

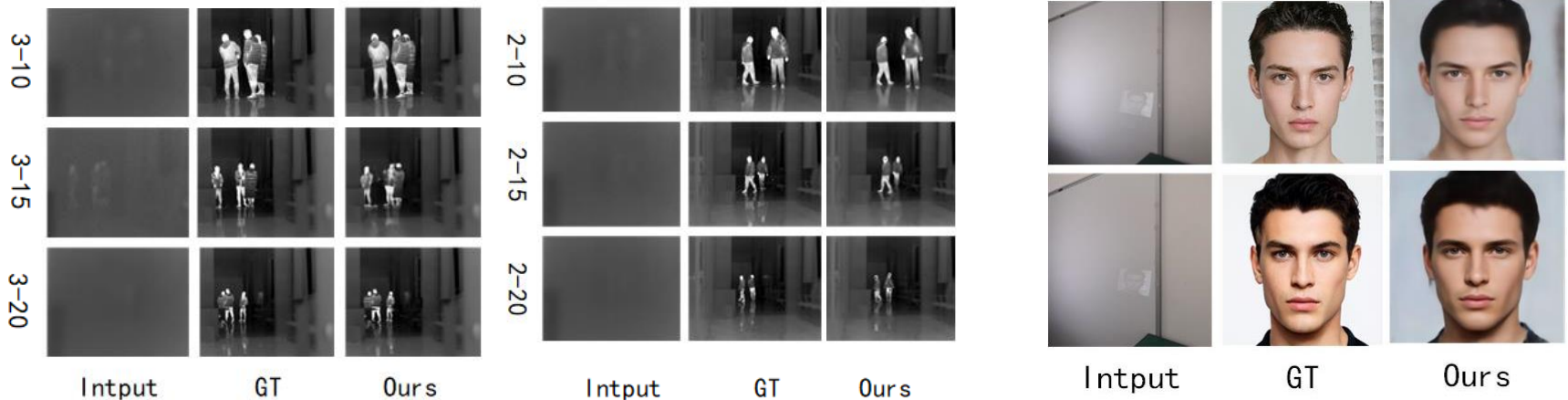
Multiple-Object Passive Non-Line-of-Sight Imaging

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Problems & Ideas

- Problems of conventional stereo matching approaches:
 - Most existing methods focus on 2D scene reconstruction.
 - Deep learning approaches face challenges in multi-target reconstruction.
- Ideas: A passive NLOS imaging model, UNet MultiAttention (UMA), for multi-target complex scenes.



(Left) Three target hidden scene reconstruction results; (Middle) dual target hidden scene reconstruction results; (Right) chaomo dataset reconstruction results.

Main Contributions

- Contributions:
 - We propose a passive NLOS imaging model, UNet MultiAttention (UMA), for multi-target complex scenes. It can effectively restore complex scenes and extract target object information from projected images by enhancing and fusing features.
 - Supervise branch networks using joint loss functions to further improve reconstruction performance

Experimental results of UNet, Uformer, NLOS-OT, and UMA on the Infrared multi-object NLOS dataset.

Method	2-10		2-15		2-20		3-10		3-15		3-20	
	PSNR	SSIM	PSNR	SSIM	PSNR	SSIM	PSNR	SSIM	PSNR	SSIM	PSNR	SSIM
UNet	17.188	0.754	20.565	0.833	23.700	0.891	18.664	0.730	19.602	0.759	22.711	0.834
Uformer	19.961	0.869	22.289	0.853	22.134	0.895	20.782	0.897	23.925	0.845	25.346	0.915
NLOS-OT	21.158	0.866	24.884	0.911	27.973	0.941	21.380	0.862	22.126	0.844	24.619	0.893
Ours	22.004	0.879	25.768	0.927	28.872	0.954	23.460	0.909	24.156	0.903	25.868	0.950