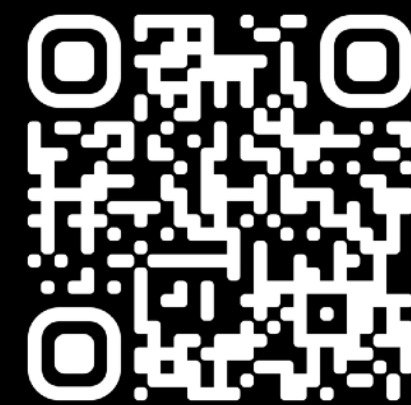


CVC UAB PromptNorm: Image Geometry Guides Ambient Light Normalization

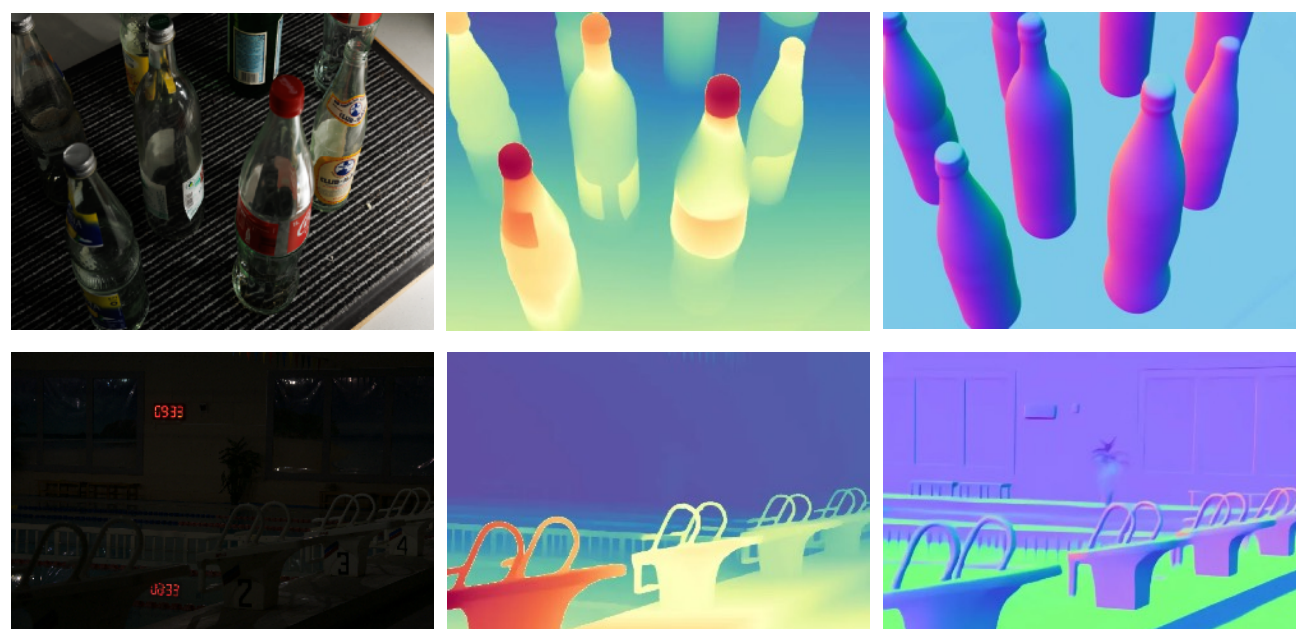


David Serrano-Lozano, Francisco A. Molina-Bakhos, Danna Xue, Yixiong Yang, Maria Pilligua, Ramon Baldrich, Maria Vanrell and Javier Vazquez-Corral



Motivation

Just like seeing in the dark, knowing the scene's geometric structure enhances image understanding and improves downstream tasks such as ambient lighting normalization.



*Results from Depth Anything V2 [1]

Ambient Lighting Normalization

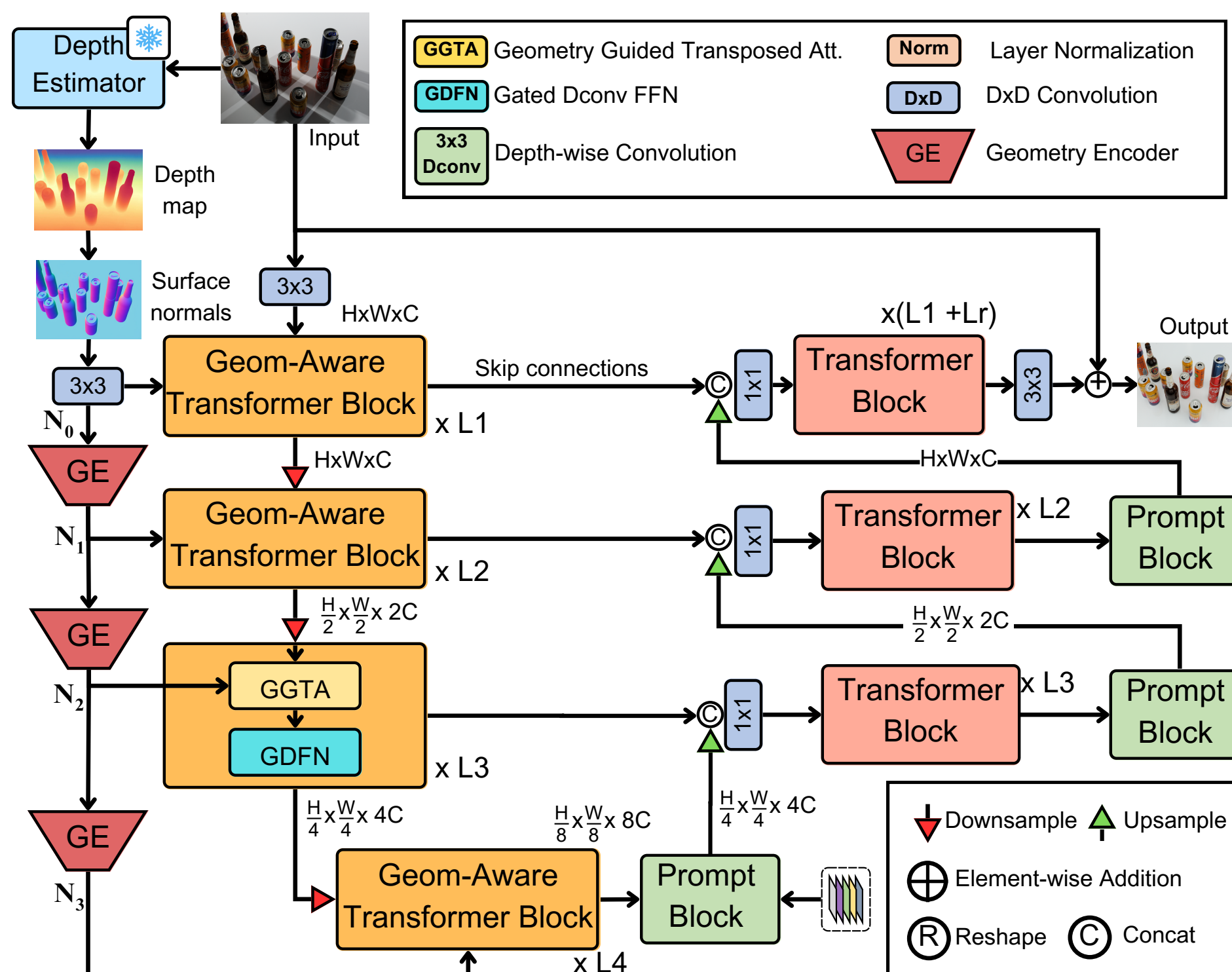
Eliminate shadows and standardize lighting across the scene.

Ambient6K [2] dataset:

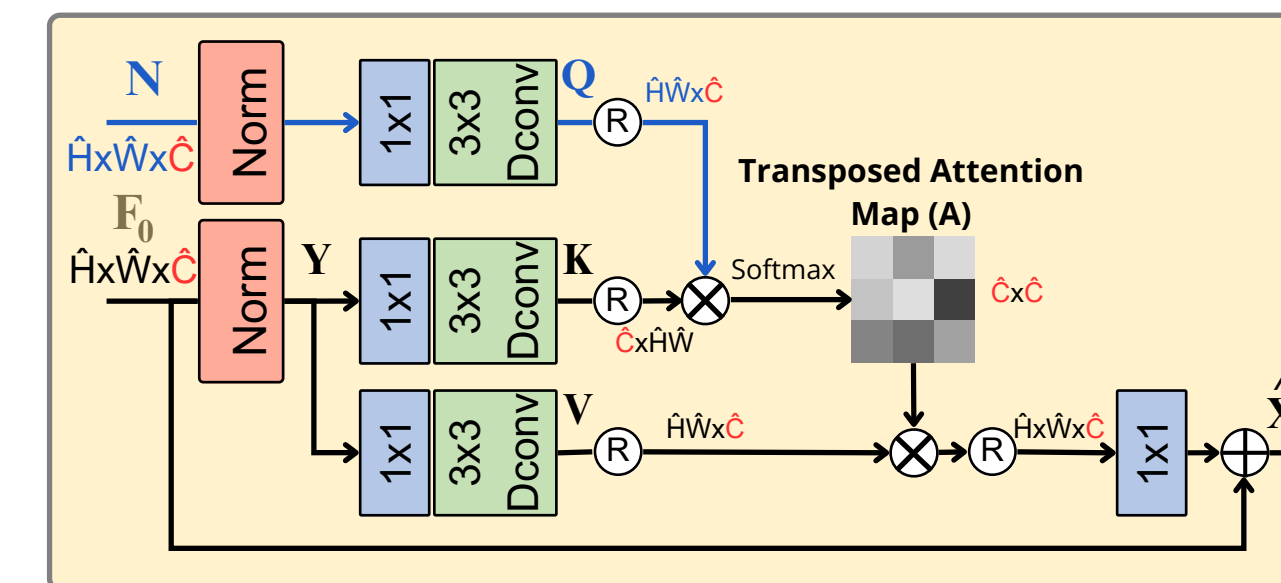


TL;DR: Injecting scene geometry into a transformer-based image restoration model to improve ambient lighting normalization.

PromptNorm



Geometry Guided Transposed Att.



Results on Ambient6K

Method	Task	Type	Prior	MACs (G.)	PSNR $\uparrow$	SSIM $\uparrow$	LPIPS $\downarrow$
Unprocessed	-	-	-	-	13.592	0.658	0.2256
DCShadowNet	Shadow Remov.	Conv	RGB	13.15	17.731	0.711	0.187
SpA-Former	Shadow Remov.	Transf.	RGB + Freq.	16.82	19.594	0.806	0.130
NAFNet	Restoration	Conv	RGB	15.92	20.580	0.808	0.142
DW-NET	Dehazing	Conv	RGB + Freq.	7.54	20.969	0.805	0.137
MPRNet	Restoration	Conv	RGB	37.21	20.947	0.820	0.129
SFNet	Restoration	Transf.	RGB + Freq.	31.27	20.519	0.812	0.141
SwinIR	Restoration	Transf.	RGB	37.81	20.528	0.817	0.131
Uformer	Restoration	Transf.	RGB	19.33	20.776	0.818	0.131
Restormer	Restoration	Transf.	RGB	35.31	21.141	0.817	0.132
PromptIR	Restoration	Transf.	RGB	35.63	21.320	0.818	0.130
HINet	Restoration	Conv.	RGB	42.68	20.856	0.821	0.129
IFBlend	Restoration	Conv.	RGB + Freq.	26.01	21.443	0.819	0.128
PromptNorm	Restoration	Transf.	RGB + Geom.	13.49*	22.116	0.822	0.124

