

Appendix

Table 1: The color contrast and shape complexity of different categories in MAD dataset.

Category	01	02	03	04	05
Color Contrast	73.45	35.71	49.22	41.84	35.69
Shape Complexity	65.79	57.9	24.53	100	81.58
Category	06	07	08	09	10
Color Contrast	71.38	74.59	35.41	40.98	54.35
Shape Complexity	11.25	46.23	73.97	55.97	23.92
Category	11	12	13	14	15
Color Contrast	52.34	86.32	66.15	55.10	32.85
Shape Complexity	42.43	43.77	29.49	28.18	56.1
Category	16	17	18	19	20
Color Contrast	61.28	36.18	58.10	37.75	35.98
Shape Complexity	0	49.76	15.53	62.18	79.03

Table 2: Results for pixel-level AUROC / pixel-level AP / image-level AUROC on MAD dataset using IGSPAD.

MPS	✗	✓
Feature Extractor	sam_b	sam_b
Gorilla	0.9971/0.6388/0.9285	0.9984/0.8099/0.9611
Unicorn	0.9982/0.6624/0.9995	0.9993/0.8531/0.9974
Mallard	0.9988/0.853/1	0.9992/0.9027/0.9996
Turtle	0.9941/0.3877/0.9934	0.9987/0.857/0.9906
Whale	0.998/0.6449/0.9546	0.999/0.844/0.9633
Bird	0.9874/0.3829/0.9722	0.9898/0.4288/0.9988
Owl	0.9951/0.4828/0.9279	0.998/0.7502/0.9848
Sabertooth	0.9993/0.8286/0.9911	0.9994/0.8644/0.9963
Swan	0.9952/0.5695/0.9726	0.9971/0.7778/0.9722
Sheep	0.9931/0.3924/0.9097	0.9941/0.4724/0.9418
Pig	0.9988/0.7028/0.9758	0.9989/0.7404/0.9806
Zalika	0.9935/0.4738/0.8973	0.9954/0.6172/0.9258
Pheonix	0.9987/0.8225/0.974	0.999/0.8537/0.9838
Elephant	0.9966/0.8491/0.9988	0.9978/0.9017/0.9973
Parrot	0.9989/0.8754/0.979	0.9992/0.9046/0.9898
Cat	0.9963/0.5492/0.9282	0.9986/0.736/0.9773
Scorpion	0.9893/0.3496/0.9995	0.9891/0.3714/1
Obesobeso	0.9943/0.4737/0.9369	0.998/0.749/0.9441
Bear	0.9991/0.8322/0.9982	0.9993/0.8627/0.9992
Puppy	0.9983/0.7162/0.9883	0.9989/0.81/0.9887
Mean	0.996/0.6244/0.9663	0.9974/0.7553/0.9796

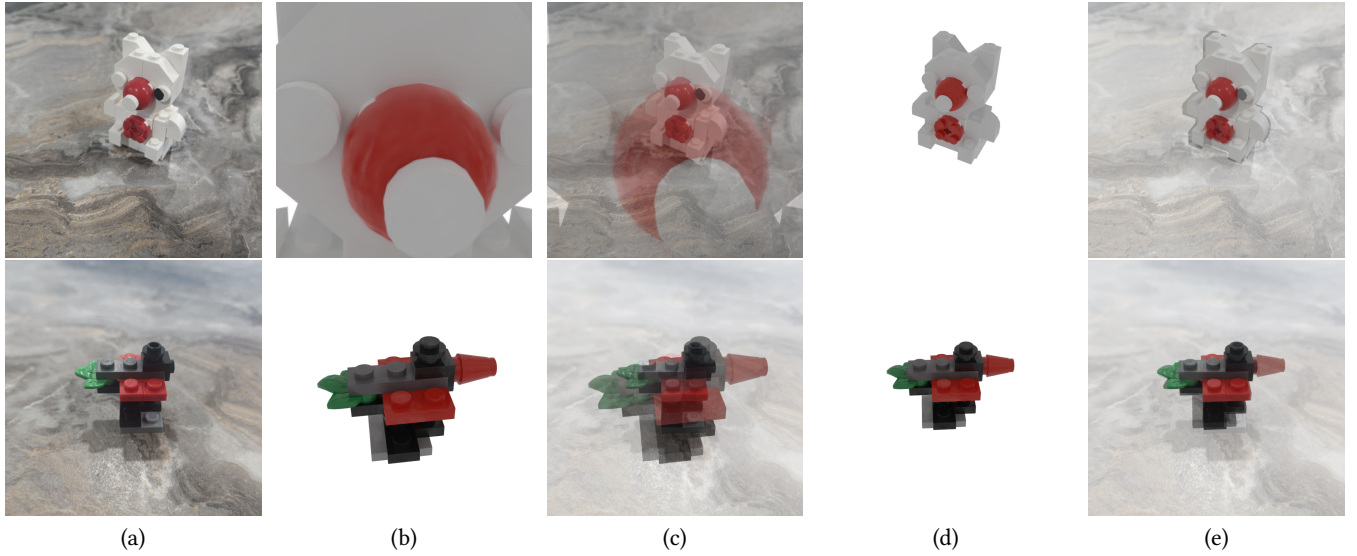


Figure 1: The rendering results in real scenario with or without MPS. (a) is the test images, (b) and (c) are images rendered without MPS, (d) and (e) are images rendered with MPS.

Table 3: Results for pixel-level AUROC / pixel-level AP / image-level AUROC on MAD dataset using IGSPAD.

MPS	✓	✓	✓	✓
Feature Extractor	resnet18	wide_resnet_50	CAIT	sam_b
Gorilla	0.9942/0.3742/0.924	0.9942/0.4929/0.9094	0.9762/0.0962/0.503	0.9984/0.8099/0.9611
Unicorn	0.9939/0.3702/0.9951	0.995/0.4287/0.9913	0.9904/0.2445/0.7604	0.9993/0.8531/0.9974
Mallard	0.9949/0.551/0.9906	0.9946/0.57/0.9991	0.9891/0.3089/0.6506	0.9992/0.9027/0.9996
Turtle	0.9707/0.1523/0.8164	0.9865/0.385/0.9421	0.9761/0.1443/0.325	0.9987/0.857/0.9906
Whale	0.9928/0.4089/0.953	0.9948/0.5049/0.9627	0.9858/0.2774/0.6335	0.999/0.844/0.9633
Bird	0.989/0.3433/0.9562	0.9891/0.3723/0.9954	0.9893/0.2976/0.8171	0.9898/0.4288/0.9988
Owl	0.9837/0.2505/0.8805	0.988/0.2782/0.9273	0.9768/0.0997/0.654	0.998/0.7502/0.9848
Sabertooth	0.9865/0.2908/0.9311	0.9906/0.3367/0.952	0.984/0.1493/0.5176	0.9994/0.8644/0.9963
Swan	0.9902/0.3224/0.9212	0.9873/0.301/0.927	0.9872/0.2606/0.6742	0.9971/0.7778/0.9722
Sheep	0.988/0.2402/0.8823	0.9817/0.2721/0.9463	0.9884/0.2165/0.6635	0.9941/0.4724/0.9418
Pig	0.9971/0.4799/0.9624	0.9956/0.4749/0.9632	0.9946/0.326/0.6846	0.9989/0.7404/0.9806
Zalika	0.9841/0.306/0.8711	0.9859/0.3413/0.9093	0.9754/0.1962/0.5417	0.9954/0.6172/0.9258
Pheonix	0.9949/0.5138/0.9391	0.9926/0.492/0.9515	0.9929/0.3968/0.7647	0.999/0.8537/0.9838
Elephant	0.9937/0.5646/0.9933	0.9937/0.6063/0.9884	0.9892/0.5383/0.7335	0.9978/0.9017/0.9973
Parrot	0.9948/0.5142/0.9834	0.9934/0.5153/0.9675	0.991/0.4392/0.7035	0.9992/0.9046/0.9898
Cat	0.9925/0.3163/0.9062	0.9928/0.3883/0.9513	0.9921/0.2174/0.7249	0.9986/0.736/0.9773
Scorpion	0.9837/0.2479/0.9827	0.9857/0.3096/0.9923	0.972/0.1269/0.7603	0.9891/0.3714/1
Obesobeso	0.9899/0.3011/0.9192	0.9907/0.3782/0.9325	0.99/0.2635/0.6408	0.998/0.749/0.9441
Bear	0.9941/0.43/0.9837	0.9915/0.4437/0.9881	0.9888/0.2793/0.6606	0.9993/0.8627/0.9992
Puppy	0.9912/0.3383/0.9482	0.991/0.3399/0.9652	0.9839/0.1968/0.717	0.9989/0.81/0.9887
Mean	0.989995/0.365795/0.936985	0.9907/0.4116/0.9581	0.9857/0.2523/0.6565	0.9974/0.7553/0.9796

Table 4: Results for pixel-level AUROC / pixel-level AP / image-level AUROC on MAD dataset using IGSPAD.

MPS	✓	✓	✓
Feature Extractor	sam_b	sam_l	sam_h
Gorilla	0.9984/0.8099/0.9611	0.998/0.75/0.9501	0.9977/0.742/0.9284
Unicorn	0.9993/0.8531/0.9974	0.9992/0.8221/0.9995	0.9992/0.8321/0.9995
Mallard	0.9992/0.9027/0.9996	0.9989/0.8648/0.9998	0.999/0.8765/1
Turtle	0.9987/0.857/0.9906	0.9986/0.8307/0.9877	0.9987/0.84/0.9934
Whale	0.999/0.844/0.9633	0.9988/0.8051/0.9595	0.9988/0.8164/0.9545
Bird	0.9898/0.4288/0.9988	0.99/0.4091/0.997	0.9894/0.4294/0.9958
Owl	0.998/0.7502/0.9848	0.9976/0.6985/0.9806	0.9977/0.7145/0.9785
Sabertooth	0.9994/0.8644/0.9963	0.9993/0.8241/0.9944	0.9993/0.8286/0.9911
Swan	0.9971/0.7778/0.9722	0.9956/0.7328/0.9714	0.9967/0.7427/0.9724
Sheep	0.9941/0.4724/0.9418	0.9944/0.4342/0.9463	0.9946/0.4625/0.9474
Pig	0.9989/0.7404/0.9806	0.9987/0.6908/0.9822	0.9988/0.7044/0.9758
Zalika	0.9954/0.6172/0.9258	0.9949/0.5855/0.9232	0.9951/0.5981/0.9188
Pheonix	0.999/0.8537/0.9838	0.9987/0.814/0.9819	0.9987/0.8225/0.974
Elephant	0.9978/0.9017/0.9973	0.998/0.8736/0.9976	0.9976/0.885/0.9988
Parrot	0.9992/0.9046/0.9898	0.999/0.8743/0.9849	0.9989/0.8754/0.979
Cat	0.9986/0.736/0.9773	0.9985/0.7007/0.9834	0.9985/0.7165/0.9855
Scorpion	0.9891/0.3714/1	0.9892/0.3409/0.9998	0.9893/0.3496/0.9995
Obesobeso	0.998/0.749/0.9441	0.9972/0.7008/0.9396	0.9972/0.7072/0.949
Bear	0.9993/0.8627/0.9992	0.9991/0.8266/0.9993	0.9991/0.8359/0.9982
Puppy	0.9989/0.81/0.9887	0.9987/0.7716/0.9894	0.9987/0.7835/0.9883
Mean	0.9974/0.7553/0.9796	0.9971/0.7175/0.9784	0.9971/0.7281/0.9764