



DoveNet: Deep Image Harmonization via Domain Verification

Wenyan Cong, Jianfu Zhang, Li Niu, Liu Liu, Zhixin Ling, Weiyuan Li and Liqing Zhang

MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University East China Normal University



Motivations

- Given a composite image, mage harmonization aims to making the pasted foreground compatible with the background.
- The lack of high-quality publicly available dataset for image harmonization hinders the development of image harmonization techniques.
- There are still limited deep-learning based research in image harmonization field.



Unrealistic composite image

Realistic harmonized result

Dataset iHarmony4 Construction

- Based on COCO, Adobe5k, Flickr and day2night dataset, we constructed HCOCO, HAdobe5k, HFlickr and Hday2night sub-dataset.
- After foreground segmentation, the foreground appearance is adjusted either by exchanging to another style or by color mapping from reference object to target object.
- Automatic filtering and manual filtering are applied to improve the quality.



iHarmony4 Dataset

- It's the first publicly available large-scale image harmonization dataset.
- Guarantee both the high quality and large diversity of composite images.



DoveNet

- We leverage an attention enhanced generator and two complementary discriminators.
- Domain verification discriminator extracts the domain representations of foreground and background, and matches the foreground domain to background domain.



Visual Results



Ground truth

DIH

S²AM

DoveNet (w/o ver)

DoveNet





Thanks for watching!

DoveNet: Deep Image Harmonization via Domain Verification

Wenyan Cong, Jianfu Zhang, Li Niu, Liu Liu, Zhixin Ling, Weiyuan Li and Liqing Zhang

MoE Key Lab of Artificial Intelligence, Shanghai Jiao Tong University East China Normal University

Project GitHub page

More details