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☐ Code: ZGCTroy/LayoutDiffusion (github.com)

LayoutDiffusion: Controllable Diffusion Model for Layout-to-Image Generation

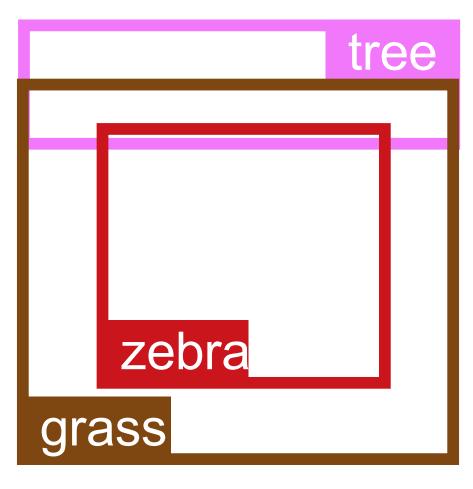
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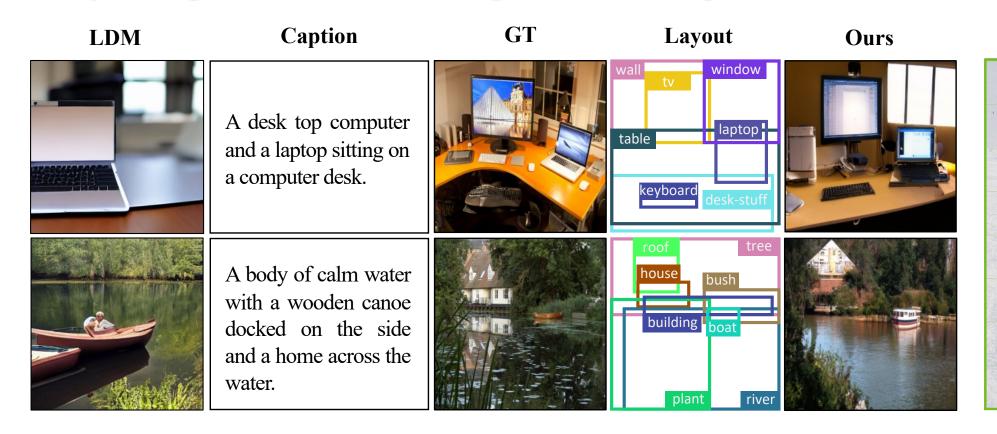
Problems

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





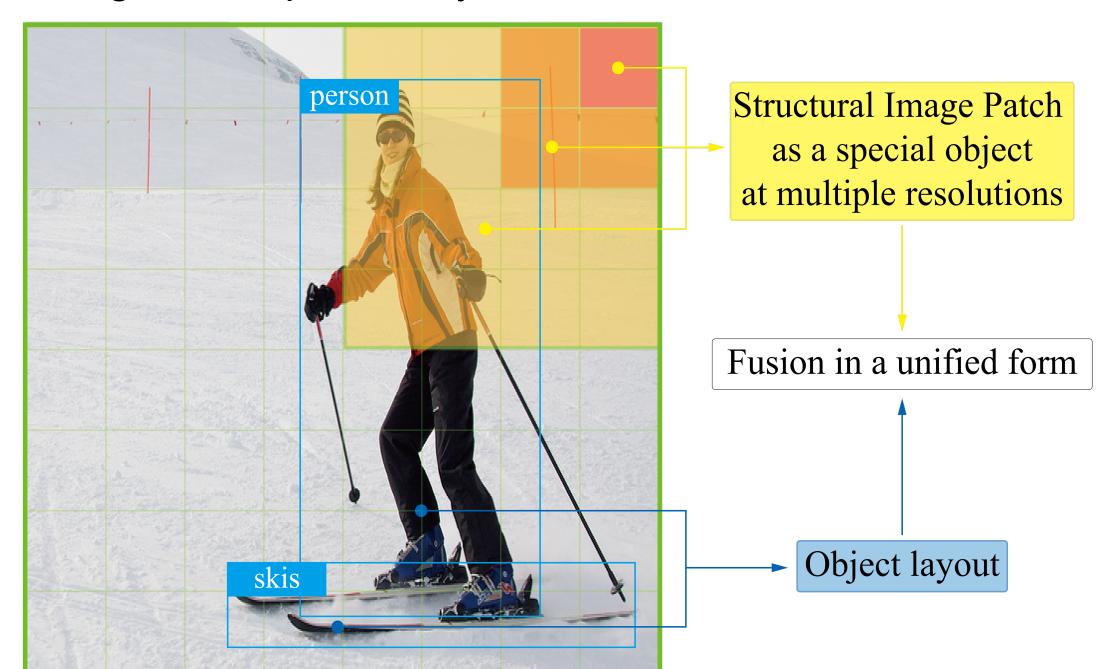
◆ Layout-guided vs. Text-guided Image Generation

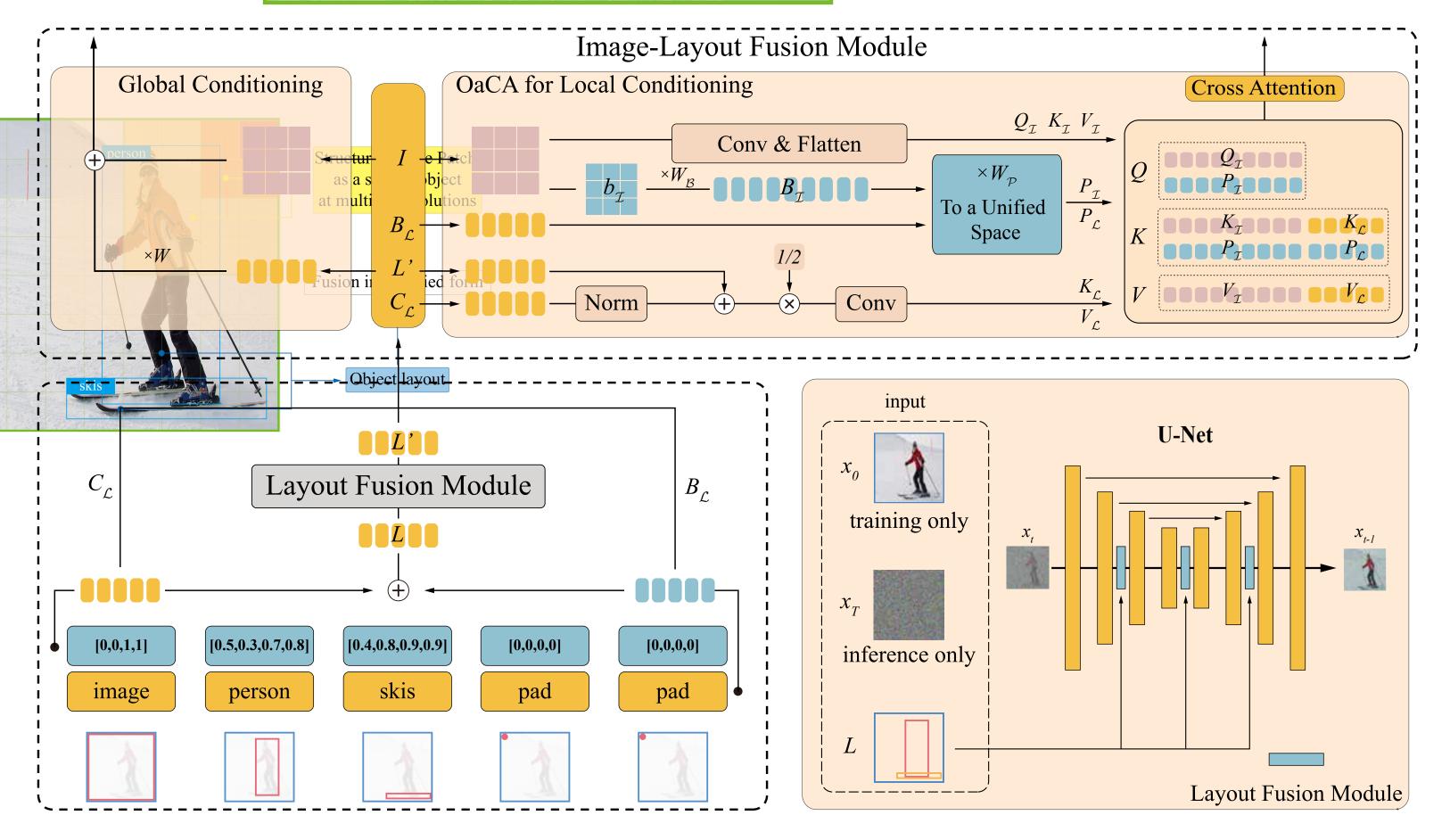


- Objectives
- Controllable Generation by Layout Condition
- Diffusion Model instead of GAN
- ☐ Generation with both High-quality and Diversity
- Precise Control over the Position and Size

Methods

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

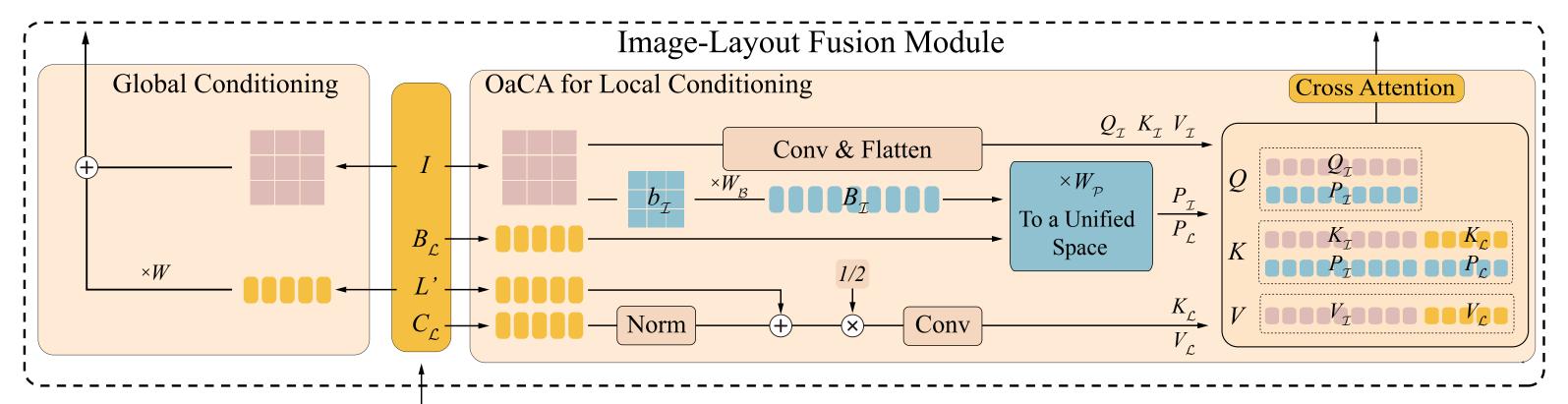


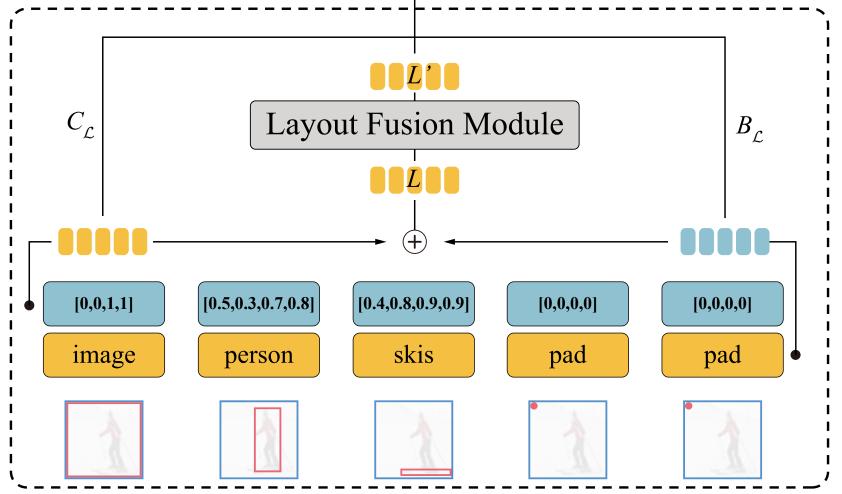


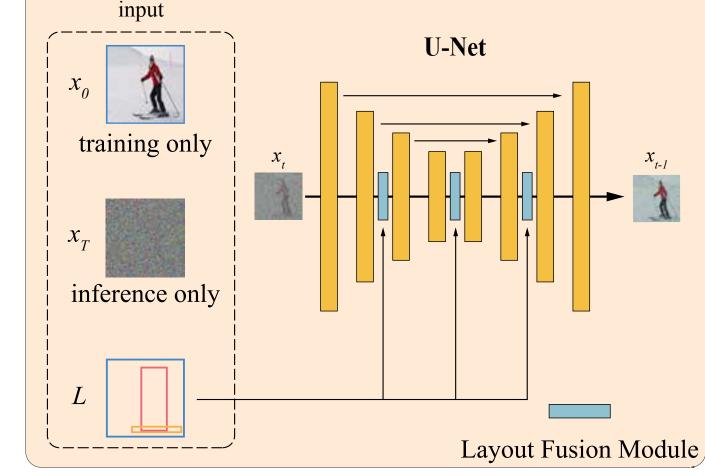
Results

Methods	COCO-stuff					\mathbf{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	_	_

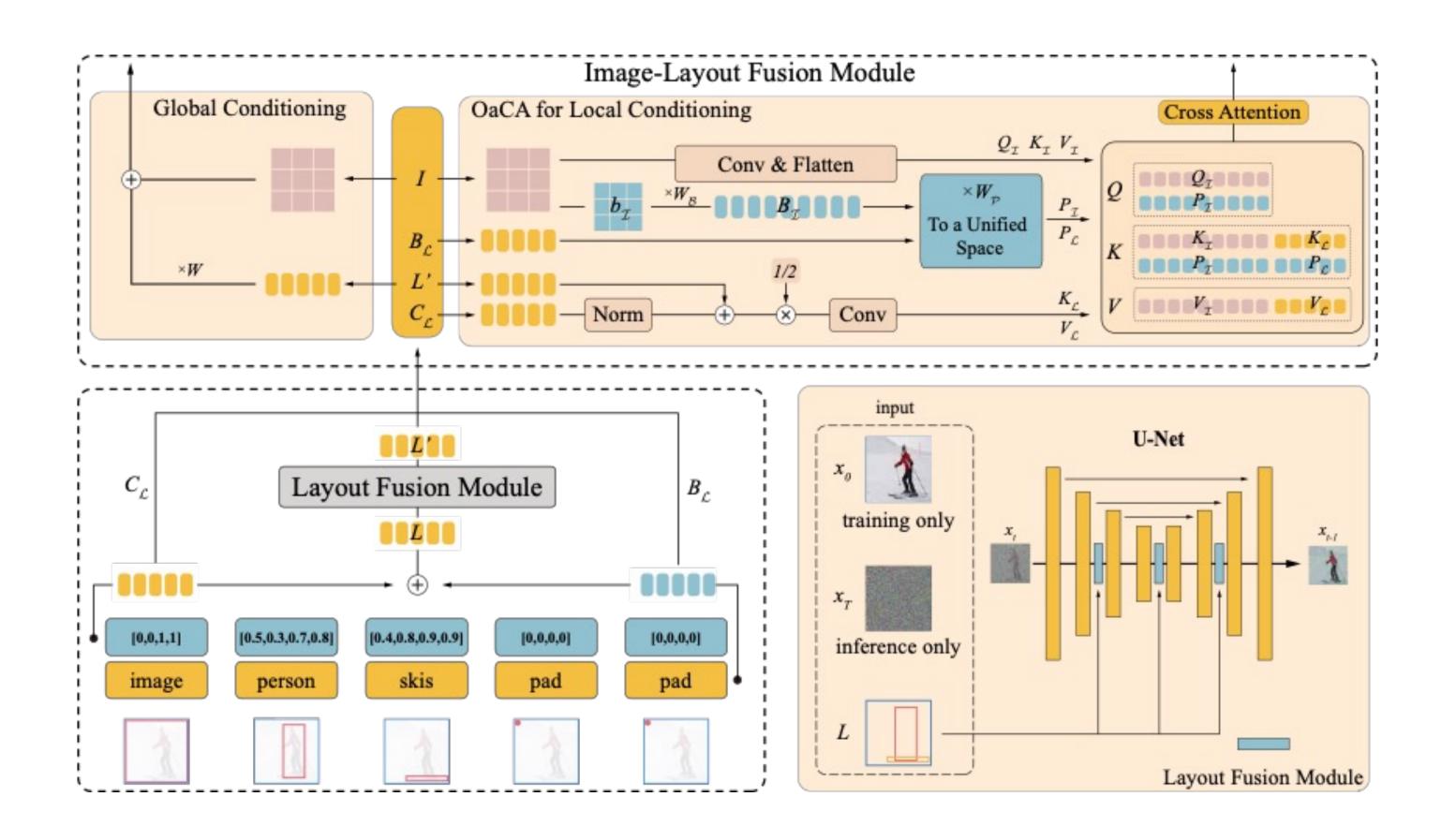




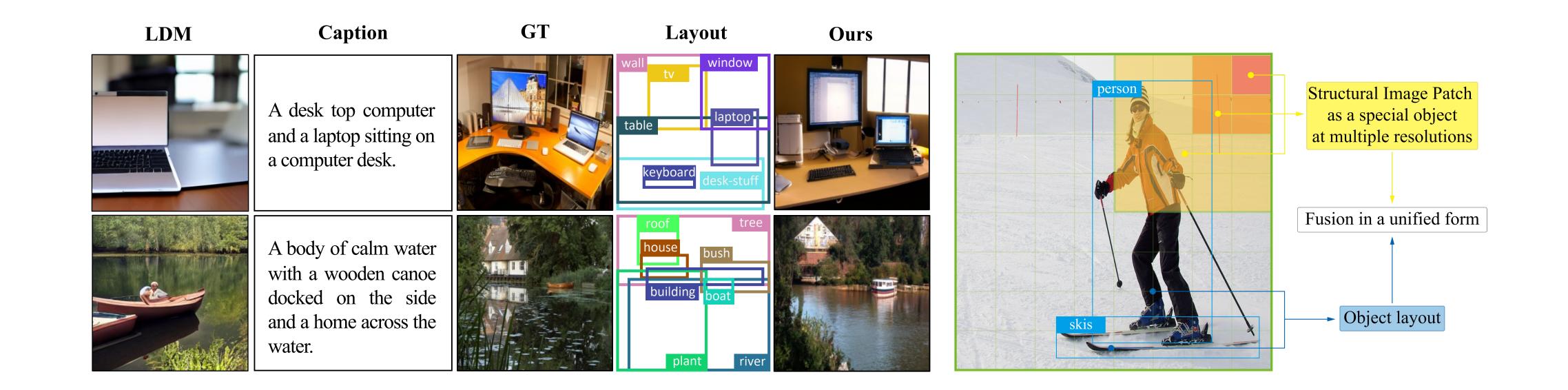


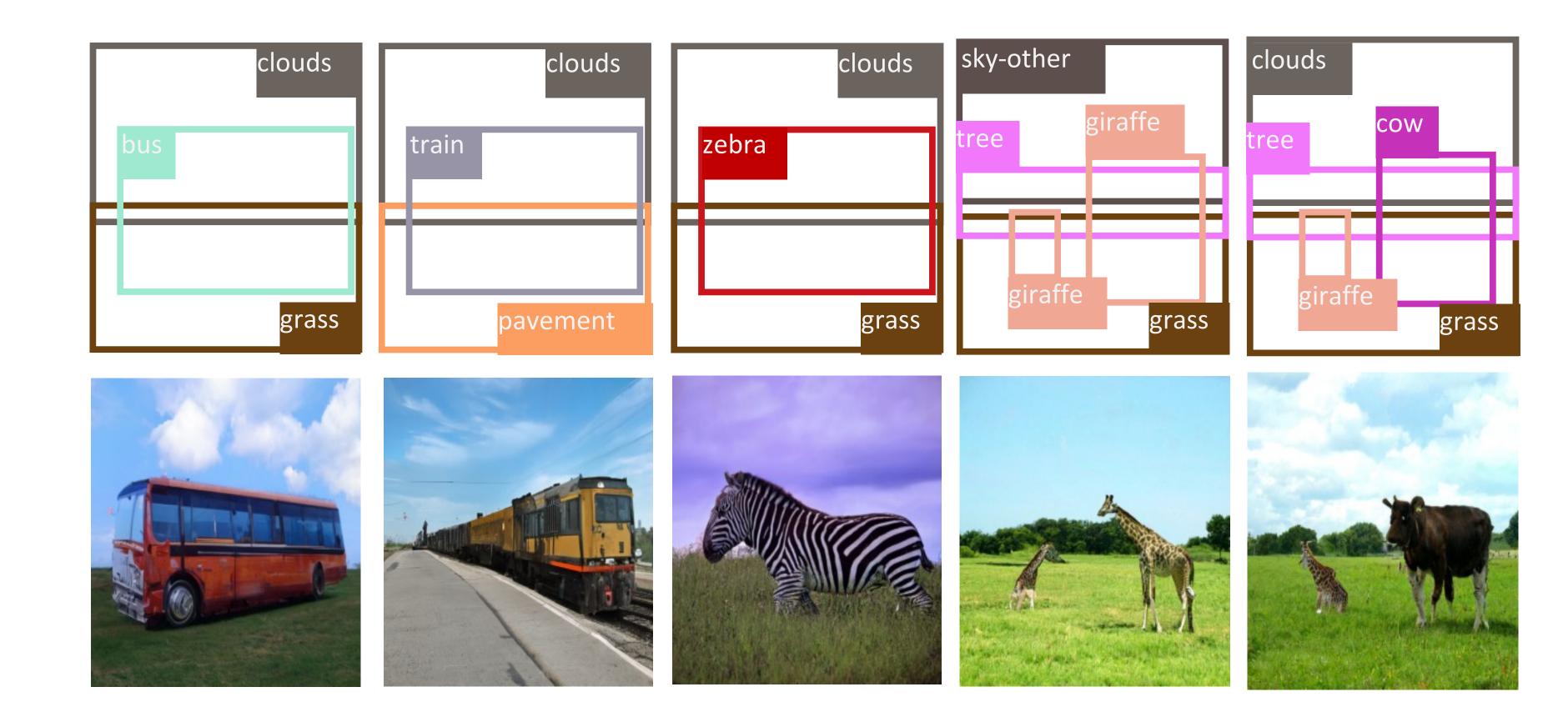




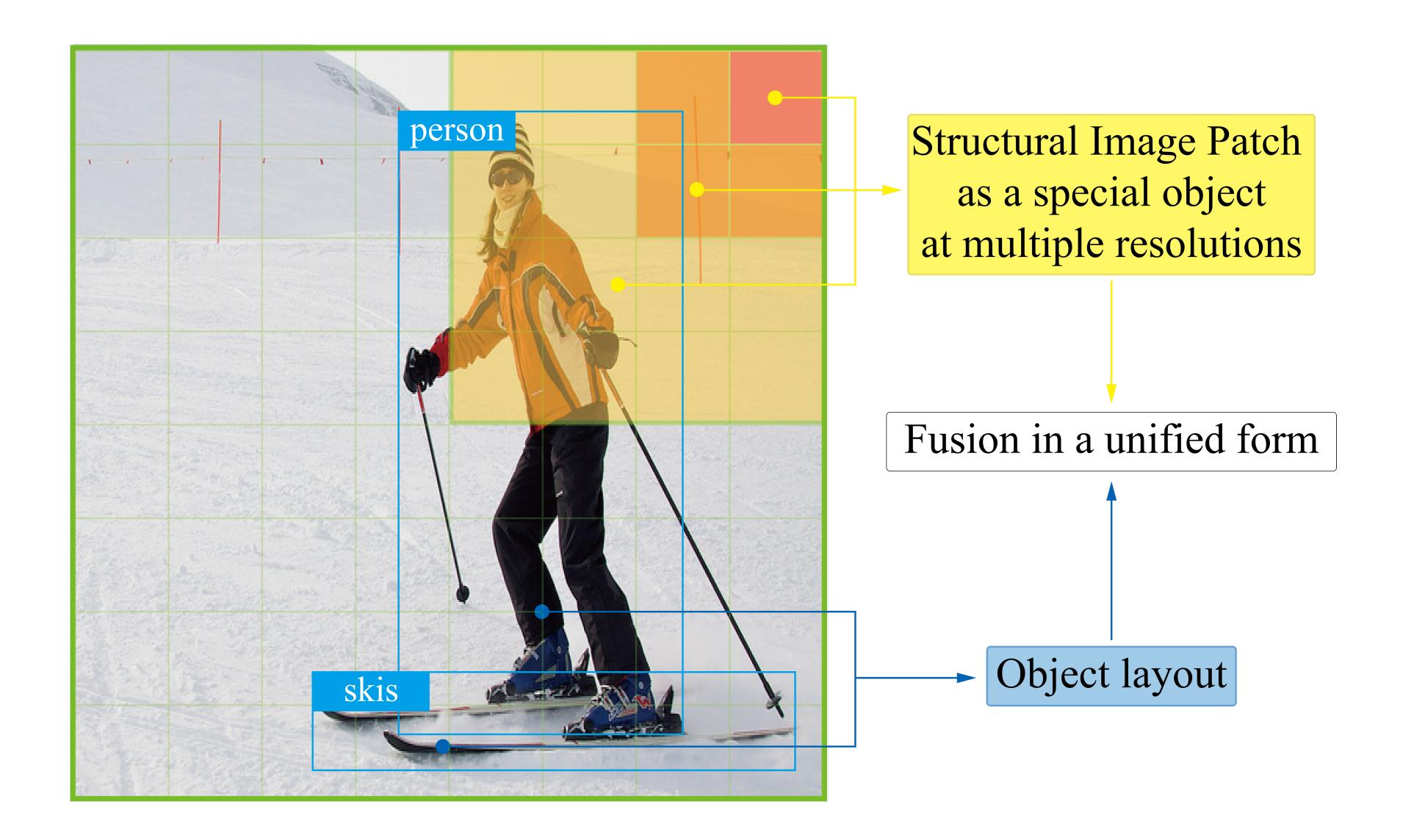














LDM	Caption	GT	Layout	Ours
	A desk top computer and a laptop sitting on a computer desk.		table laptop keyboard desk-shiff	
	A body of calm water with a wooden canoe docked on the side and a home across the water.		hous bus bus building boat	





