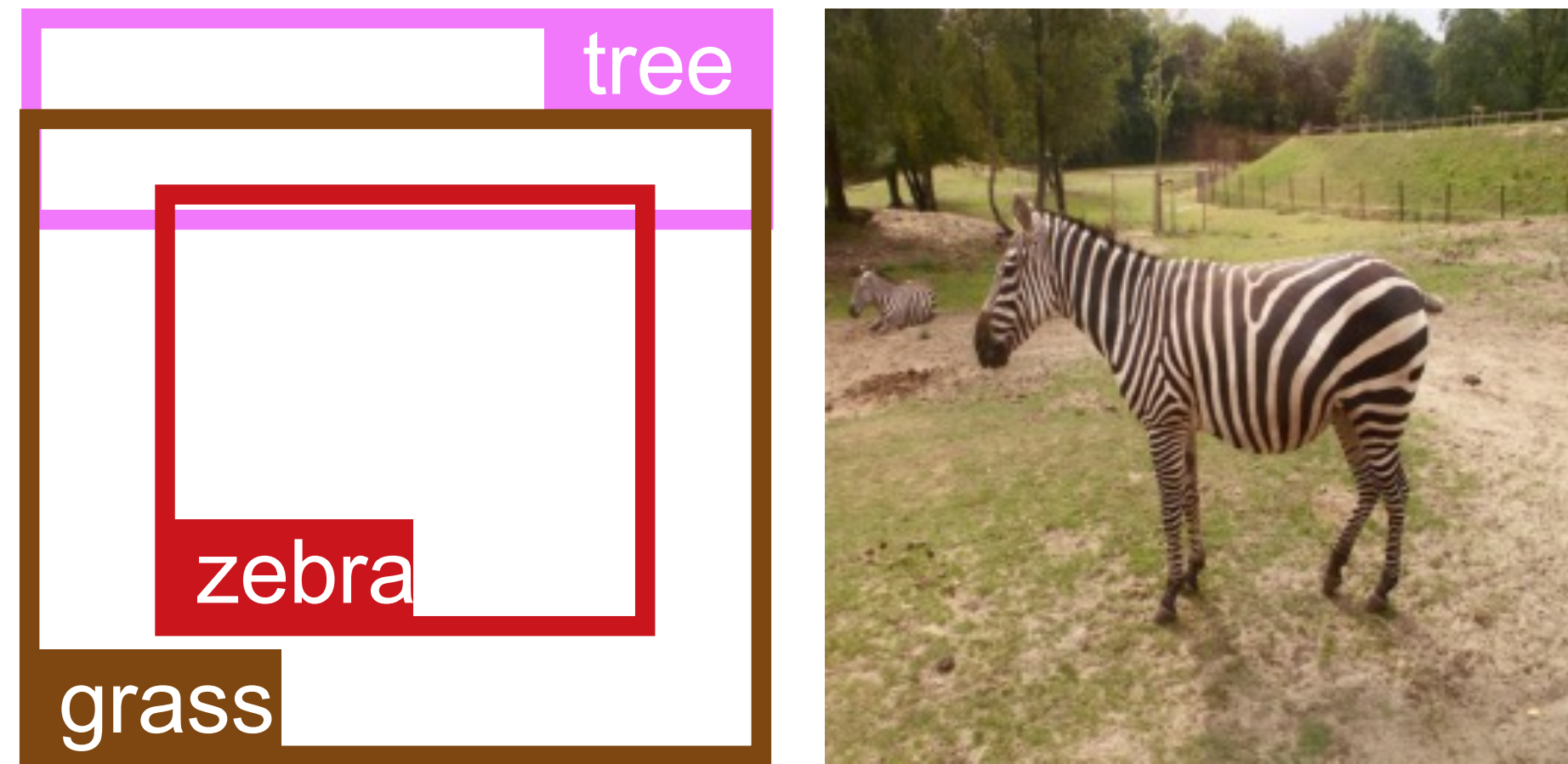
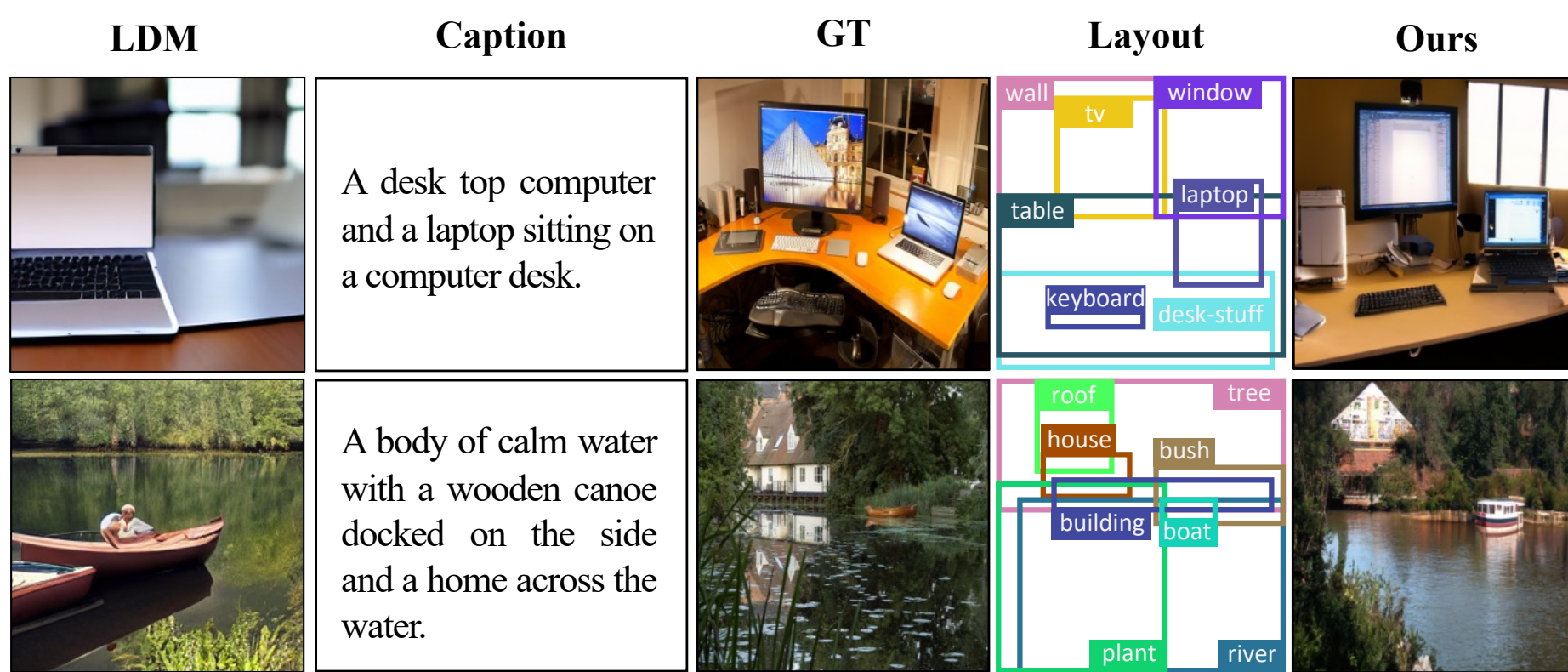


Problems

- ◆ **Keywords**
 - Layout-to-Image Generation
 - Layout-conditional Diffusion Model
- ◆ **What is Layout ?**
 - A set of objects
 - bounding box + object category.



Layout-guided vs. Text-guided Image Generation

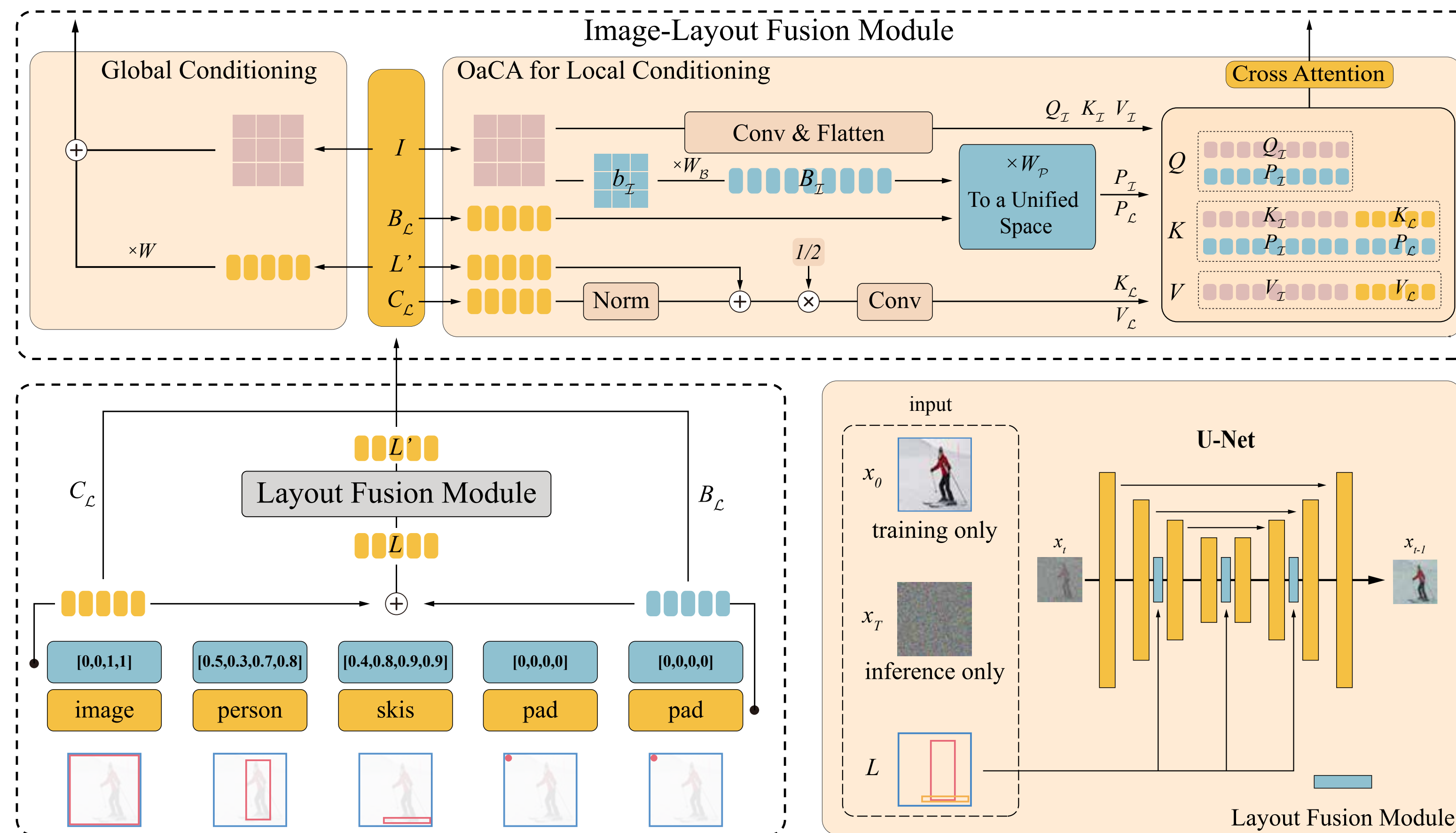
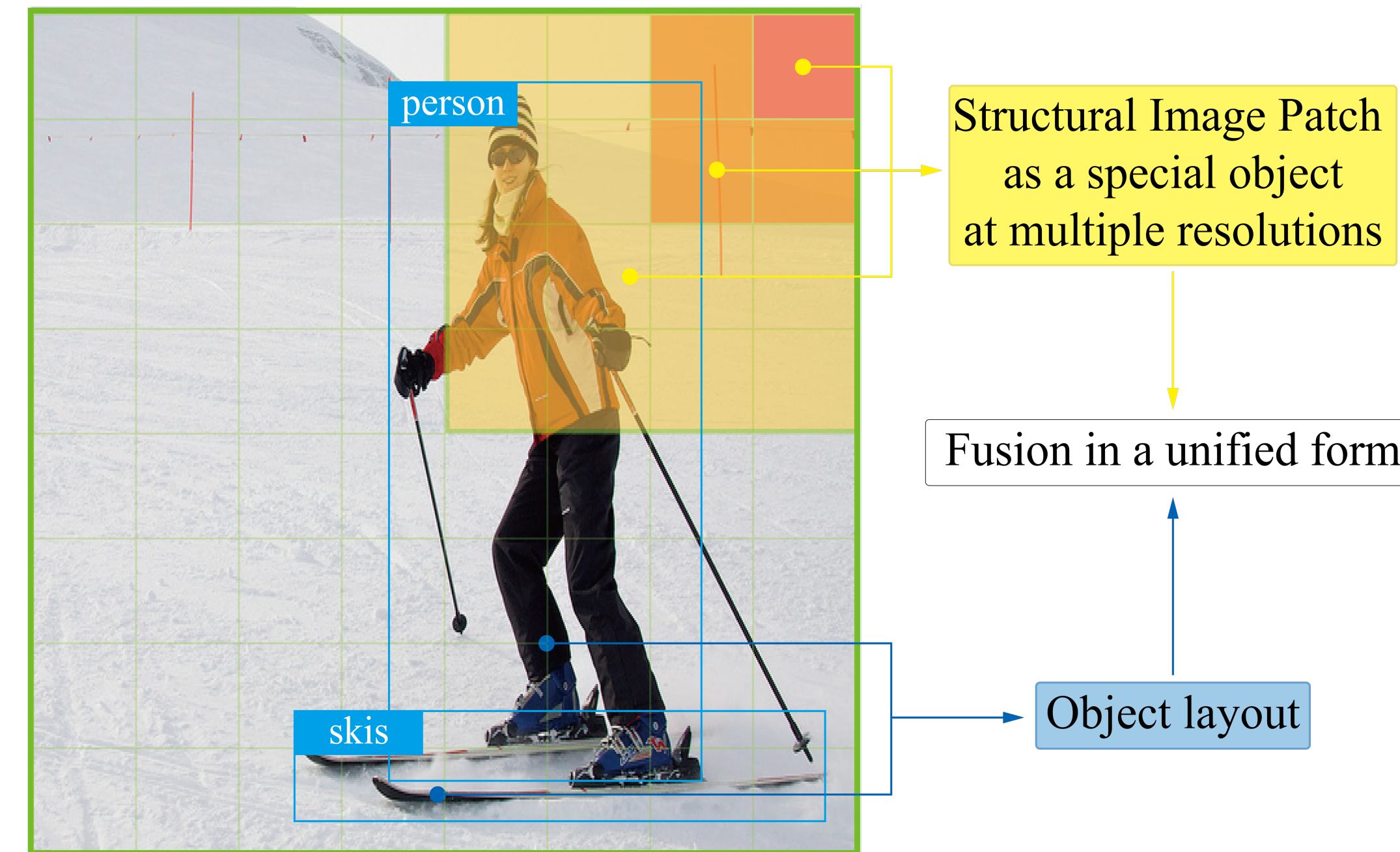


Objectives

- Controllable Generation by Layout Condition
- Diffusion Model instead of GAN
- Generation with both High-quality and Diversity
- Precise Control over the Position and Size

Methods

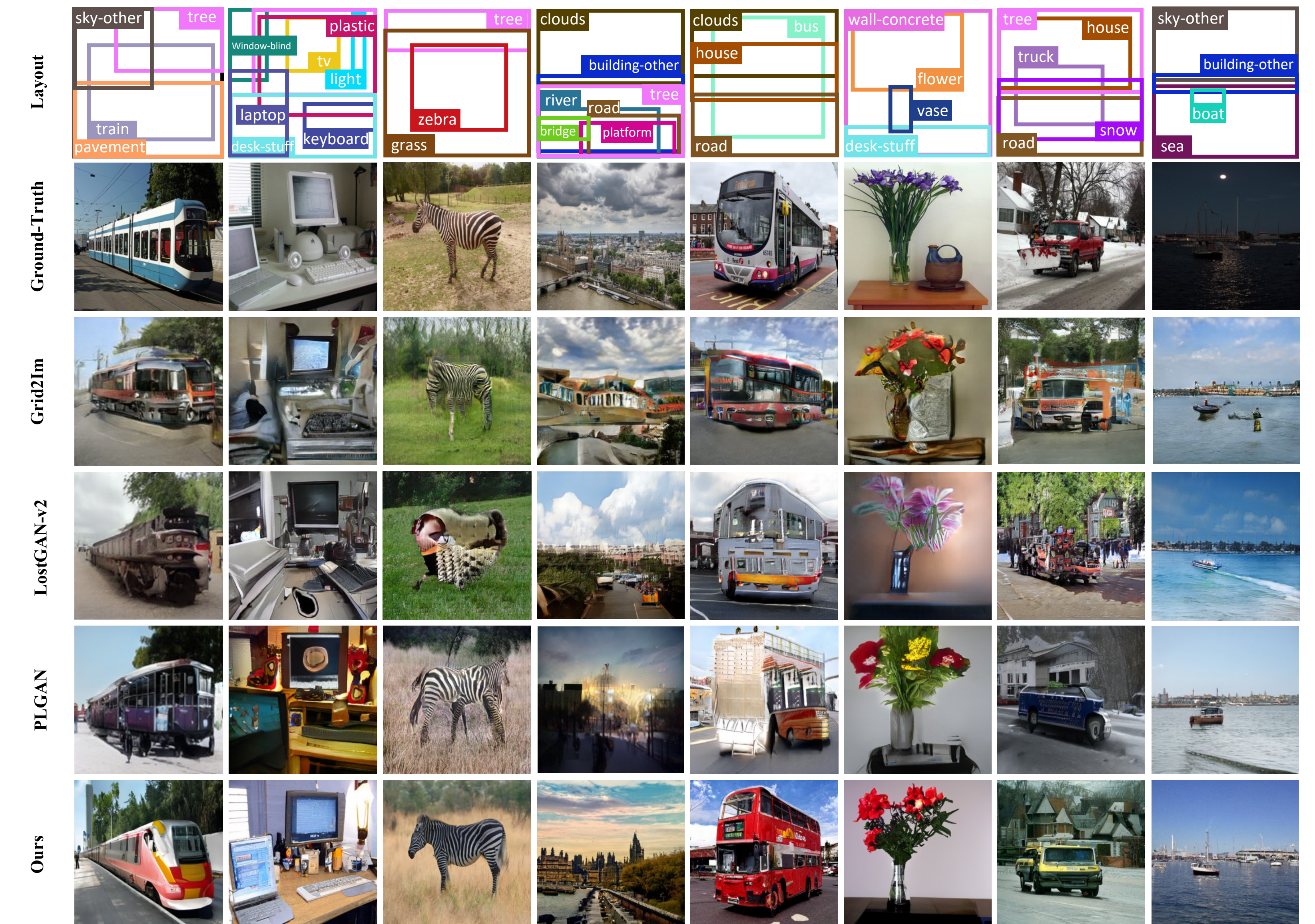
- ◆ **Image-Layout Fusion in a unified space**
 - Each Patch of Image → a Special Object
 - Patched Image → a Special Layout

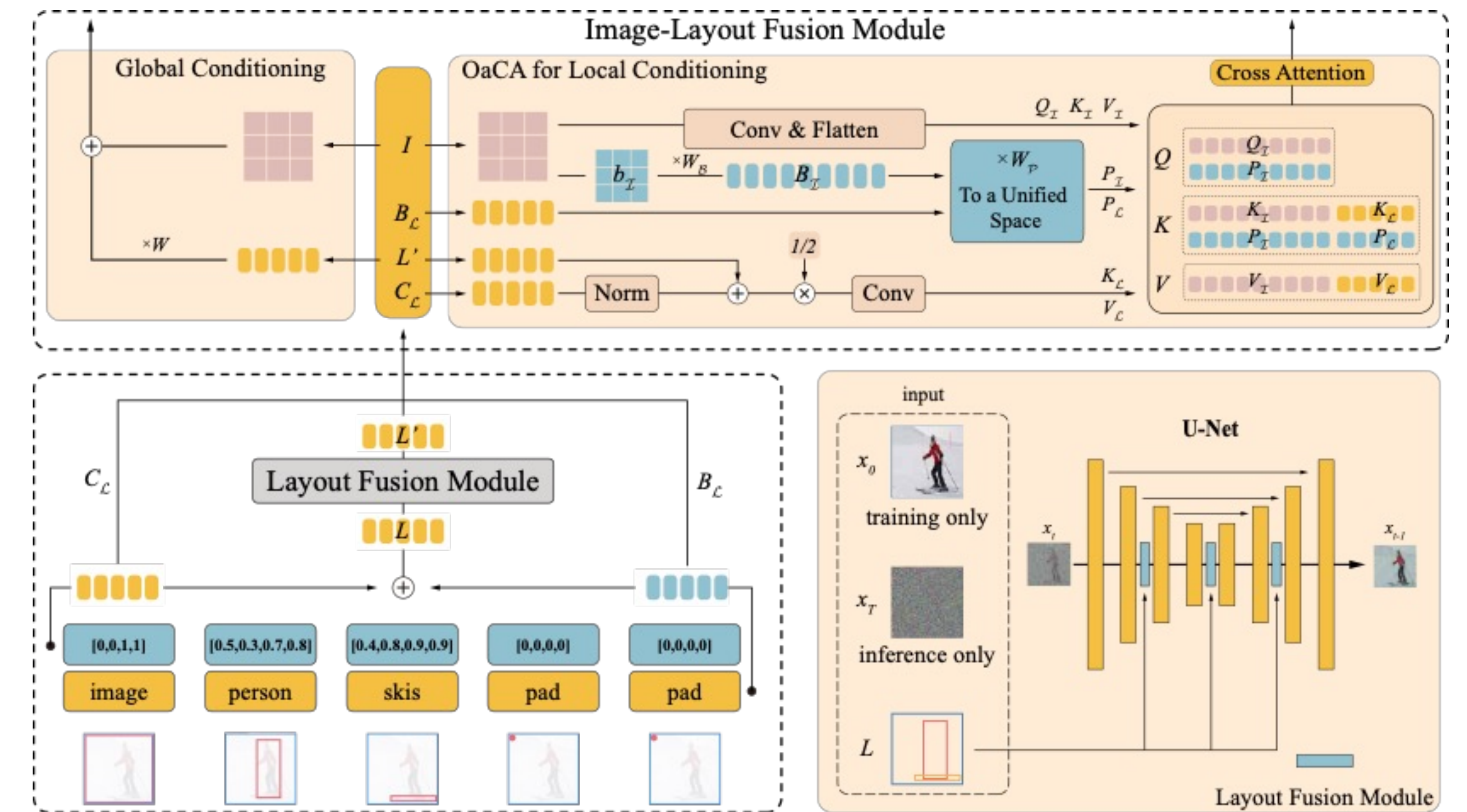
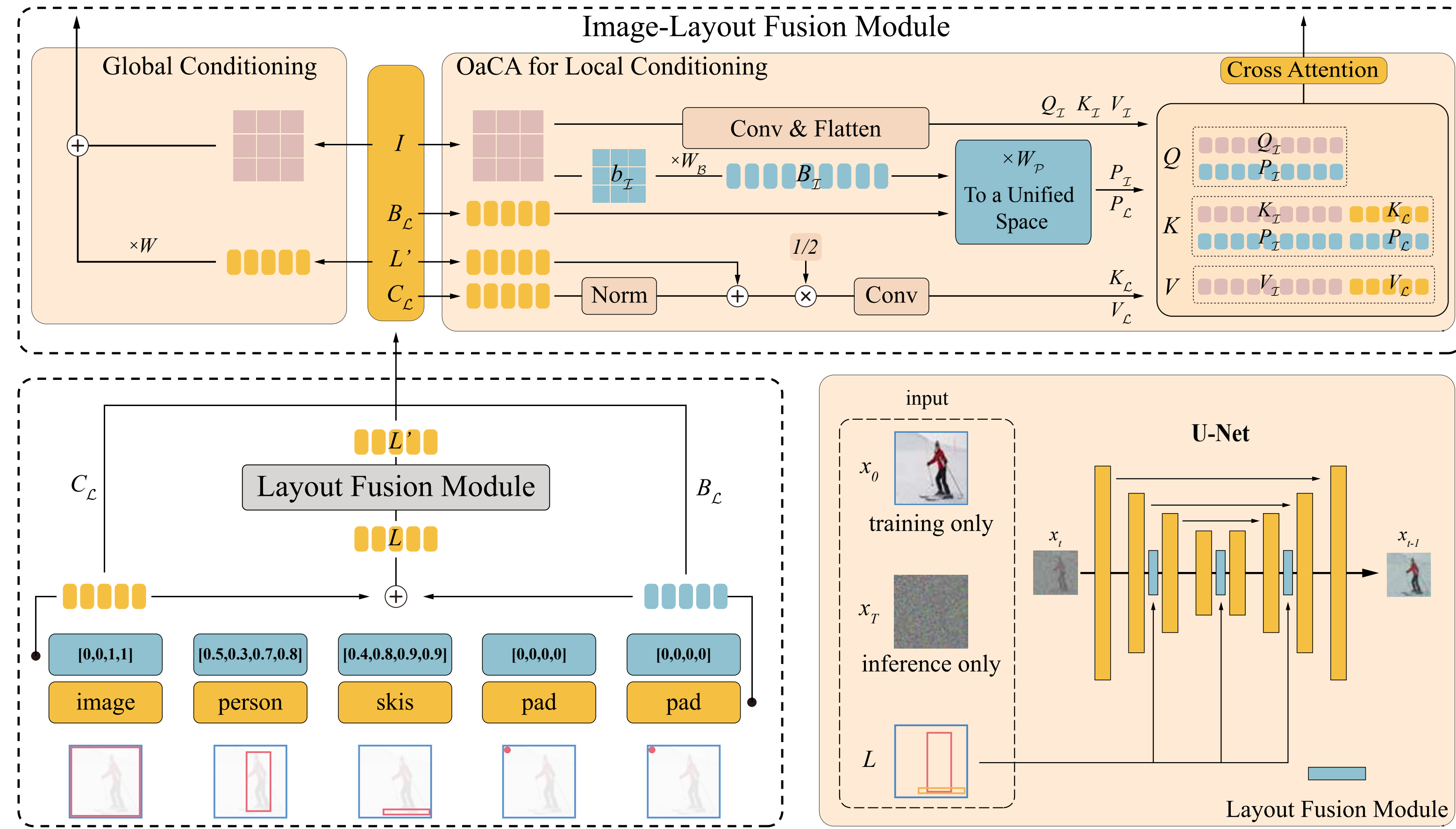




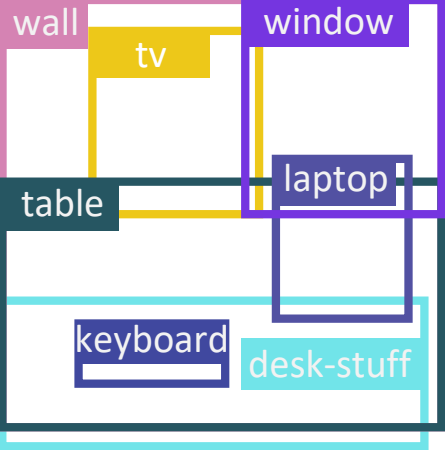



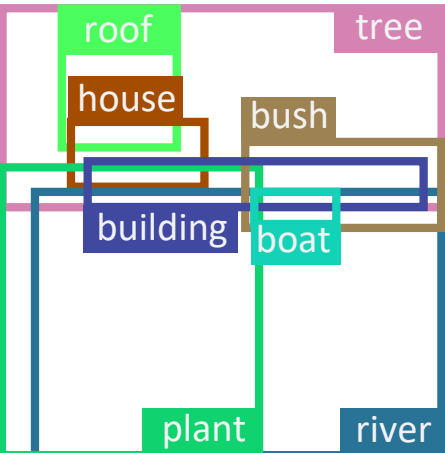

Results

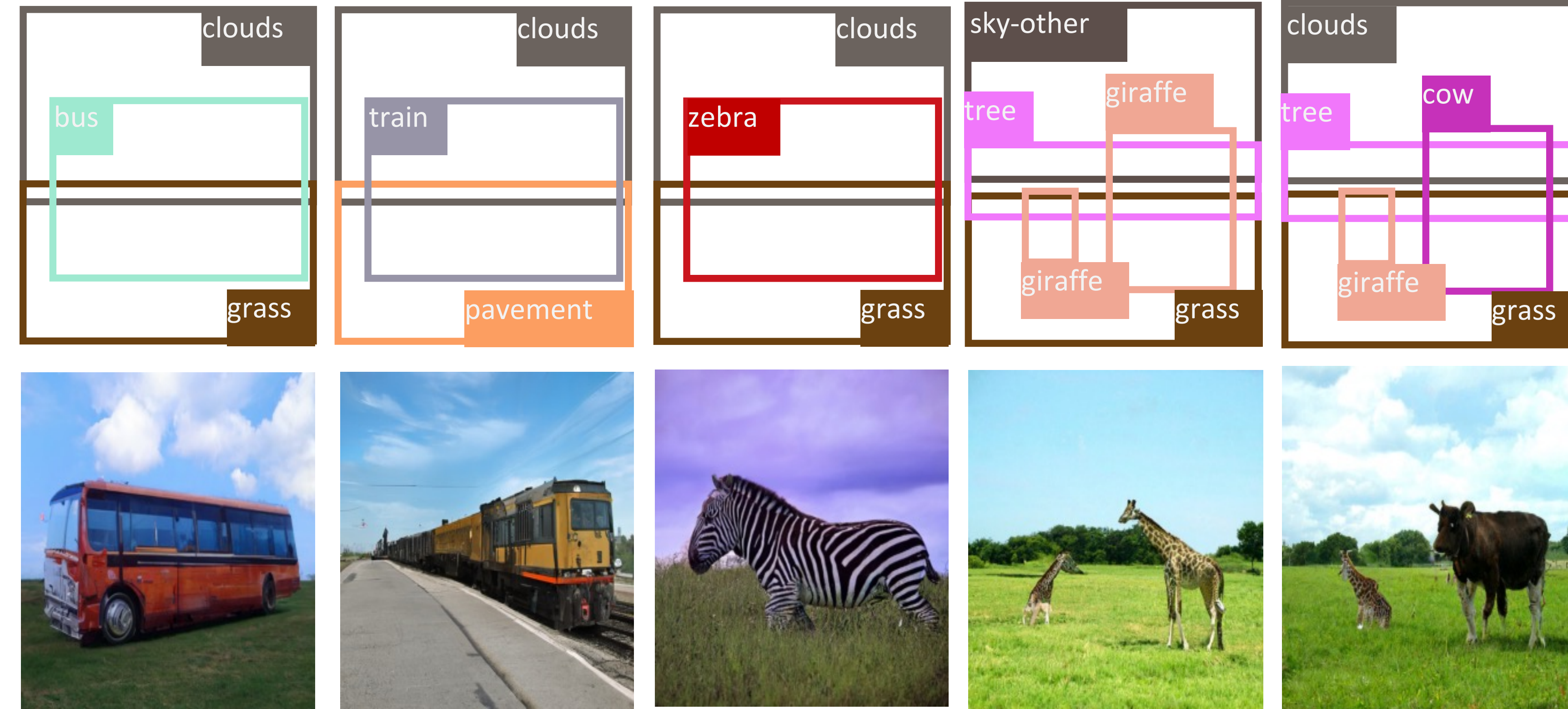
📊 State of the Art Layout-to-Image Generation on COCO-Stuff 256x256 📊 State of the Art Layout-to-Image Generation on Visual Genome 256x256

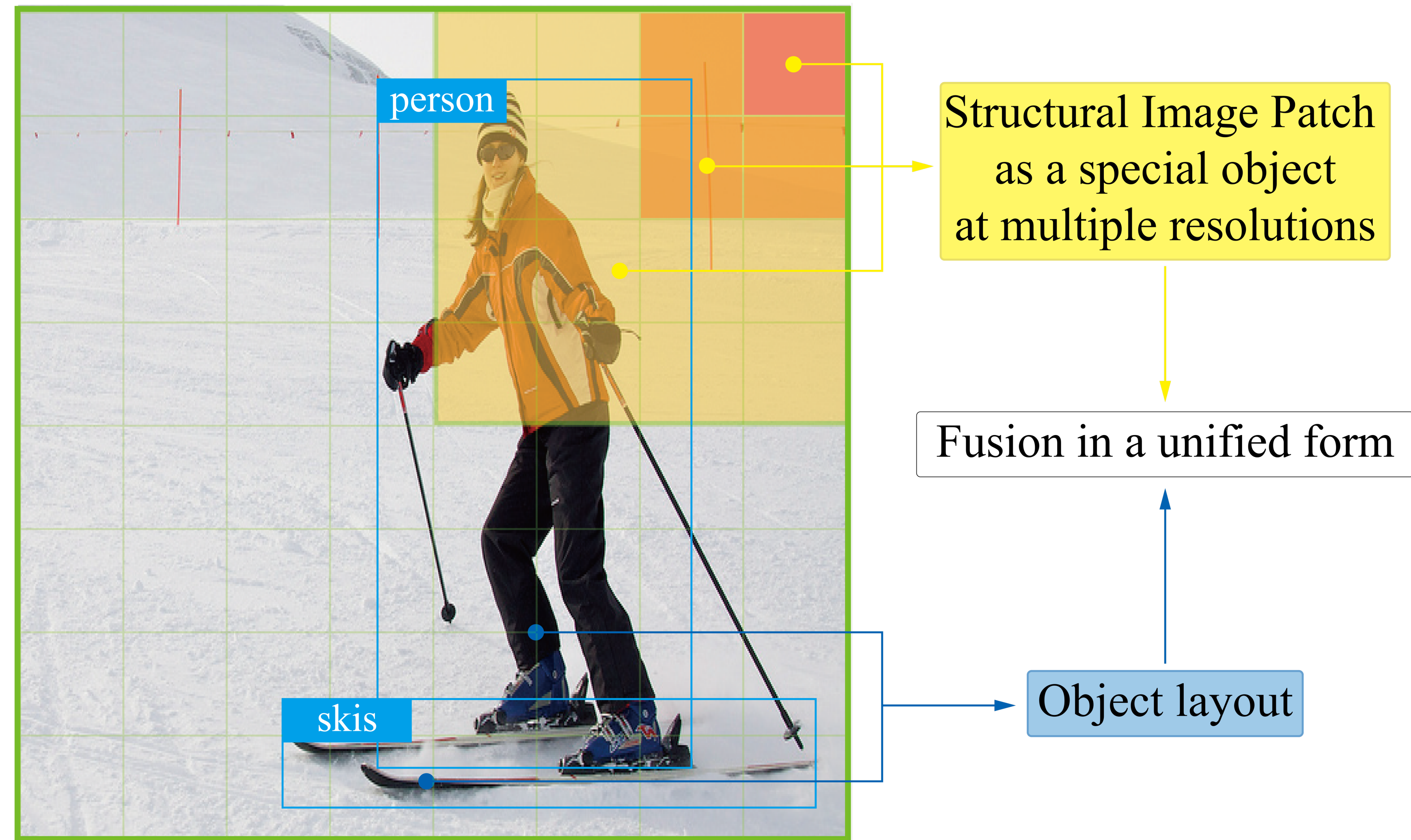
Methods	COCO-stuff					VG		
	FID ↓	IS ↑	DS ↑	CAS ↑	YOLOScore ↑	FID ↓	DS ↑	CAS ↑
128×128								
Grid2Im [2]	59.50	12.50±0.30	0.28±0.11	4.05	6.80	-	-	-
LostGAN-v2 [41]	24.76	14.21±0.40	0.45±0.09	39.91	13.60	29.00	0.42±0.09	29.74
PLGAN [45]	22.70	15.60±0.30	0.16±0.72	38.70	13.40	20.62	-	-
LayoutDiffusion	16.57	20.17±0.56	0.47±0.09	43.60	27.00	16.35	0.49±0.09	36.45
256×256								
Grid2Im [2]	65.20	16.40±0.70	0.34±0.13	4.81	9.70	-	-	-
LostGAN-v2 [41]	31.18	18.01±0.50	0.56±0.10	40.00	17.50	32.08	0.53±0.10	34.48
PLGAN [45]	29.10	18.90±0.30	0.52±0.10	37.65	14.40	28.06	-	-
LayoutDiffusion	15.61	28.36±0.75	0.57±0.10	47.74	32.00	15.63	0.59±0.10	48.90



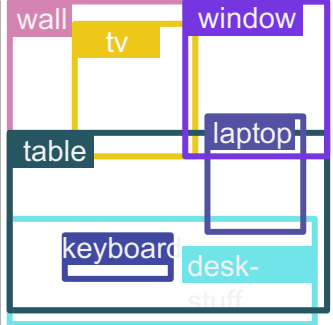






LDM	Caption	GT	Layout	Ours
	A desk top computer and a laptop sitting on a computer desk.			
	A body of calm water with a wooden canoe docked on the side and a home across the water.			





LDM	Caption	GT	Layout	Ours
	A desk top computer and a laptop sitting on a computer desk.			
	A body of calm water with a wooden canoe docked on the side and a home across the water.	