

ARShadowGAN: Shadow Generative Adversarial Network for Augmented Reality in Single Light Scenes

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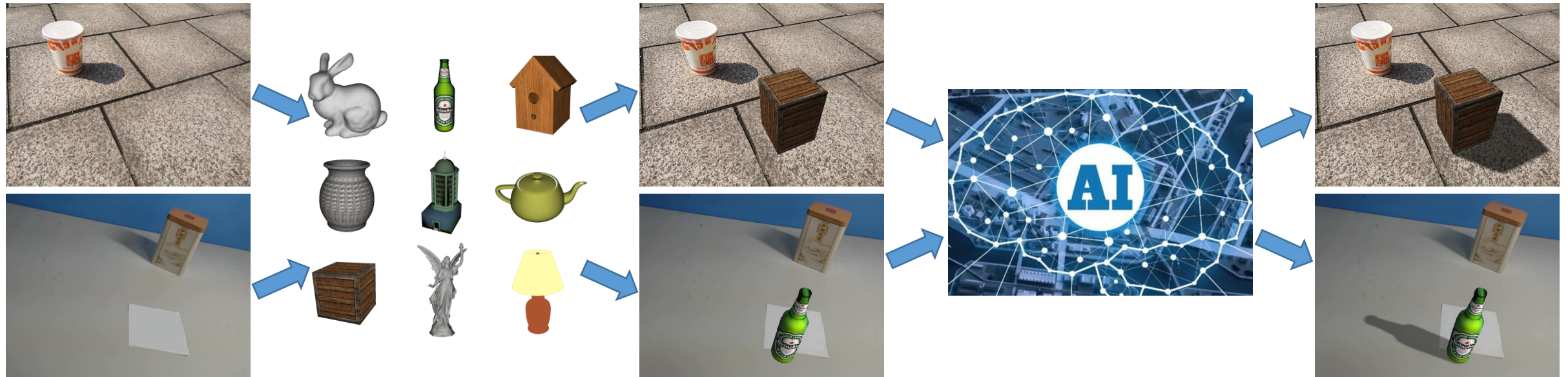


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**This work was co-supervised by Chengjiang Long and Chunxia Xiao.*

How to Automatically Generate Virtual Shadows for AR?



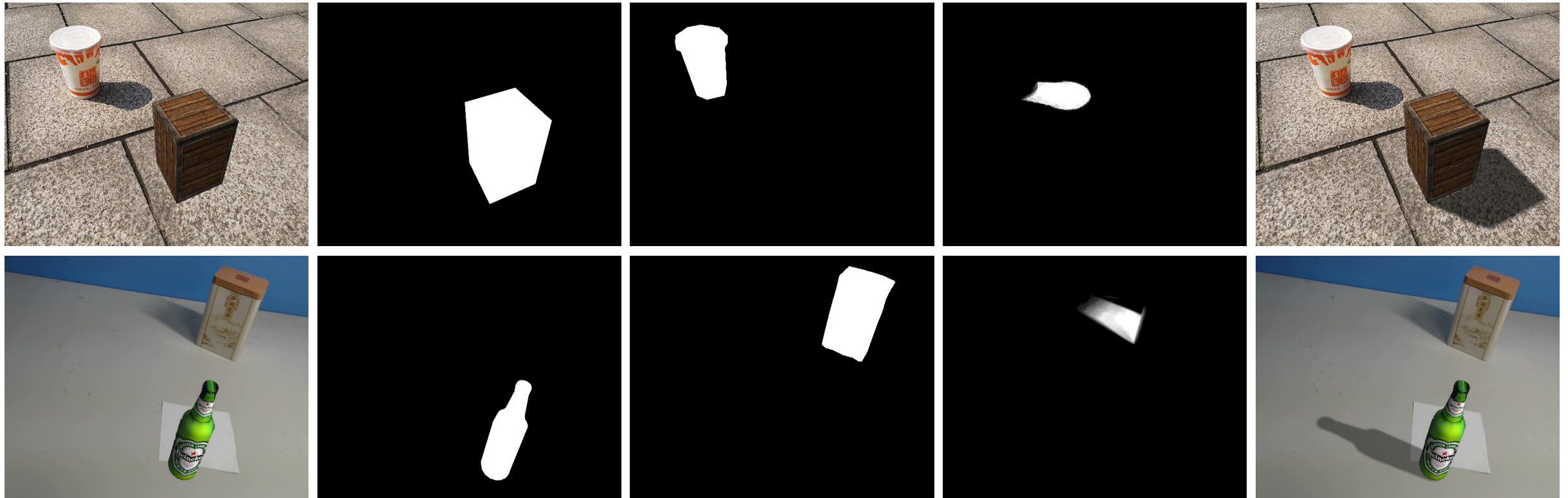
With the physically based rendering theory:

- It requires an inverse rendering process which is very expensive and challenging in practice.
- What's worse, any inaccurate estimation may result in unreasonable virtual shadows.

We propose a data-driven based ARShadowGAN to directly generate virtual shadows without inverse rendering. With the powerful generation ability of GAN, it is much more efficient and easier to use.

Shadow-AR Dataset

- Shadow-AR dataset contains total 3,000 image quintuples



Input Image

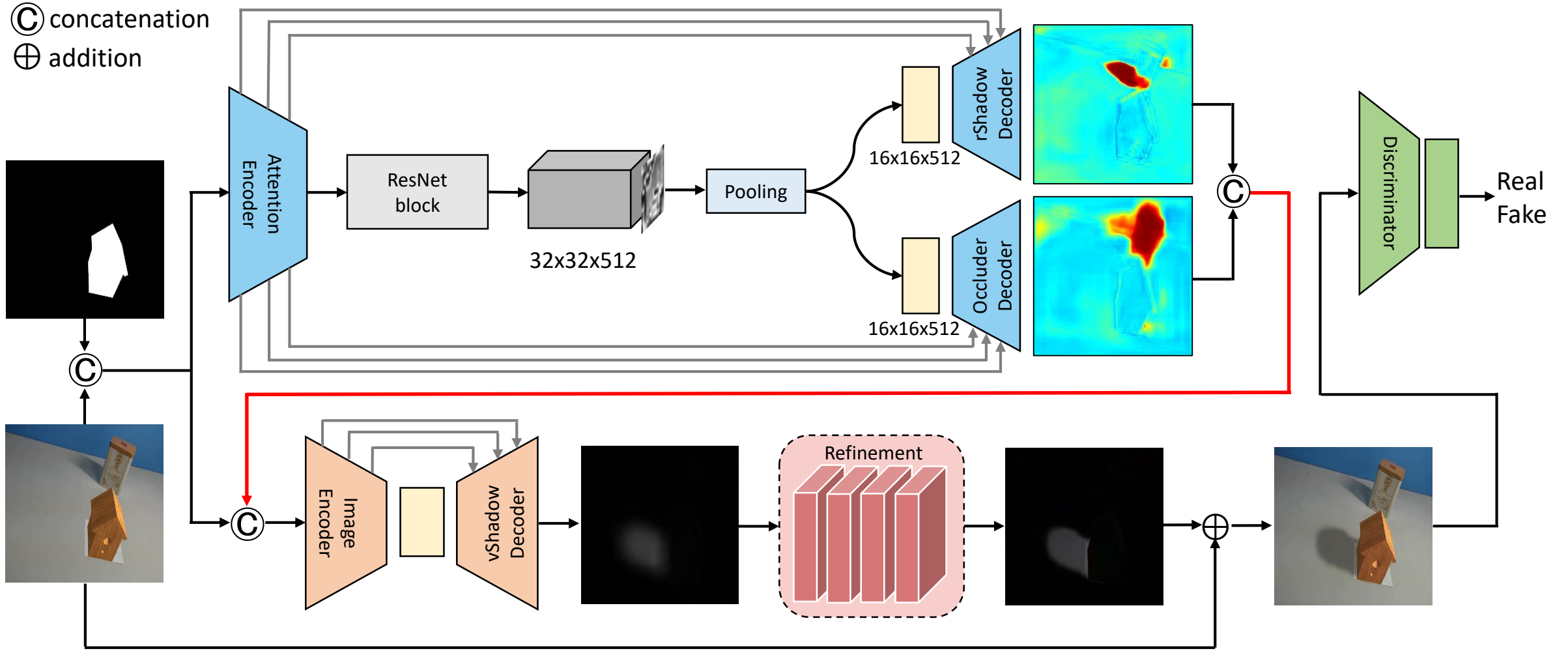
Input Mask

Mask-Real Object

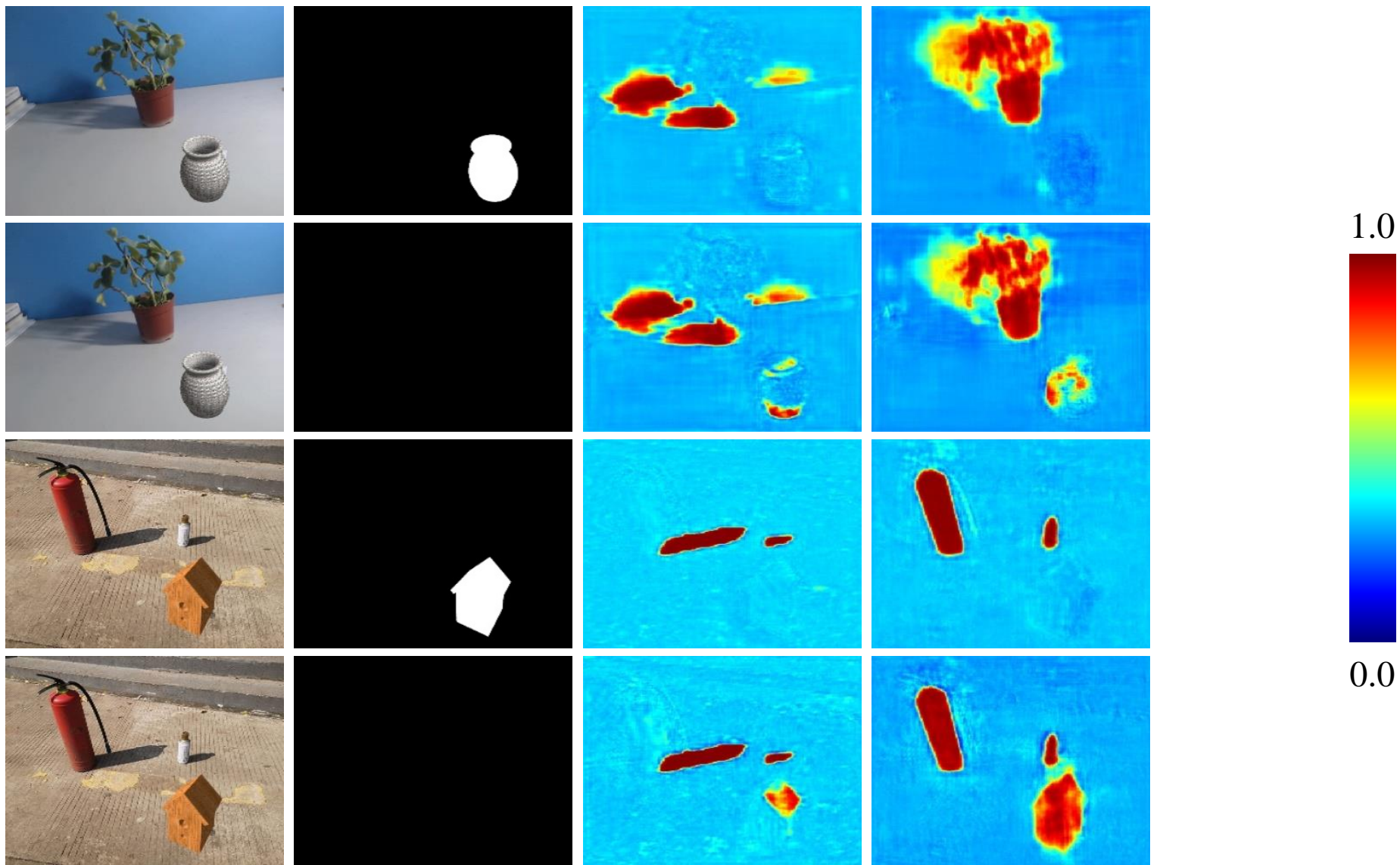
Mask-Real Shadow

Target Image

ARShadowGAN



Attention Visualization



Input Image

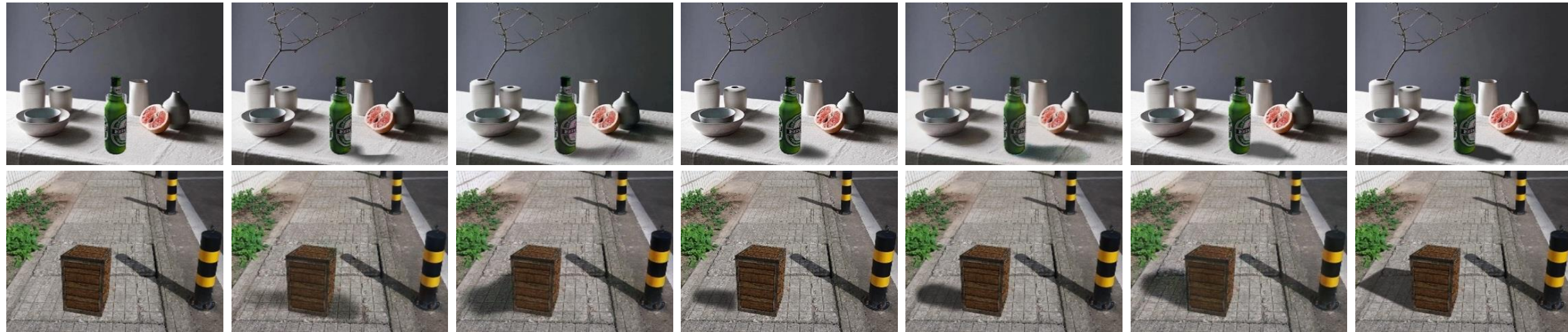
Input Mask

Attn-Real Shadow

Attn-Real Object

Experimental Results

Models	RMSE	SSIM	S (%)	A (%)	ACC (%)
Pix2Pix	9.514	0.938	41.468	27.358	90.631
Pix2Pix-Res	8.043	0.959	29.597	26.476	96.689
ShadowGAN	8.041	0.961	28.347	24.547	97.122
Mask-ShadowGAN	7.493	0.959	23.261	21.131	98.443
ARShadowGAN	6.520	0.965	22.278	19.267	98.453



Input Image

Pix2Pix

Pix2Pix-Res

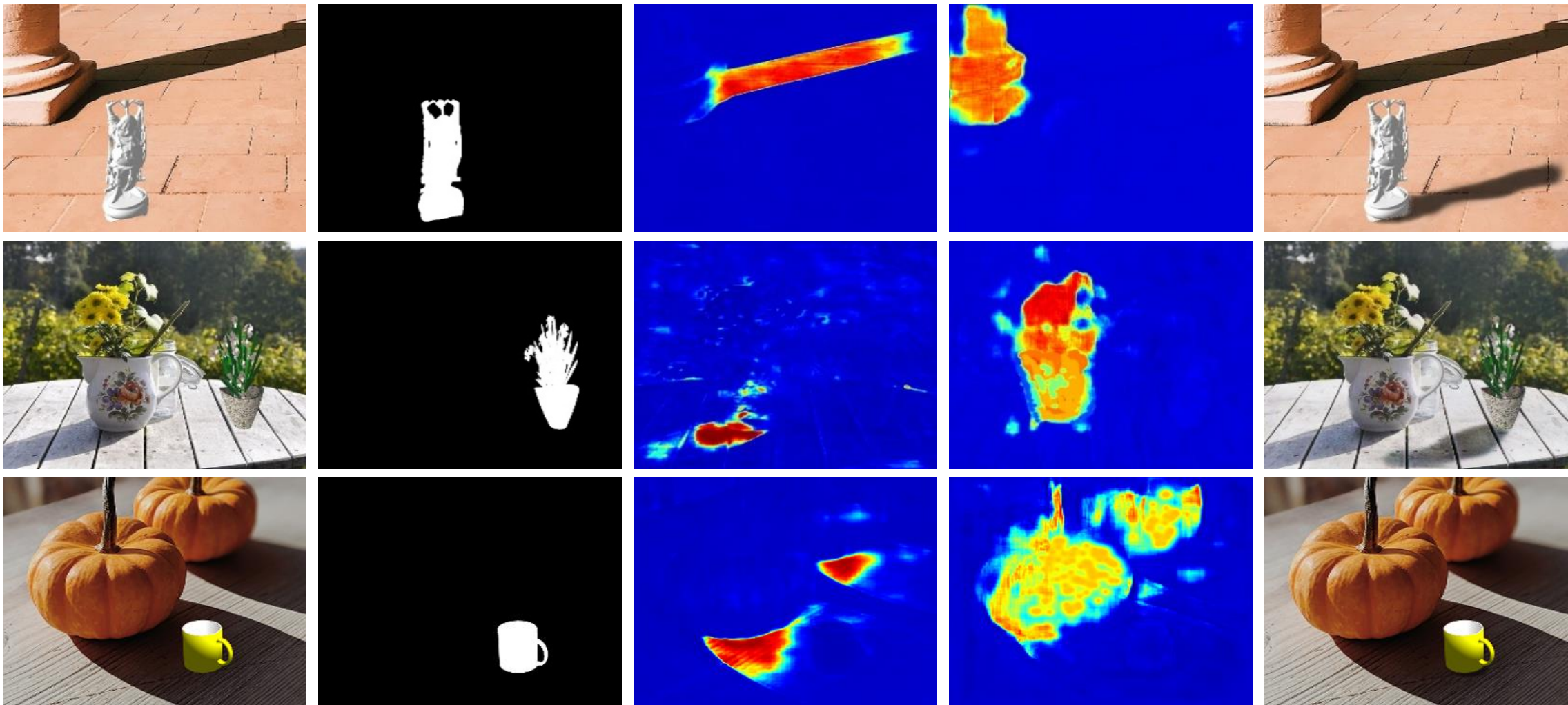
ShadowGAN

Mask-ShadowGAN

ARShadowGAN

GT

Shadow Generation



Input Image

Input Mask

Attn-Real Shadow

Attn-Real Object

Output Image

Paper QR Code:

http://www.chengjianglong.com/publications/ARShadowGAN_CVPR.pdf



Thank you!

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