Table 6: **OOD detection results (TNR at 95% TPR, AUROC) under more severe background bias.** In-distribution dataset is the colored MNIST dataset in Ming et al. [58] with $r = 0.45$. The result in Ming et al. [58] is included for reference. Higher is better in all metrics.

Method	Spurious OOD dataset	LSUN	iSUN	Textures
Ming et al. [58]	0.696/0.867	0.901/0.959	0.933/0.982	0.937/0.985
Projection Regret	0.958/0.990	1.000/1.000	1.000/1.000	1.000/1.000

Table 7: **One-class classification results (AUROC) of Projection Regret against various baselines in the CIFAR-10 one-class classification task. Bold** denotes the best method.

Method	Category	Plane	Car	Bird	Cat	Deer	Dog	Frog	Horse	Ship	Truck	Mean
MemAE [59]	Autoencoder											0.609
AnoGAN [60]	GAN	0.671	0.547	0.529	0.545	0.651	0.603	0.585	0.625	0.758	0.665	0.618
OCGAN [61]	GAN	0.757	0.531	0.640	0.620	0.723	0.620	0.723	0.575	0.820	0.554	0.657
DROCC [62]	Adversarial Generation	0.817	0.767	0.667	0.671	0.736	0.744	0.744	0.714	0.800	0.762	0.742
P-KDGAN [63]	GAN	0.825	0.744	0.703	0.605	0.765	0.652	0.797	0.723	0.827	0.735	0.738
LMD [18]	Diffusion Model	0.770	0.801	0.719	0.506	0.790	0.625	0.793	0.766	0.740	0.760	0.727
Projection Regret **(ours)**	Diffusion Model	**0.864**	**0.946**	**0.789**	**0.697**	**0.840**	**0.825**	**0.854**	**0.889**	**0.929**	**0.919**	**0.855**

Table 8: **OOD detection results (TNR at 95% TPR, AUROC) in LSUN.** Experiment is conducted in the LSUN dataset with bedroom as in-distribution. OOD datasets are bridge/church/classroom.

Method	bridge	church	classroom
LMD [18]	0.033/0.386	0.060/0.379	0.007/0.336
Projection Regret	0.443/0.830	0.253/0.772	0.120/0.696

Table 9: **OOD detection results (AUROC) under the corrupted in-distribution data.** In-distribution dataset is CIFAR-10 and OOD datasets are SVHN/CIFAR-100/LSUN/ImageNet. We denote level 0 as the performance of Projection Regret in uncorrupted in-distribution dataset.

Noise type	level 0	level 1	level 2	level 3
Shot noise	0.993/0.775/0.836/0.813	0.972/0.641/0.700/0.682	0.936/0.526/0.577/0.566	0.811/0.310/0.336/0.339
Defocus blur	0.993/0.775/0.836/0.813	0.992/0.760/0.822/0.800	0.990/0.723/0.790/0.766	0.986/0.666/0.735/0.711
Fog	0.993/0.775/0.836/0.813	0.989/0.701/0.769/0.745	0.980/0.570/0.641/0.620	0.969/0.480/0.543/0.529
Elastic	0.993/0.775/0.836/0.813	0.989/0.693/0.763/0.738	0.989/0.692/0.762/0.737	0.987/0.659/0.731/0.706

Figure 5: **Different types of corruption.** Original CIFAR-10 data and its corruption. From left, original data, shot noise, defocus blur, fog, and elastic transform. The corruption level is 3.

Table 10: **Results with different OOD detection metrics.** In-distribution dataset is the CIFAR-10 dataset. We report AUROC, TNR at 95% TPR, detection accuracy, AUPR_IN, and AUPR_OUT. Higher is better in all metrics.

Method	SVHN	CIFAR-100	LSUN	ImageNet
LMD [18]	0.979/0.890/0.924/0.955/0.992	0.620/0.112/0.591/0.602/0.612	0.734/0.206/0.678/0.722/0.721	0.686/0.168/0.637/0.674/0.677
Projection Regret	0.993/0.967/0.961/0.982/0.997	0.775/0.283/0.703/0.768/0.771	0.836/0.313/0.761/0.849/0.808	0.813/0.326/0.736/0.818/0.804

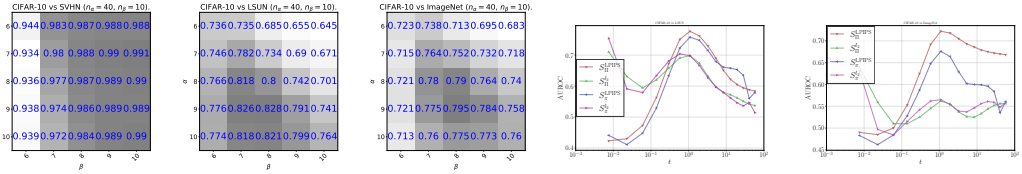

Figure 6: **Sensitivity analysis on Projection Regret.** Left three replicate Figure 4 in the SVHN **(left)**, LSUN **(middle)**, and ImageNet **(right)** datasets. Right two replicate Figure 3 in LSUN **(left)** and ImageNet **(right)** datasets. In-distribution is the CIFAR-10 dataset.