

Polarimetric Multi-View Inverse Rendering

Supplementary material

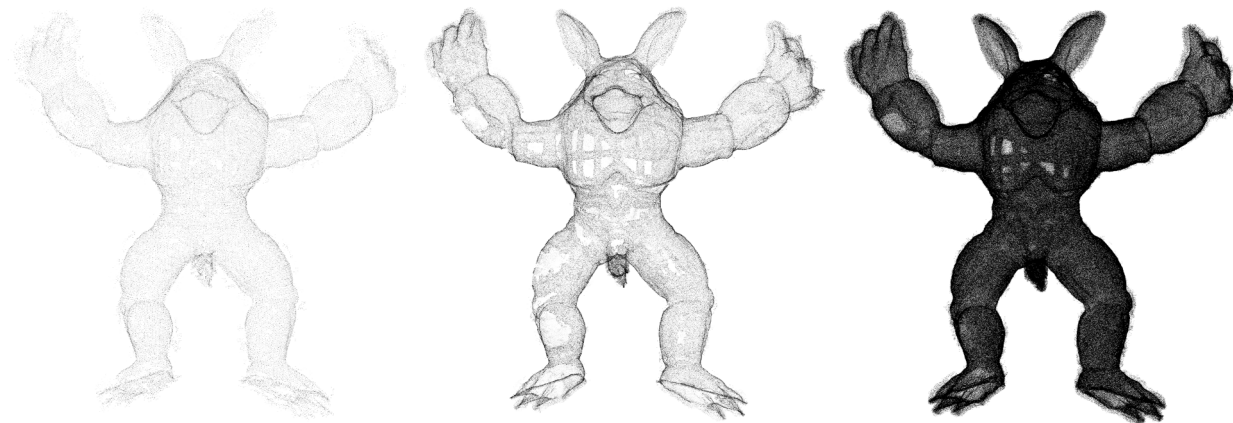
ECCV 2020

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Tokyo Institute of Technology

Comparison using synthetic data

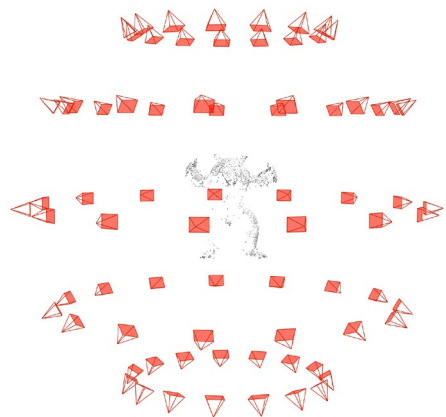
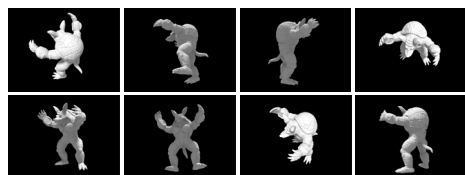
Armadillo



PMVS

COLMAP

OpenMVS



Input images and camera poses



Ground truth



PMVS+Poisson



COLMAP+Poisson



OpenMVS



CPMVS

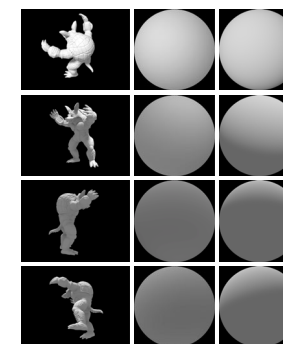


MVIR



Polarimetric MVIR (Ours)

Estimated illumination

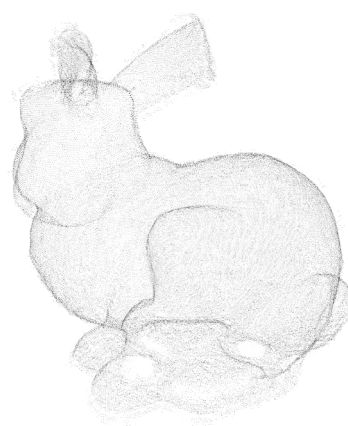


Image

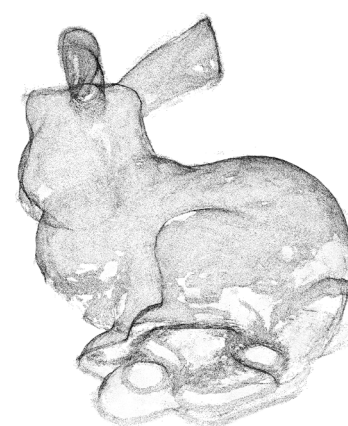
Ours

GT

Bunny



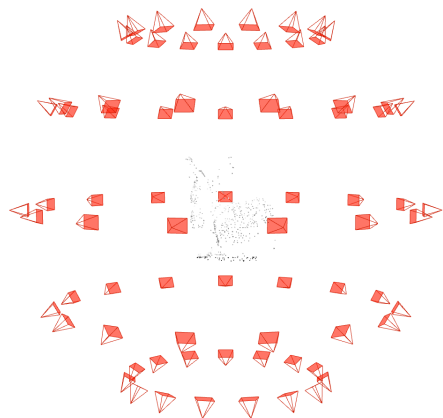
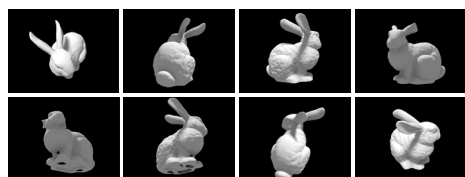
PMVS



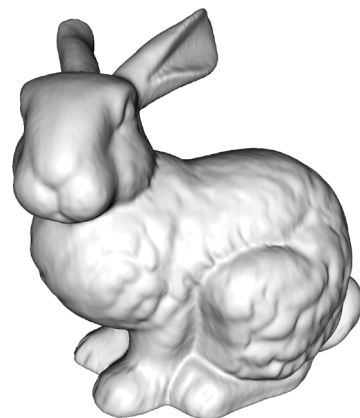
COLMAP



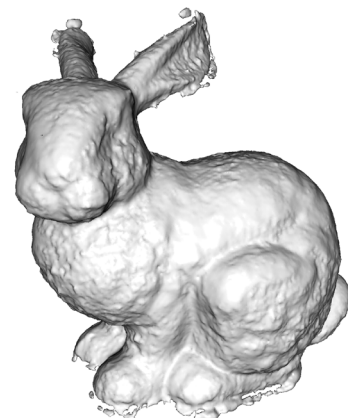
OpenMVS



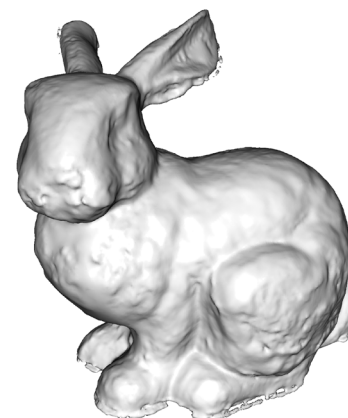
Input images and camera poses



Ground truth



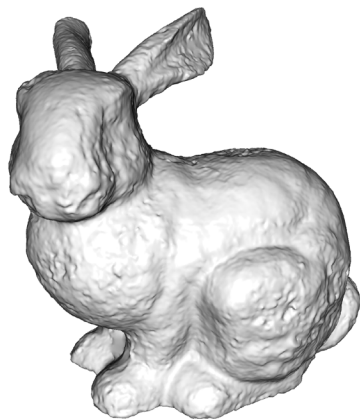
PMVS+Poisson



COLMAP+Poisson



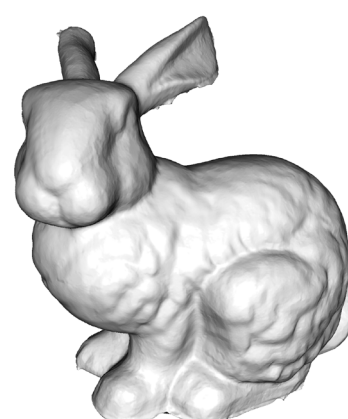
OpenMVS



CMPMVS



MVIR



Polarimetric MVIR (Ours)

Estimated illumination

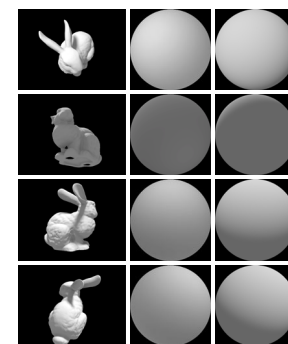
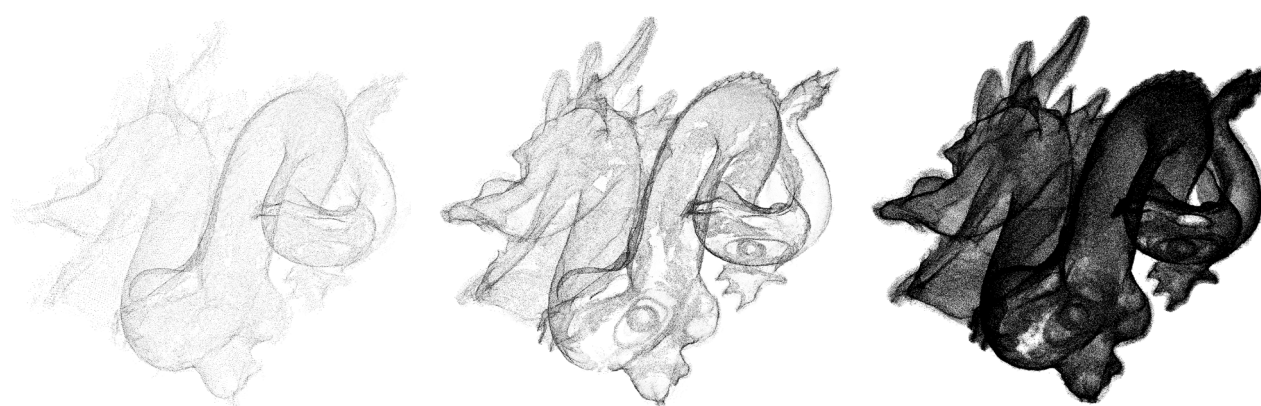


Image Ours GT

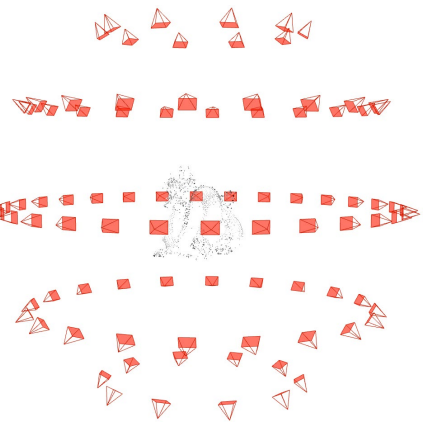
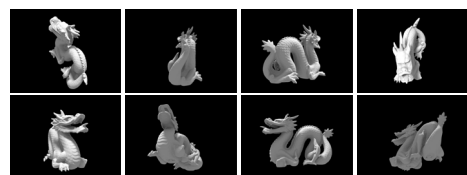
Dragon



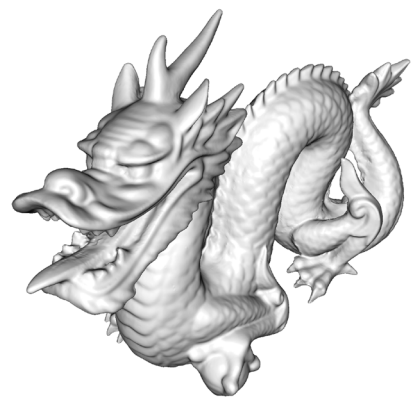
PMVS

COLMAP

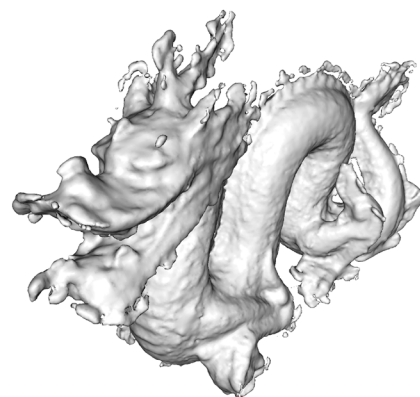
OpenMVS



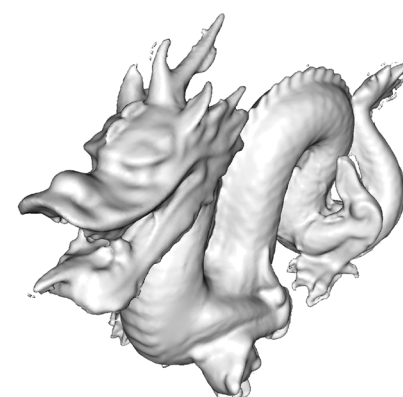
Input images and camera poses



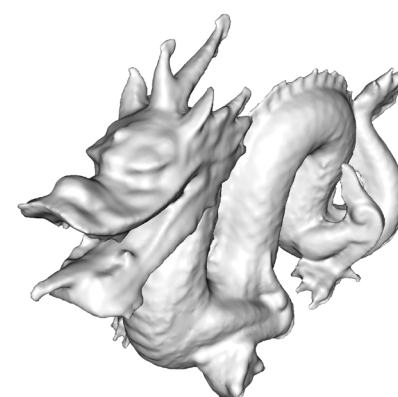
Ground truth



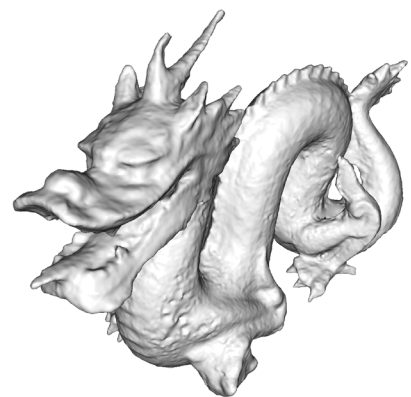
PMVS+Poisson



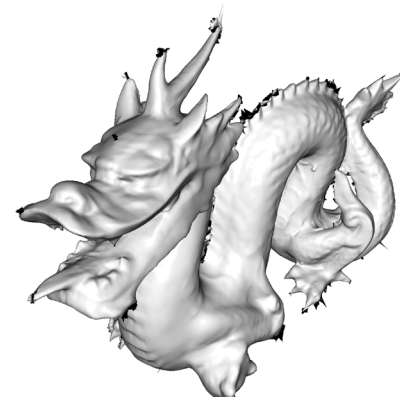
COLMAP+Poisson



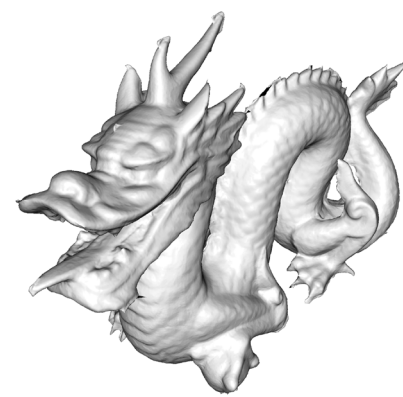
OpenMVS



CMPMVS



MVIR



Polarimetric MVIR (Ours)

Estimated illumination

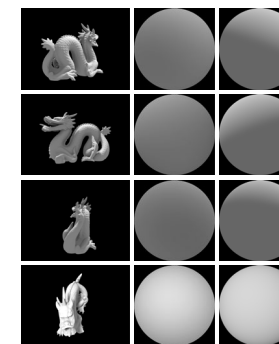
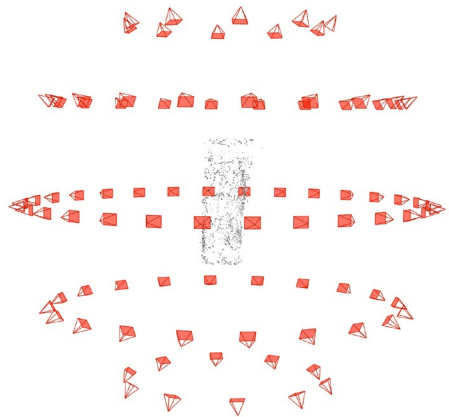


Image Ours GT

Buddha



Input images and camera poses



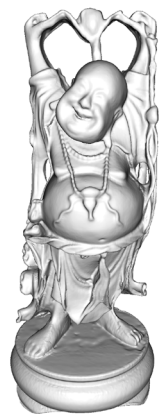
PMVS



COLMAP



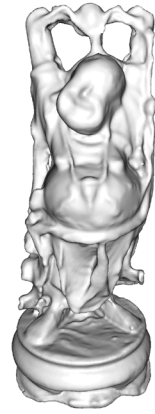
OpenMVS



Ground truth



PMVS+Poisson



COLMAP+Poisson



OpenMVS



CMPMVS



MVIR



Polarimetric MVIR (Ours)

Estimated illumination

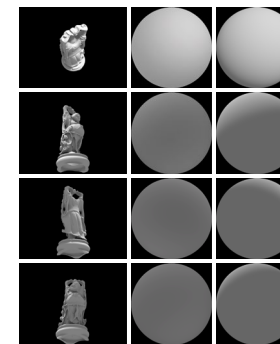


Image Ours GT

Numerical evaluation

Comparisons of the average accuracy (Acc.) and completeness (Comp.) errors

		PMVS	CMPMVS	COLMAP	OpenMVS	MVIR	Ours
Armadillo	# of Vertices	60250	330733	268343	2045829	305555	305548
	Acc. ($\times 10^{-2}$)	1.2634	0.6287	0.7436	0.8503	0.7667	0.4467
	Comp. ($\times 10^{-2}$)	1.5261	0.8676	1.0295	0.6893	0.9311	0.6365
Bunny	# of Vertices	92701	513426	334666	2394638	399864	399863
	Acc. ($\times 10^{-2}$)	1.0136	0.7766	0.7734	1.0222	0.7629	0.5706
	Comp. ($\times 10^{-2}$)	1.3873	0.9581	1.6987	0.8466	0.8118	0.6447
Dragon	# of Vertices	88519	474219	399624	2820589	460888	460667
	Acc. ($\times 10^{-2}$)	1.4321	0.8826	0.9001	1.0421	0.8563	0.6258
	Comp. ($\times 10^{-2}$)	2.0740	1.4036	1.6606	1.3179	1.2237	1.0222
Buddha	# of Vertices	61259	338654	320539	2204122	348967	348691
	Acc. ($\times 10^{-2}$)	1.7658	1.0565	0.9658	1.0878	1.0588	0.7926
	Comp. ($\times 10^{-2}$)	2.4254	1.5666	2.0094	1.4859	1.3968	1.1487
Average	Acc. ($\times 10^{-2}$)	1.3687	0.8361	0.8457	1.0006	0.8612	0.6089
	Comp. ($\times 10^{-2}$)	1.8532	1.1990	1.5996	1.0849	1.0909	0.8630

Comparison using real data

Toy car: Our results

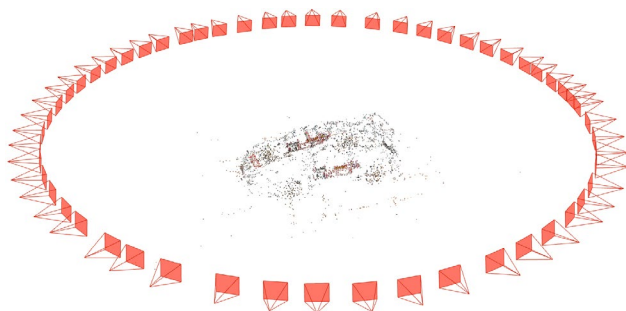
- 56 views



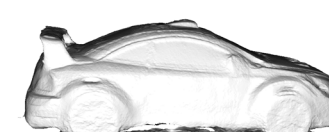
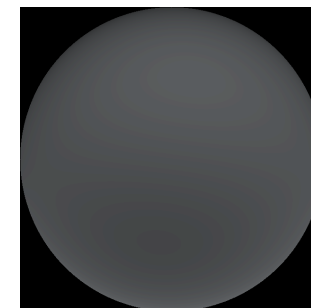
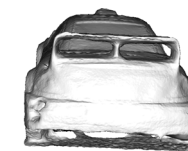
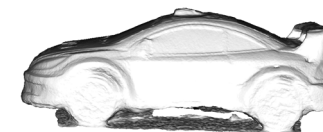
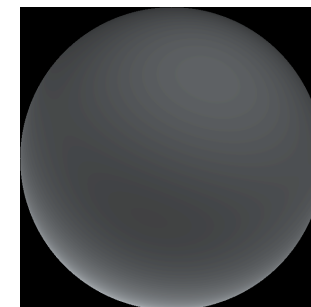
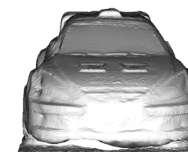
RGB images



AoP images



Estimated camera poses



Input image

Estimated albedo

Estimated shape

Estimated illumination

Toy car: Comparison

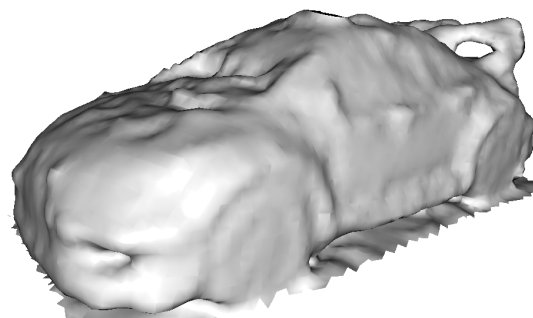
- 56 views



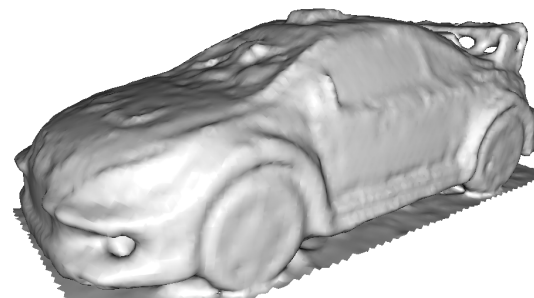
RGB images



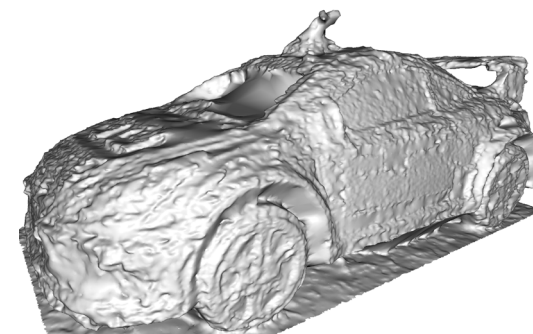
AoP images



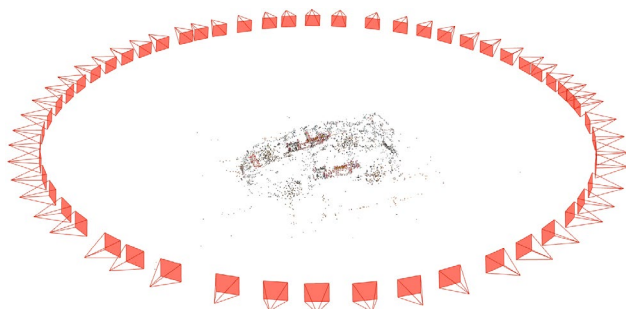
PMVS



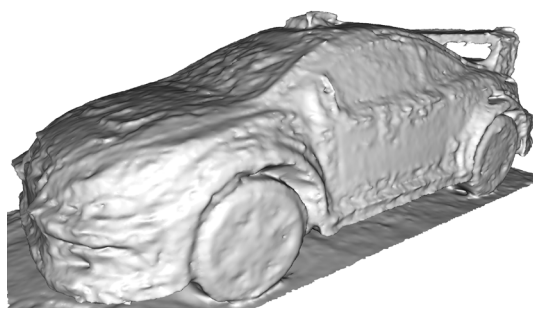
COLMAP+Poisson



CMPMVS



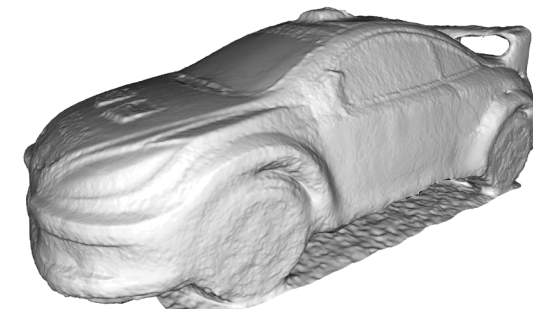
Estimated camera poses



OpenMVS



MVIR



Polarimetric MVIR (Ours)

Camera: Our results

- 31 views



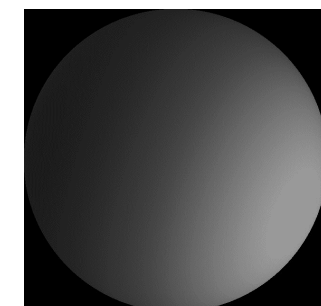
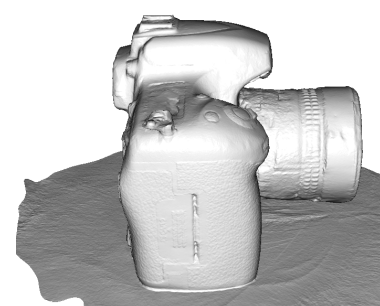
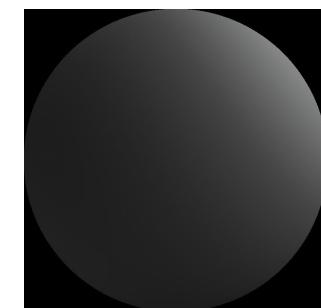
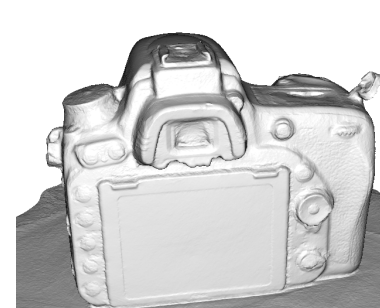
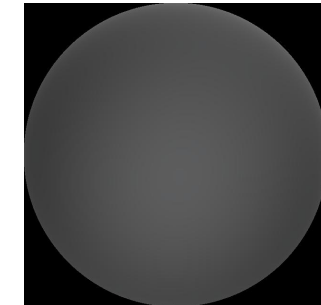
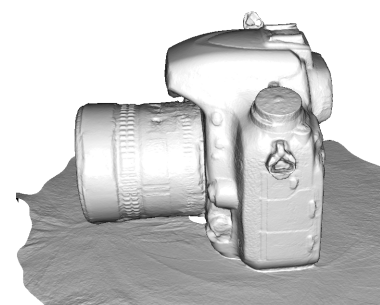
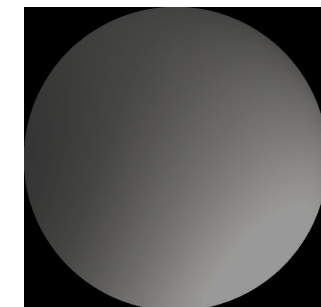
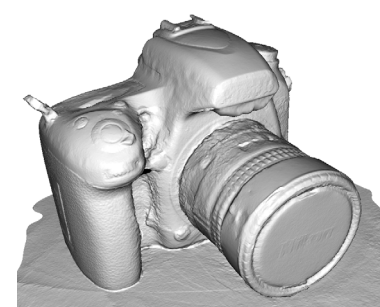
RGB images



AoP images



Estimated camera poses



Input image

Estimated albedo

Estimated shape

Estimated illumination

Camera: Comparison

- 31 views



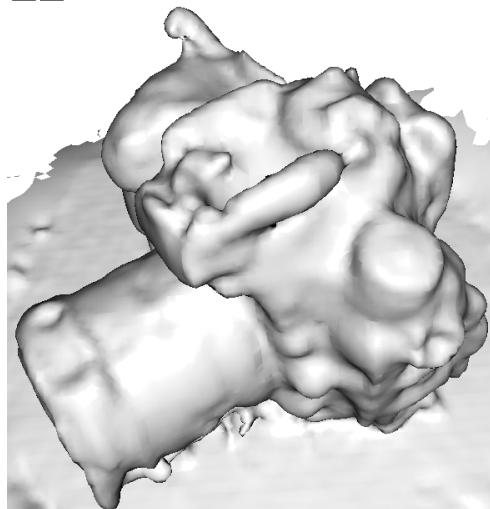
RGB images



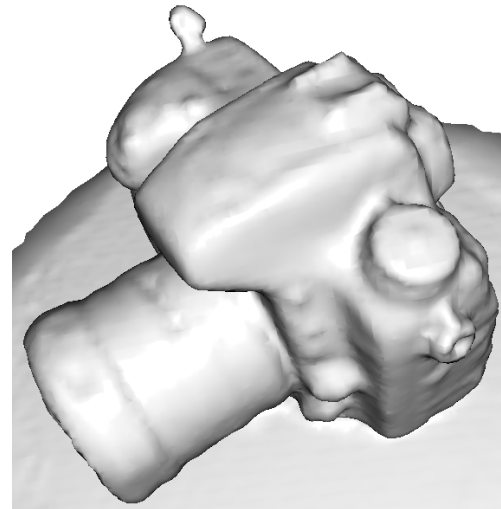
AoP images



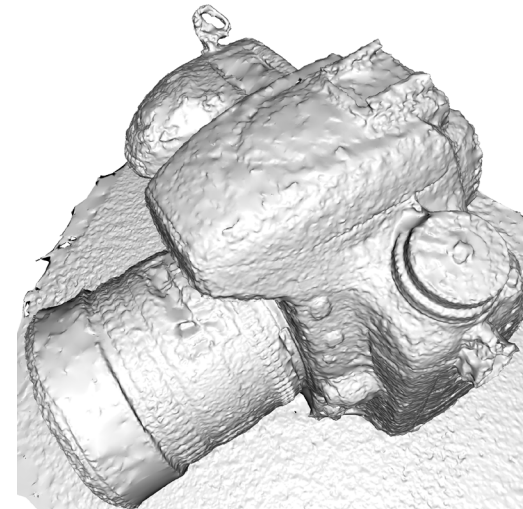
Estimated camera poses



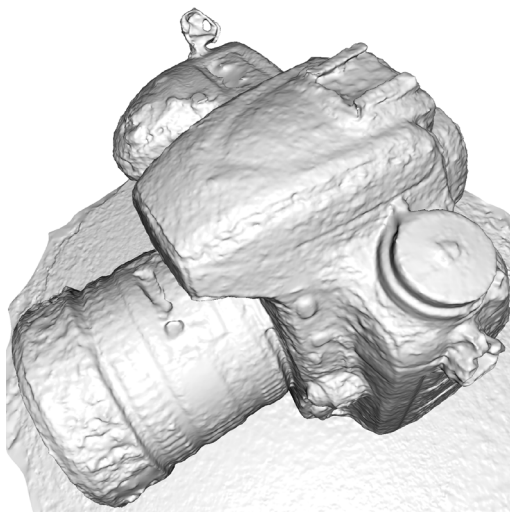
PMVS



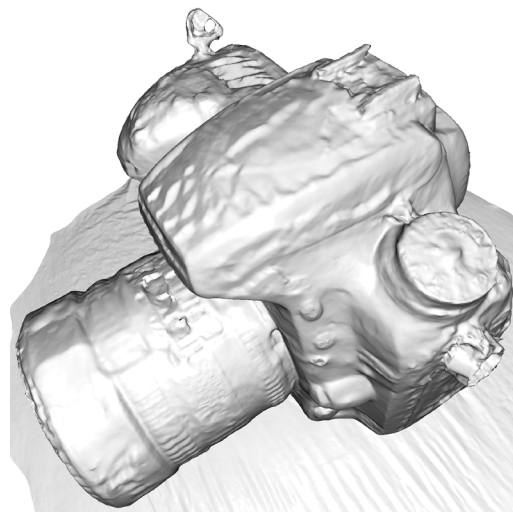
COLMAP+Poisson



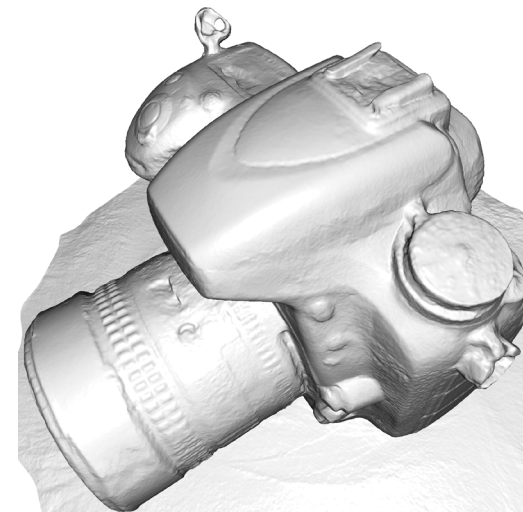
CMPMVS



OpenMVS



MVIR



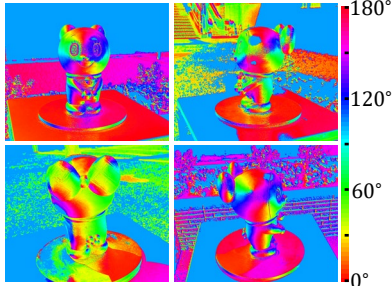
Polarimetric MVIR (Ours)

Statue: Our results

- 43 views



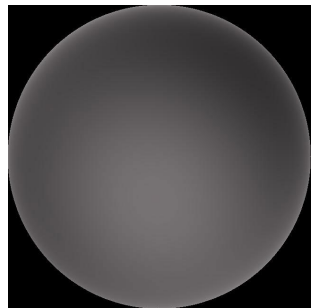
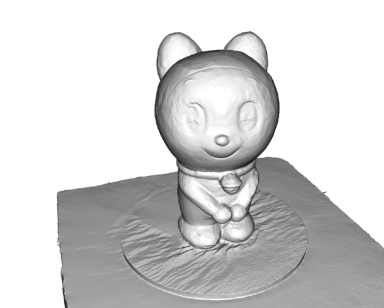
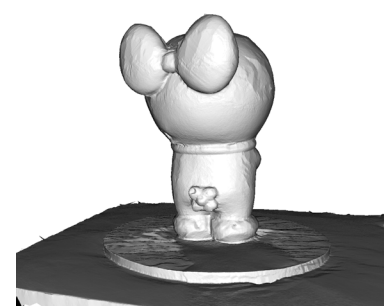
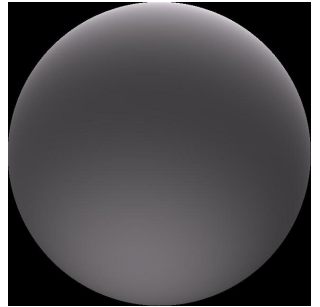
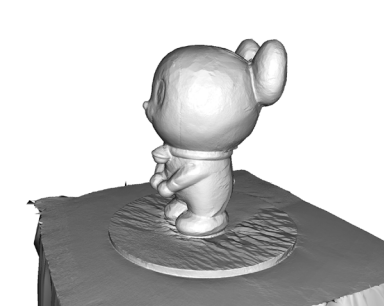
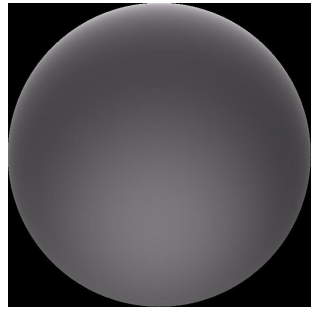
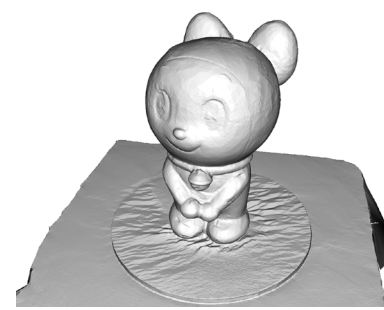
RGB images



AoP images



Estimated camera poses



Input image

Estimated albedo

Estimated shape

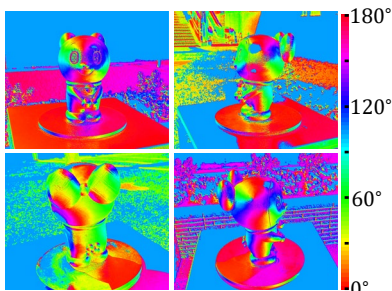
Estimated illumination

Statue: Comparison

- 43 views



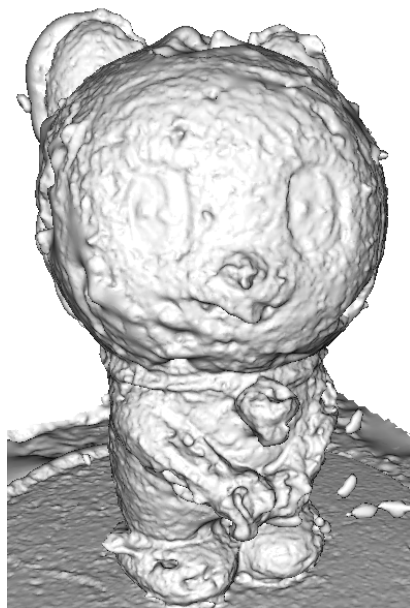
RGB images



AoP images



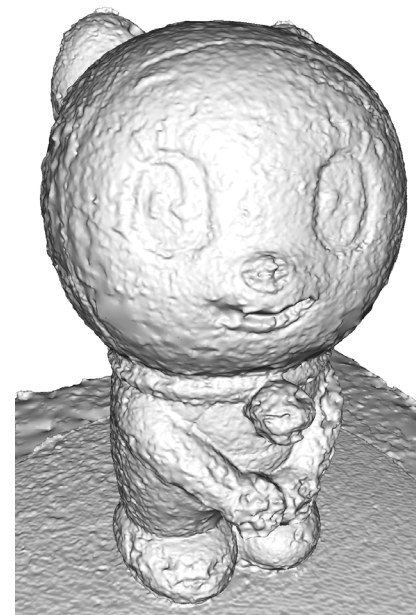
Estimated camera poses



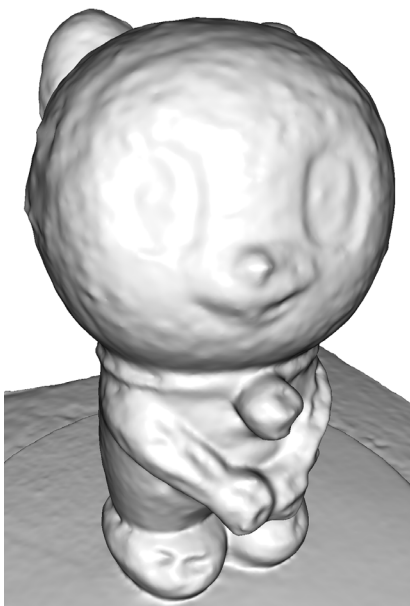
PMVS



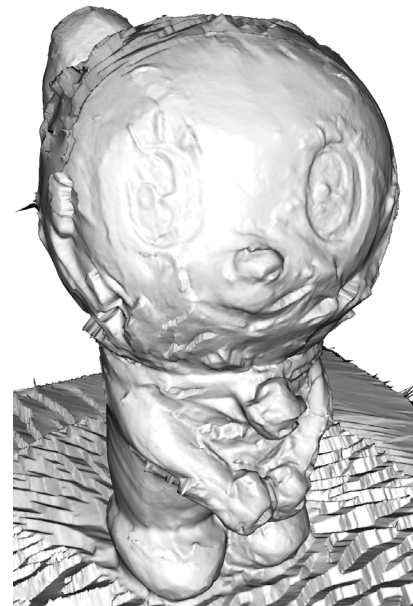
COLMAP+Poisson



CMPMVS



OpenMVS



MVIR



Polarimetric MVIR (Ours)