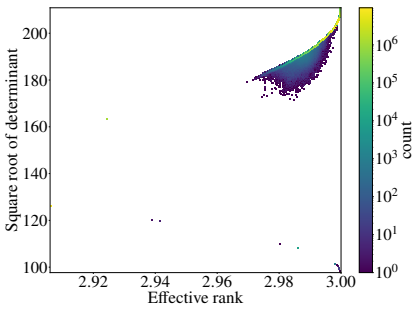
(e) Rotation angle θ histogram.



(f) Covariance matrix effective rank histogram.

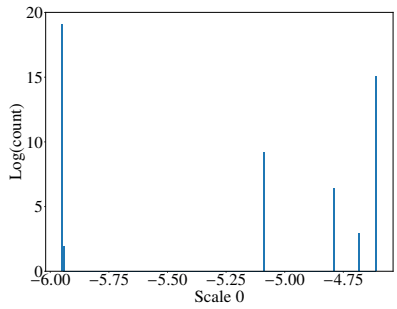


(g) Square root of the covariance matrix determinant.

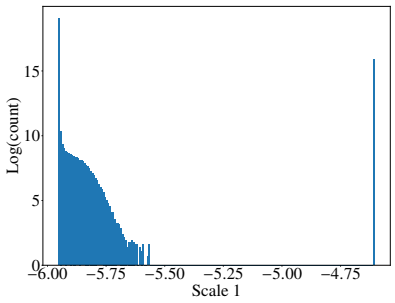


(h) Effective rank vs square root of the covariance matrix determinant.

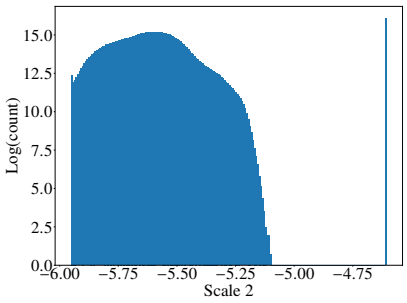
Fig. 6: Gaussian splats analysis of Philipp II's dynamic reconstruction.



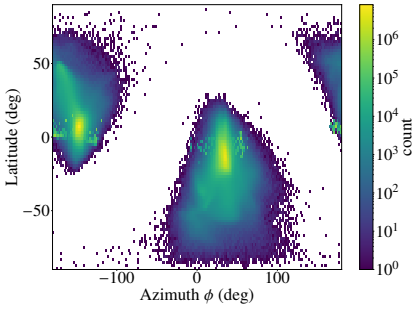
(a) Scale 0 histogram.



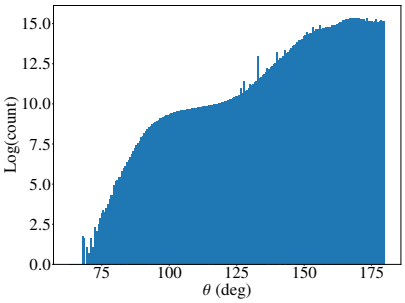
(b) Scale 1 histogram.



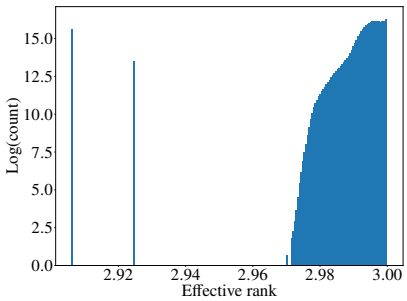
(c) Scale 2 histogram.



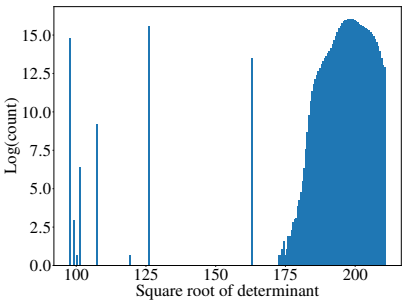
(d) Rotation axis spherical histogram.



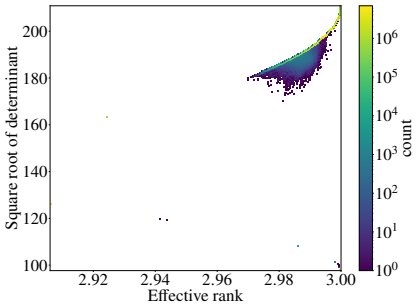
(e) Rotation angle θ histogram.



(f) Covariance matrix effective rank histogram.

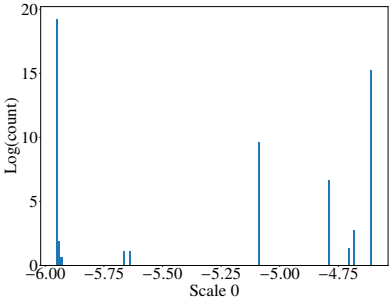


(g) Square root of the covariance matrix determinant.

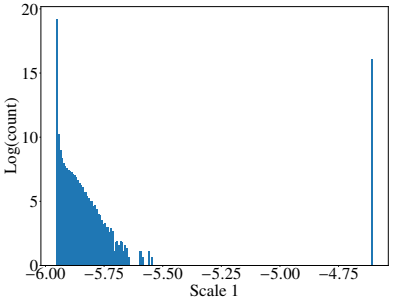


(h) Effective rank vs square root of the covariance matrix determinant.

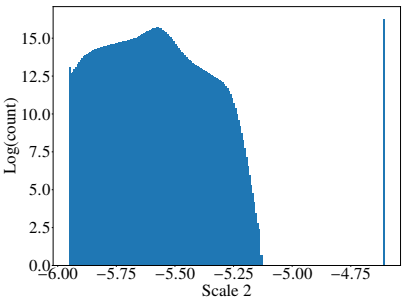
Fig. 7: Gaussian splats analysis of Simone's dynamic reconstruction.



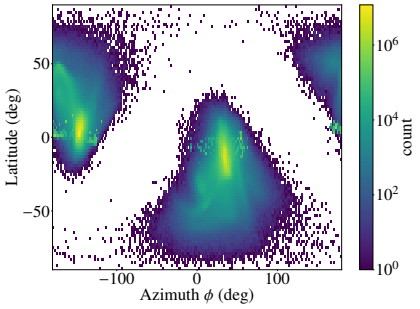
(a) Scale 0 histogram.



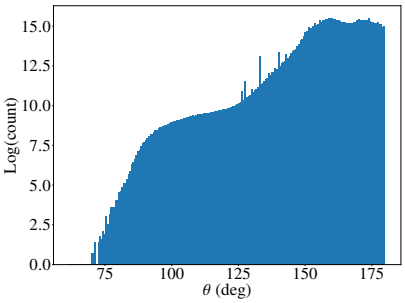
(b) Scale 1 histogram.



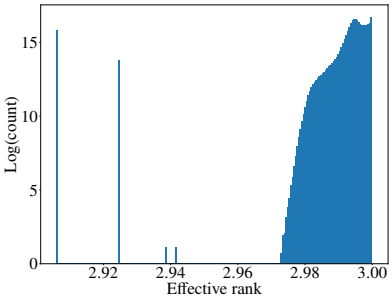
(c) Scale 2 histogram.



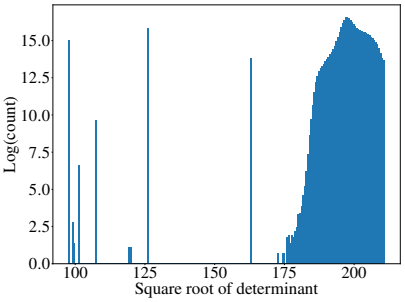
(d) Rotation axis spherical histogram.



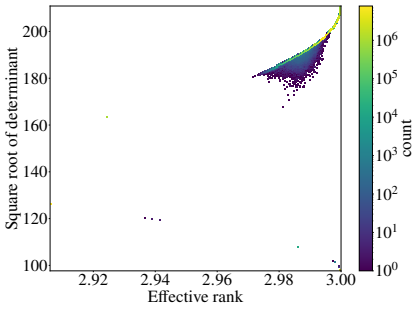
(e) Rotation angle θ histogram.



(f) Covariance matrix effective rank histogram.



(g) Square root of the covariance matrix determinant.



(h) Effective rank vs square root of the covariance matrix determinant.

Fig. 8: Gaussian splats analysis of Thanos's dynamic reconstruction.

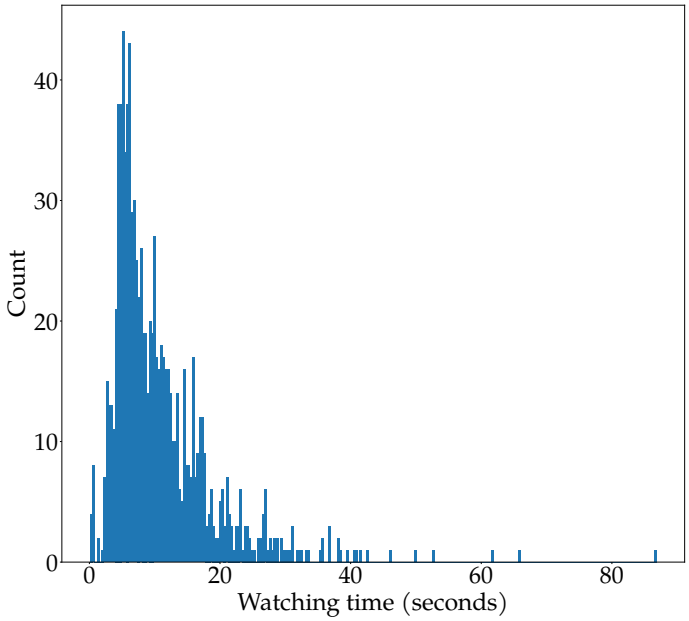
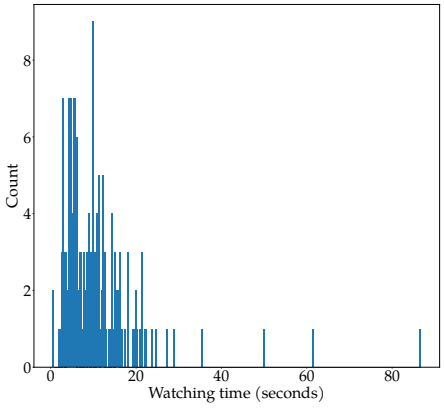
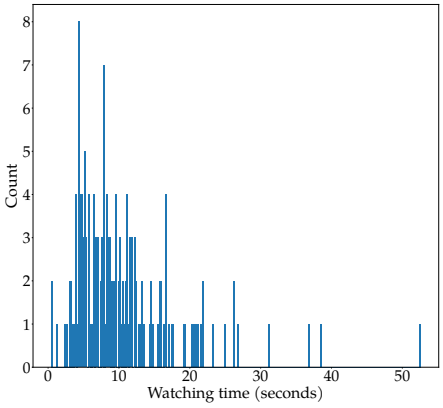


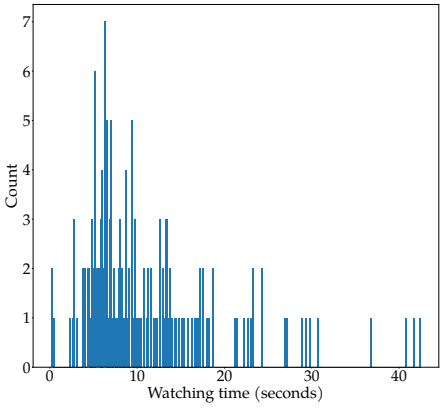
Fig. 9: Stimuli watching time histogram.



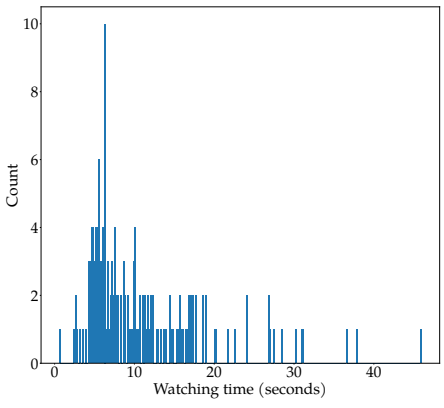
(a) Den



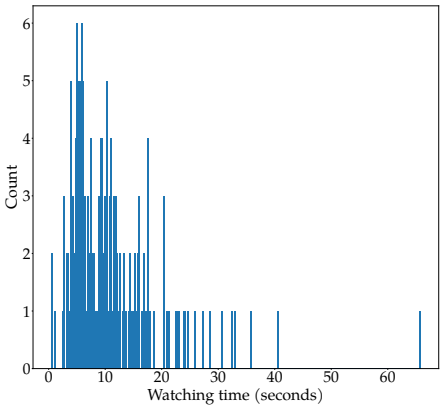
(b) Nathalie



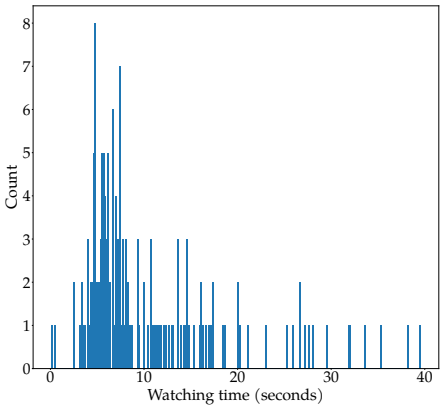
(c) Philipp I



(d) Philipp II



(e) Simone



(f) Thanos

Fig. 10: Per-capture histograms for the GS vs. PC and PC vs. GS stimuli.

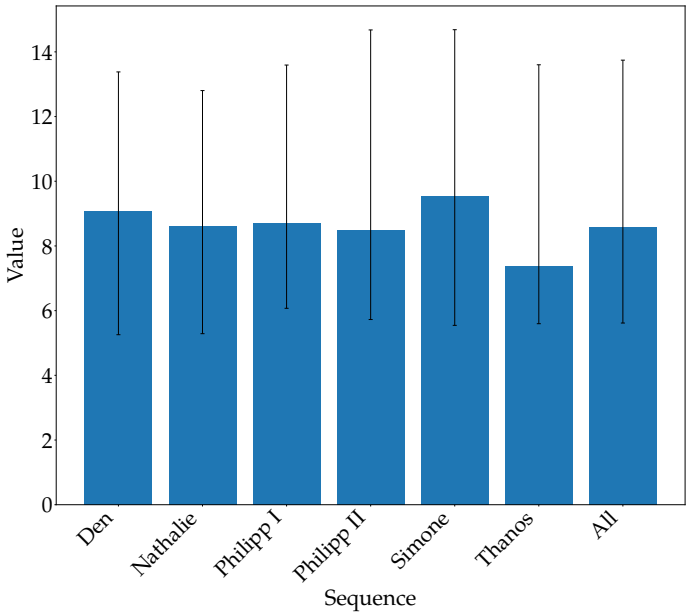
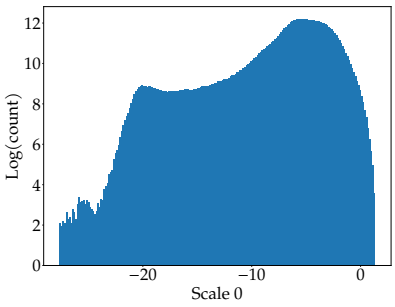
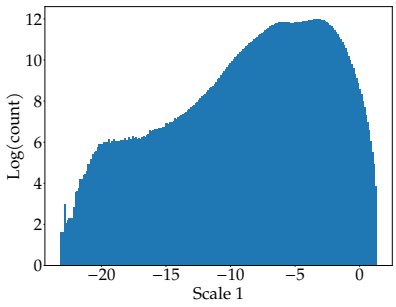


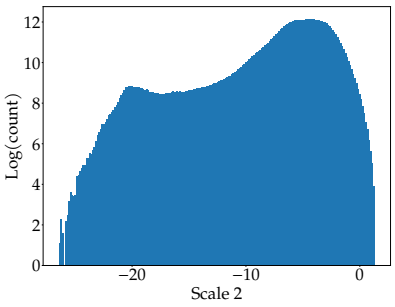
Fig. 11: Bar chart of the watching times (bars = median, error bars = interquartile range).



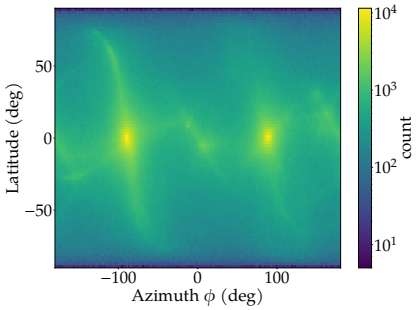
(a) Scale 0 histogram.



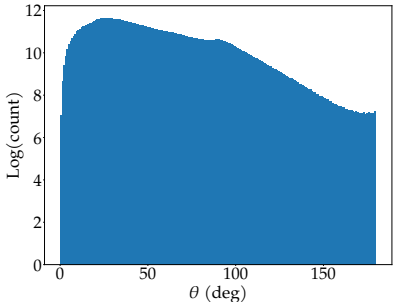
(b) Scale 1 histogram.



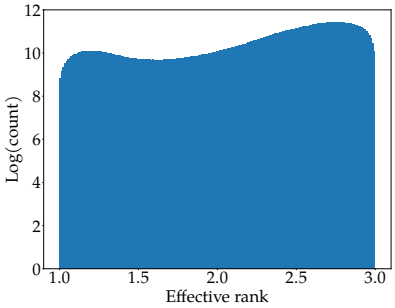
(c) Scale 2 histogram.



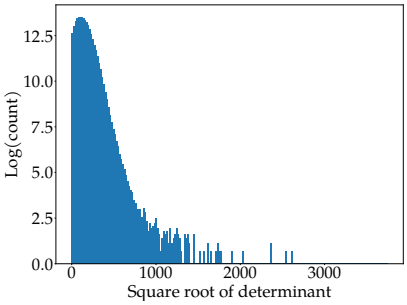
(d) Rotation axis spherical histogram.



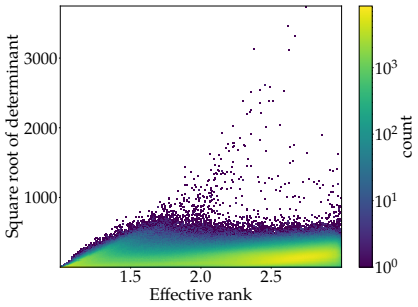
(e) Rotation angle θ histogram.



(f) Covariance matrix effective rank histogram.



(g) Square root of the covariance matrix determinant.



(h) Effective rank vs square root of the covariance matrix determinant.

Fig. 12: Gaussian splats analysis from all static reconstructions.