S3R-Net: A Single-Stage Approach to Self-Supervised Shadow Removal

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BBC

What is S3R-Net?

➔ a new *unify-and-adapt* self-supervised shadow removal network that does NOT:
- a) require a CycleGAN / paired task
- b) use domain-specific priors
- c) rely on extra shadow masks

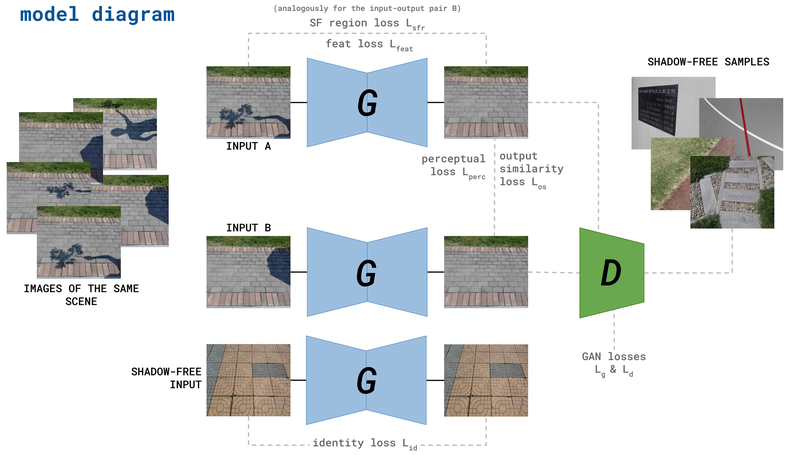
What does it offer?

➔ superior visual performance: good brightness adjustment & imperceptible shadow residuals/boundaries

➔ numerical performance similar to SOTA

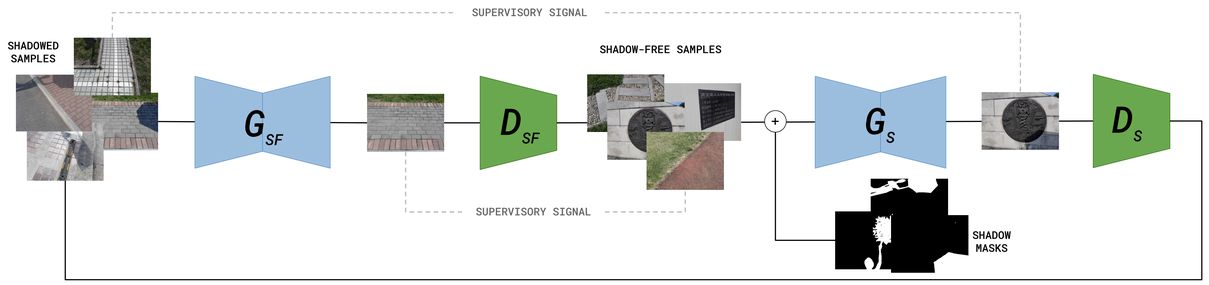
➔ low computational cost and GFLOPS

S3R-Net model diagram

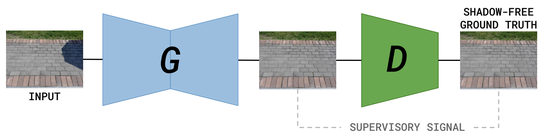


Approaches to supervision

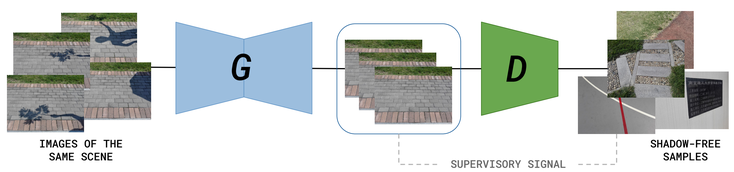
CycleGAN → SELF-SUPERVISION THROUGH CYCLE CONSISTENCY



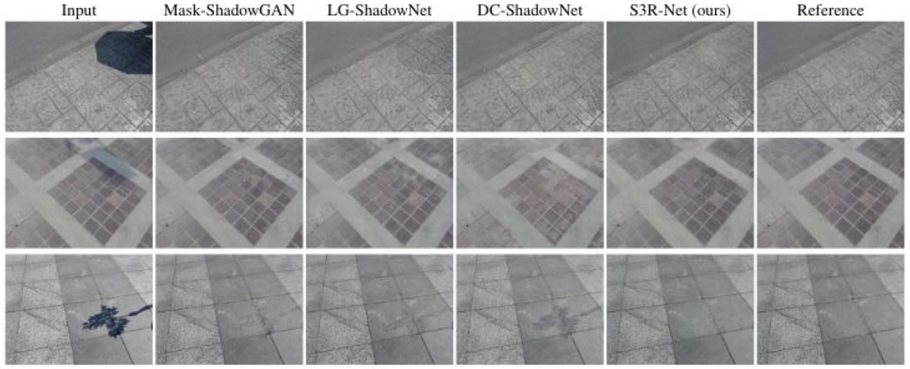
Supervised shadow removal



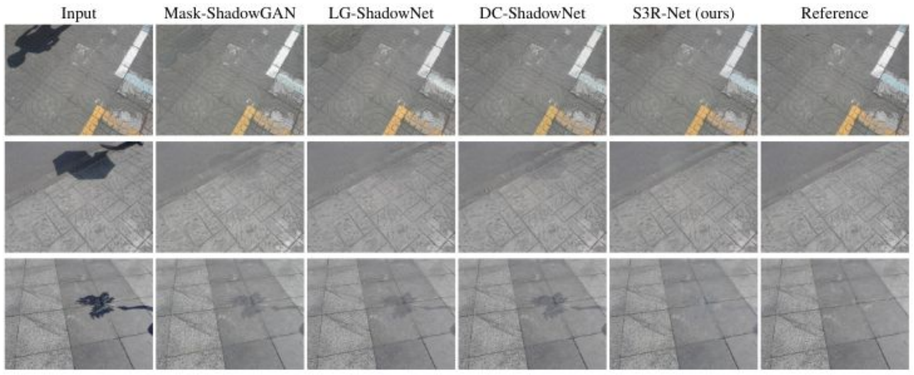
S3R-Net (ours) → *UNIFY-AND-ADAPT* SELF-SUPERVISION



Results on ISTD



Results on AISTD



Quantitative SOTA comparisons

Dataset	Model	RMSE(A)↓	RMSE(S)↓	RMSE(NS) ↓
ISTD	Mask-ShadowGAN	7.32	12.65	6.57
	LG-ShadowNet	6.67	11.63	5.91
	DC-ShadowGAN	7.36	11.21	6.64
	S3R-Net (ours)	7.12	12.16	6.38
AISTD	Mask-ShadowGAN	5.84	12.28	4.82
	LG-ShadowNet	5.02	10.64	4.02
	DC-ShadowGAN	5.64	12.63	4.33
	S3R-Net (ours)	5.71	12.86	4.43

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