

# Semantic-Guided Inpainting Network for Complex Urban Scenes Manipulation

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# Image Manipulation

*The art of transforming an image to convey what **you** want*

- Object Insertion



- Object removal or image inpainting



# Challenges

- Mixed scenes contains objects and background of different classes



# Challenges

- Missing part with different semantics



[12] Guilin Liu, Fitsum A Reda, Kevin J Shih, Ting-Chun Wang, Andrew Tao, and Bryan Catanzaro. Image inpainting for irregular holes using partial convolutions. In Proceedings of the European Conference on Computer Vision (ECCV), pages 85–100, 2018

# SGI-Net: Use Cases

## Image manipulation in complex urban scenarios

- Object insertion
- Image reconstruction

1. Remove objects via input shape



3. Insert objects via random sampling



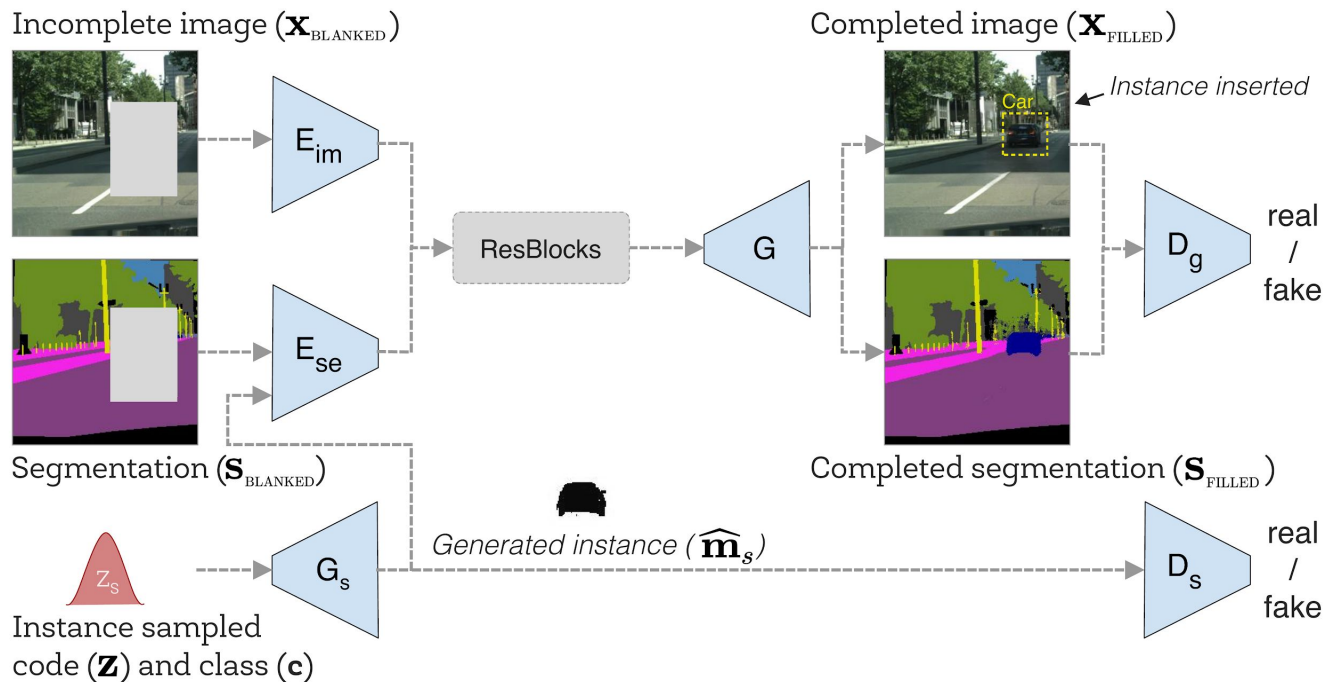
2. Remove objects / area inpainting



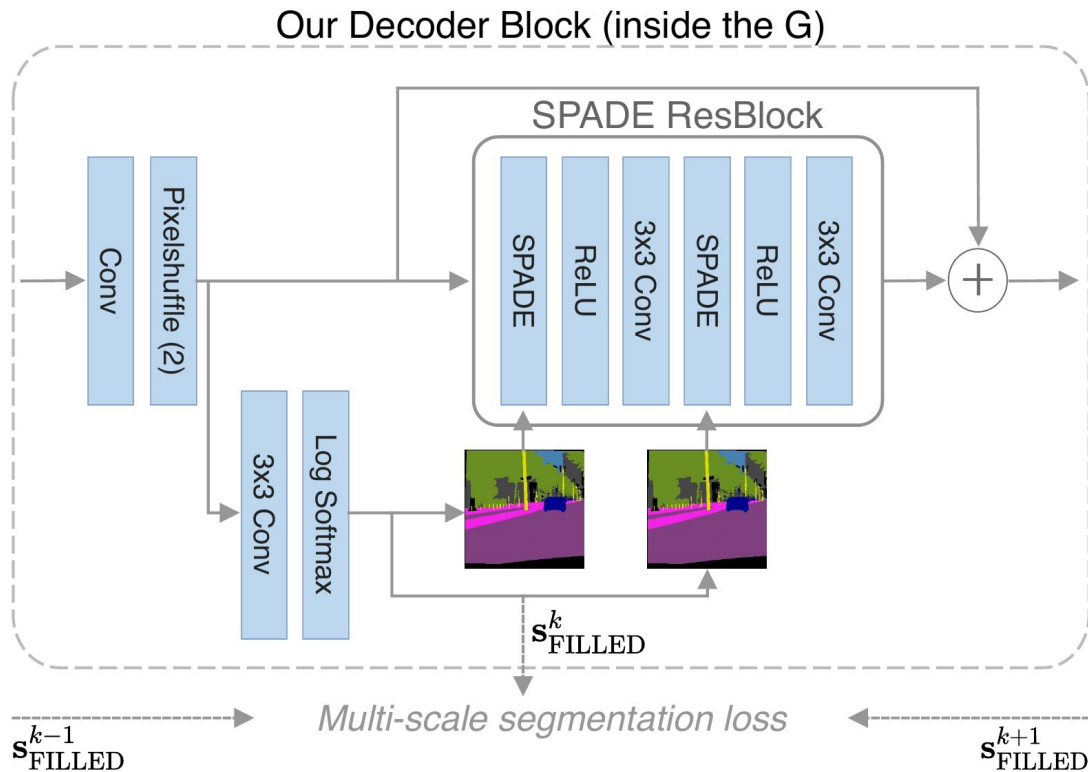
4. Insert objects via input shape



# SGI-Net: Architecture



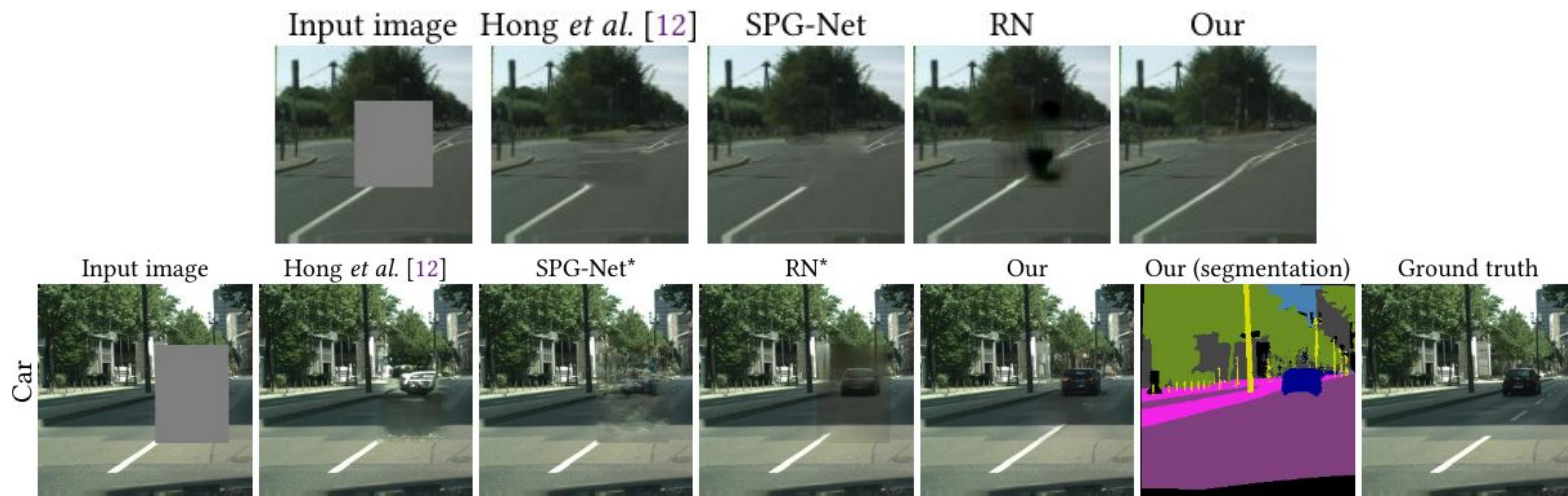
# SGI-Net: Decoder Block





# Results

Model	Experimental setting	Cityscapes			Indian Vista		
		PSNR↑	FID↓	F1↑	PSNR↑	FID↓	F1↑
Hong <i>et al.</i> [12]	Restore	31.07	7.26	0.00	30.31	6.34	0.00
SPG-Net [41]		31.36	7.97	0.00	29.95	6.39	0.02
RN [50]		32.16	9.64	0.00	29.83	11.14	0.02
Our proposal		<b>32.95</b>	<b>5.08</b>	<b>0.06</b>	<b>30.97</b>	<b>5.45</b>	<b>0.05</b>
Hong <i>et al.</i> [12]	Place	31.08	7.26	0.10	30.32	6.32	0.91
SPG-Net*		31.37	7.96	0.10	29.94	6.38	0.87
RN*		31.74	9.79	0.54	29.62	10.76	0.71
Our proposal		<b>32.96</b>	<b>5.05</b>	<b>0.91</b>	<b>30.98</b>	<b>5.43</b>	<b>0.97</b>





# Thank You

Github: <https://github.com/PierfrancescoArdino/SGINet>