Inharmonious Region Localization

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Background

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Methods

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Experiments

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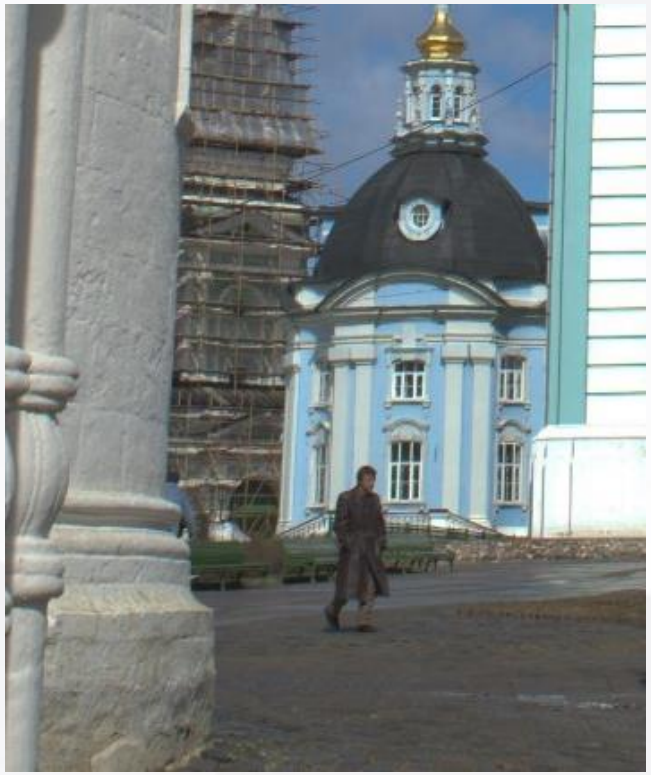
Discussion

1. Background—What is inharmonious region?

A

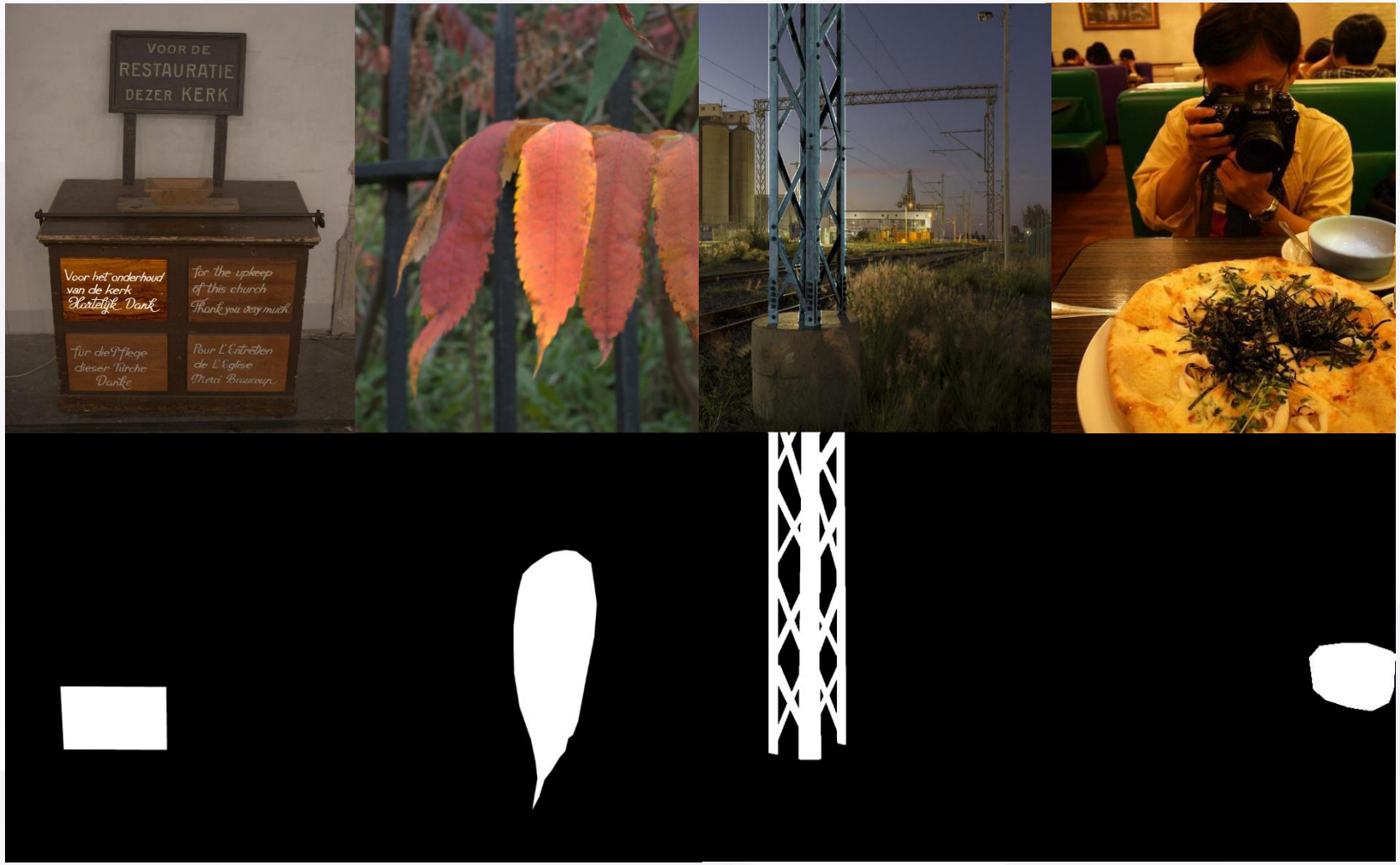


B

1. Background—What is inharmonious region?

Image

Ground Truth



(a) (b) (c) (d)

Color inconsistency **Lighting inconsistency**

1. Background—Definition & Challenges

1) Definition

The task of inharmonious region localization is aim to localize the inharmonious region in a synthetic image.

2) Challenges

- An area should be compared with multi-scale nearby regions to determine whether it is an inharmonious region.
- Inharmonious factors like color, lighting inconsistency are hard to capture.

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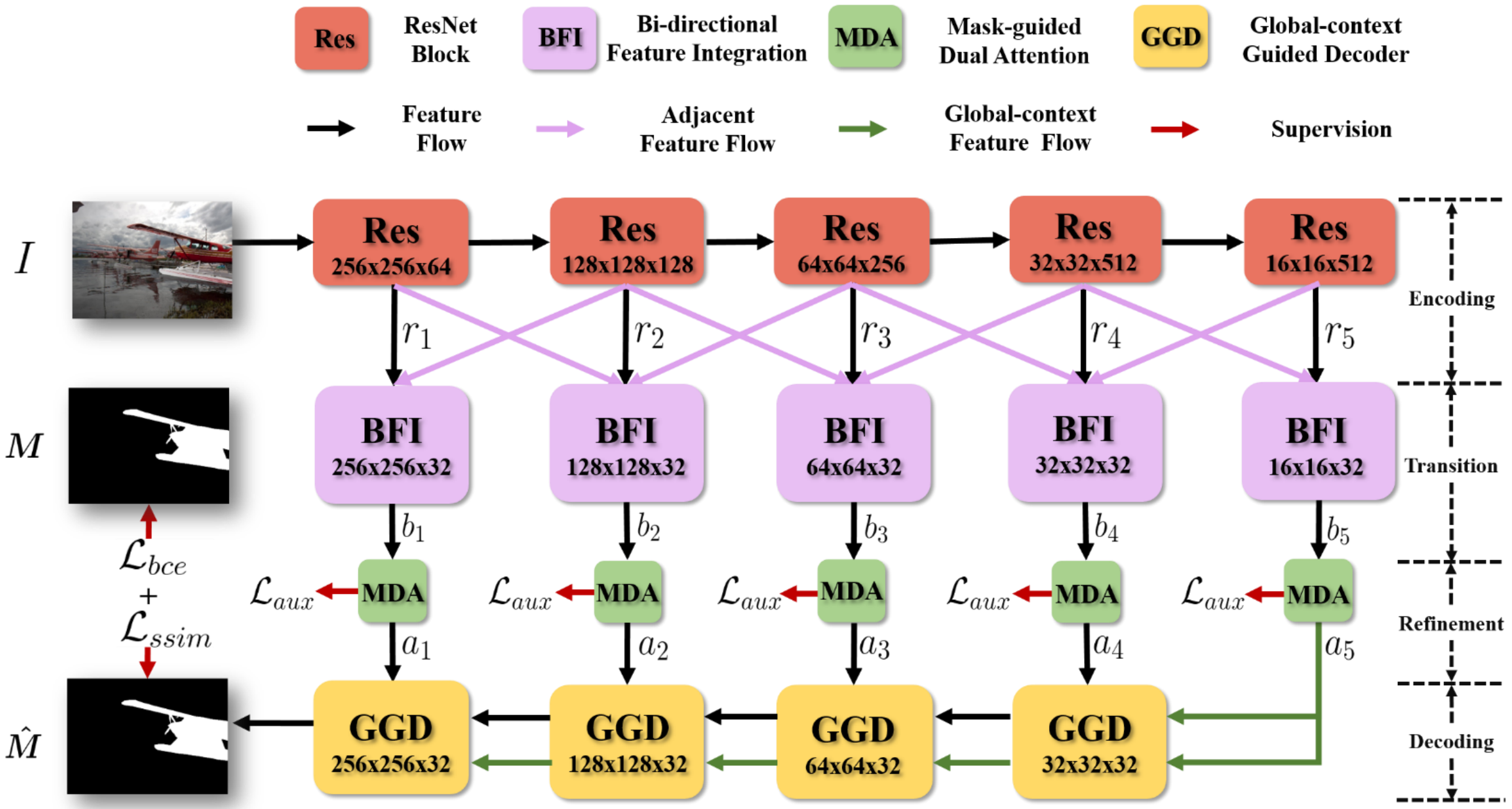
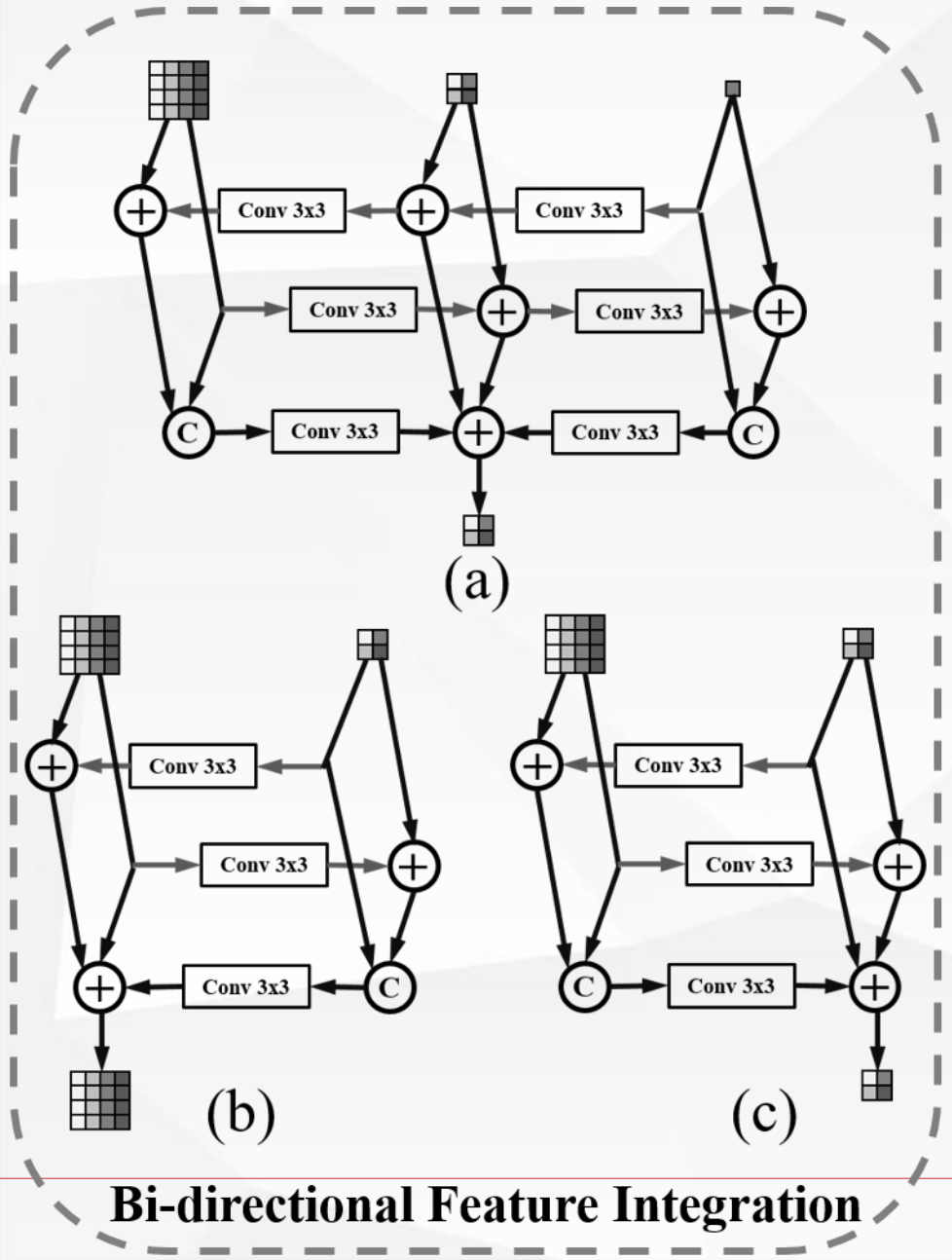
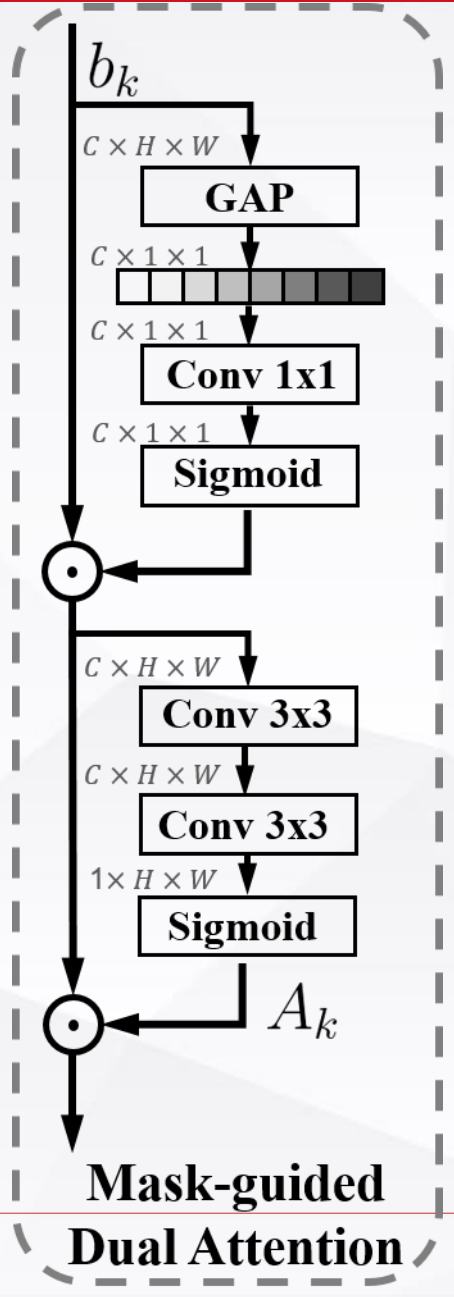
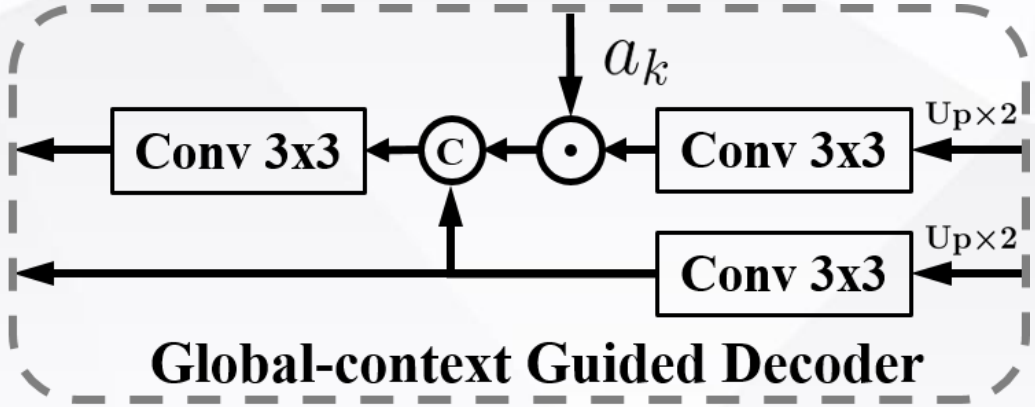
2. Methods—DIRL

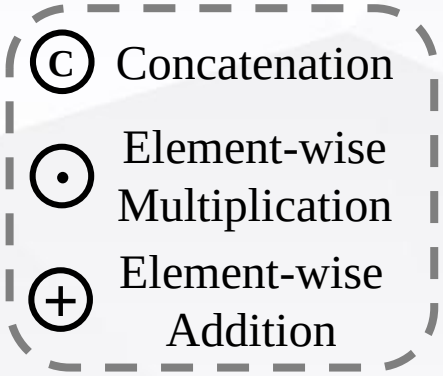


2. Methods—DIRL









2. Methods—DIRL

Loss functions:

$$\mathcal{L}_{bce} = -\sum_{i,j} M_{i,j} \log(\hat{M}_{i,j}) - \sum_{i,j} (1 - M_{i,j}) \log(1 - \hat{M}_{i,j})$$

$$\mathcal{L}_{ssim} = 1 - \frac{(2\mu_x\mu_y + C_1)(2\sigma_{xy} + C_2)}{(\mu_x^2 + \mu_y^2 + C_1)(\sigma_x^2 + \sigma_y^2 + C_2)}$$

$$\mathcal{L}_{aux} = -\sum_{k}\sum_{i,j} M_{i,j} \log(A_{k,i,j}) - \sum_{k}\sum_{i,j} (1 - M_{i,j}) \log(1 - A_{k,i,j})$$

$$\mathcal{L}_{total} = \mathcal{L}_{bce} + \mathcal{L}_{ssim} + \lambda \mathcal{L}_{aux}$$

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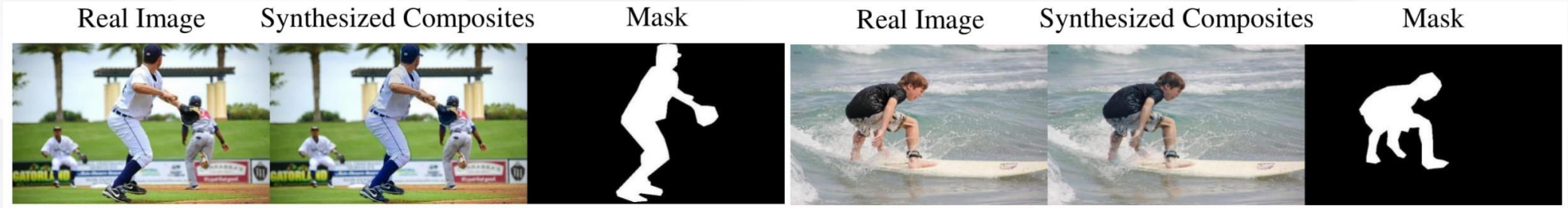
3. Experiments

We conduct all experiments on the iHarmoney4 dataset.



(a) Examples of HCOCO.

(b) Examples of HAdobe5k.

(c) Examples of HFlickr.

(d) Examples of Hday2night.

3. Experiments—Quantitative Comparisons

	Method	AP(%) ↑	F_1 ↑	IoU(%) ↑
Segmentation	UNet [25]	74.90	0.6717	64.74
	DeepLabv3 [29]	75.69	0.6902	66.01
	HRNet [30]	75.33	0.6765	65.49
Image Manipulation Localization	MFCN [19]	45.63	0.3794	28.54
	MantraNet [15]	64.22	0.5691	50.31
	MAGritte [20]	71.16	0.6907	60.14
	H-LSTM [16]	60.21	0.5239	47.07
Image Harmonization	S2AM [2]	43.77	0.3029	22.36
	DIRL	**80.02**	**0.7317**	**67.85**

3. Experiments—Qualitative Comparisons

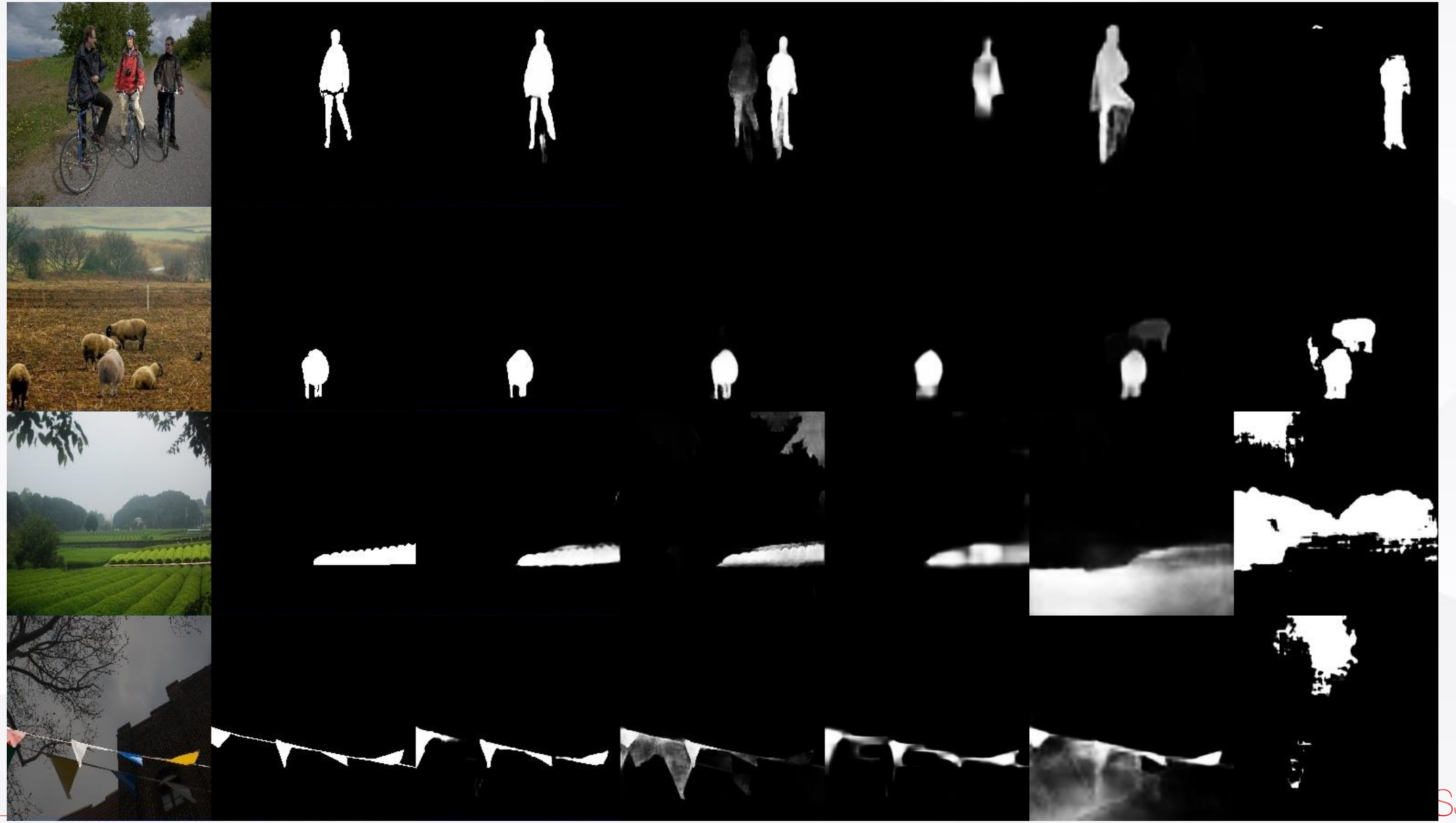
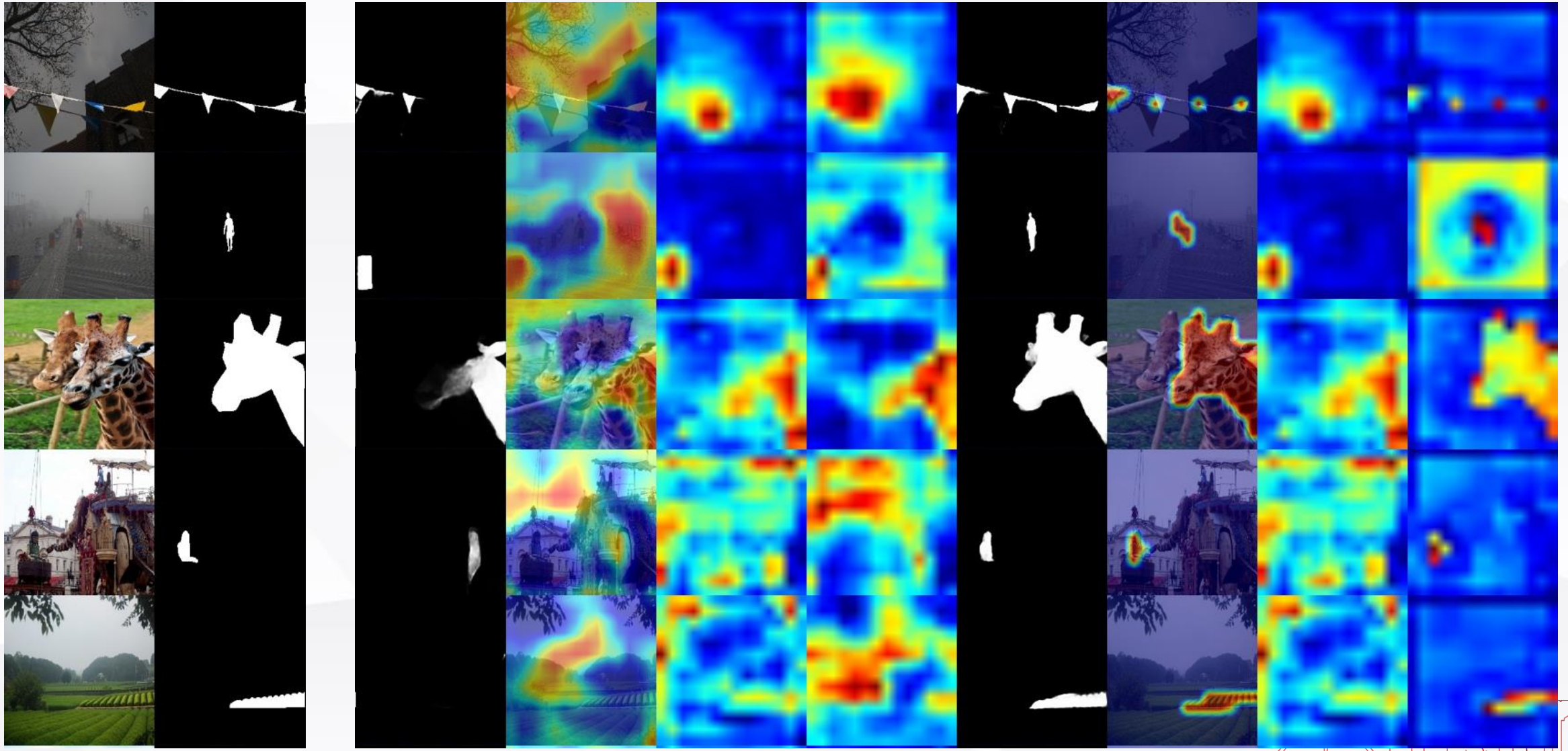


Image GT Ours DeepLabv3 HRNet UNet MAGritte

3. Experiments—MDA Visualization



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Thank You!

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