Do Image Editing Models Understand Lighting?

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NeurIPS 2026 ED Spotlight

MEET US AT OUR POSTER

Tue, Dec 8 at 10am

Hall 1-4, Paper ID 139308

Project Page

Do Image Editing Model Understand Lighting?

“Turn on the light bulb”



Nano Banana Pro

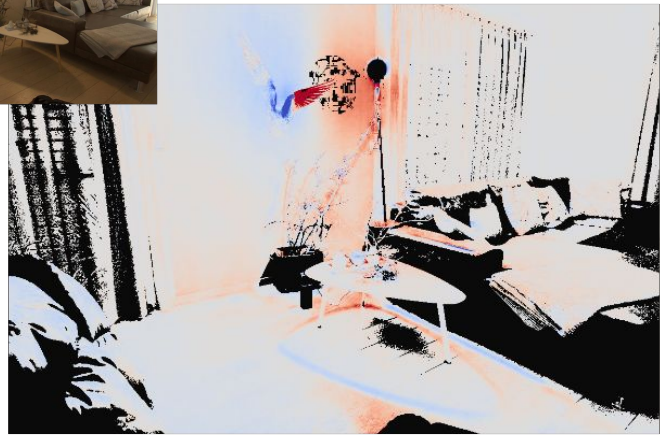


Flux 2 Dev

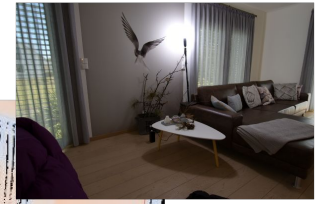
Do Image Editing Model Understand Lighting?



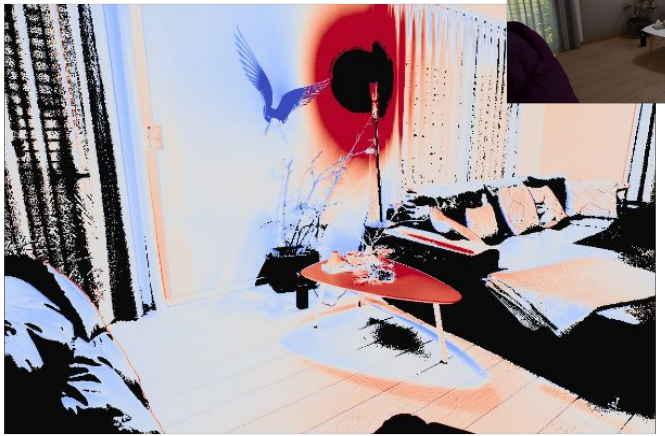
Yes!



Nano Banana Pro



No!



Flux 2 Dev

3D-anchored Light Probes Dataset (3DLP)

NEURAL INFORMATION PROCESSING SYSTEMS

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3DLP Dataset Creation

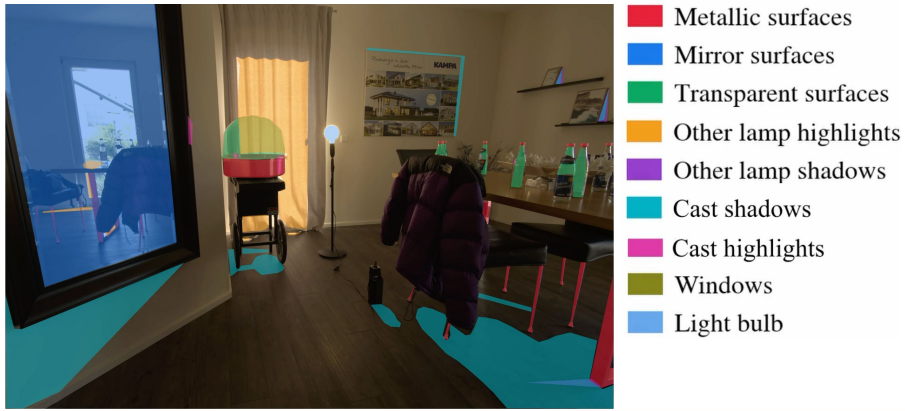
HDR Bracketing & Stacking



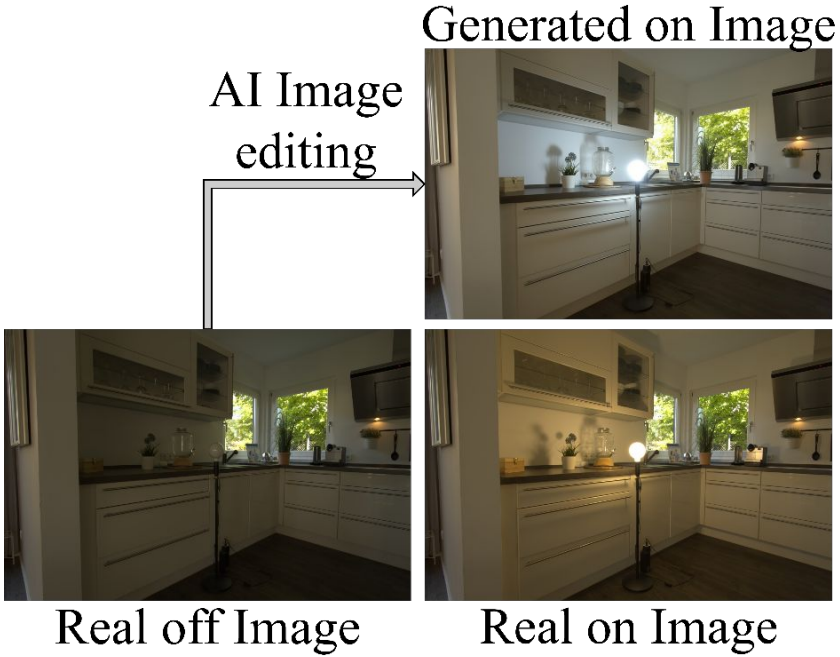
High-Fidelity HDR on & off pairs



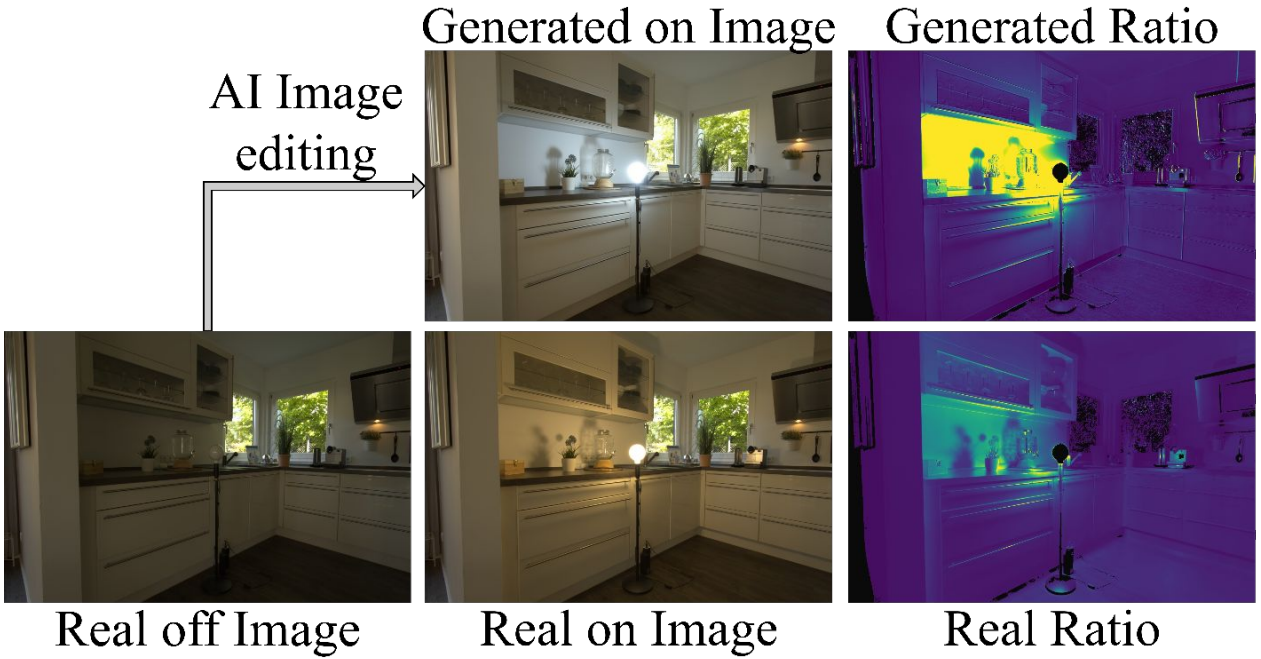
Labeling



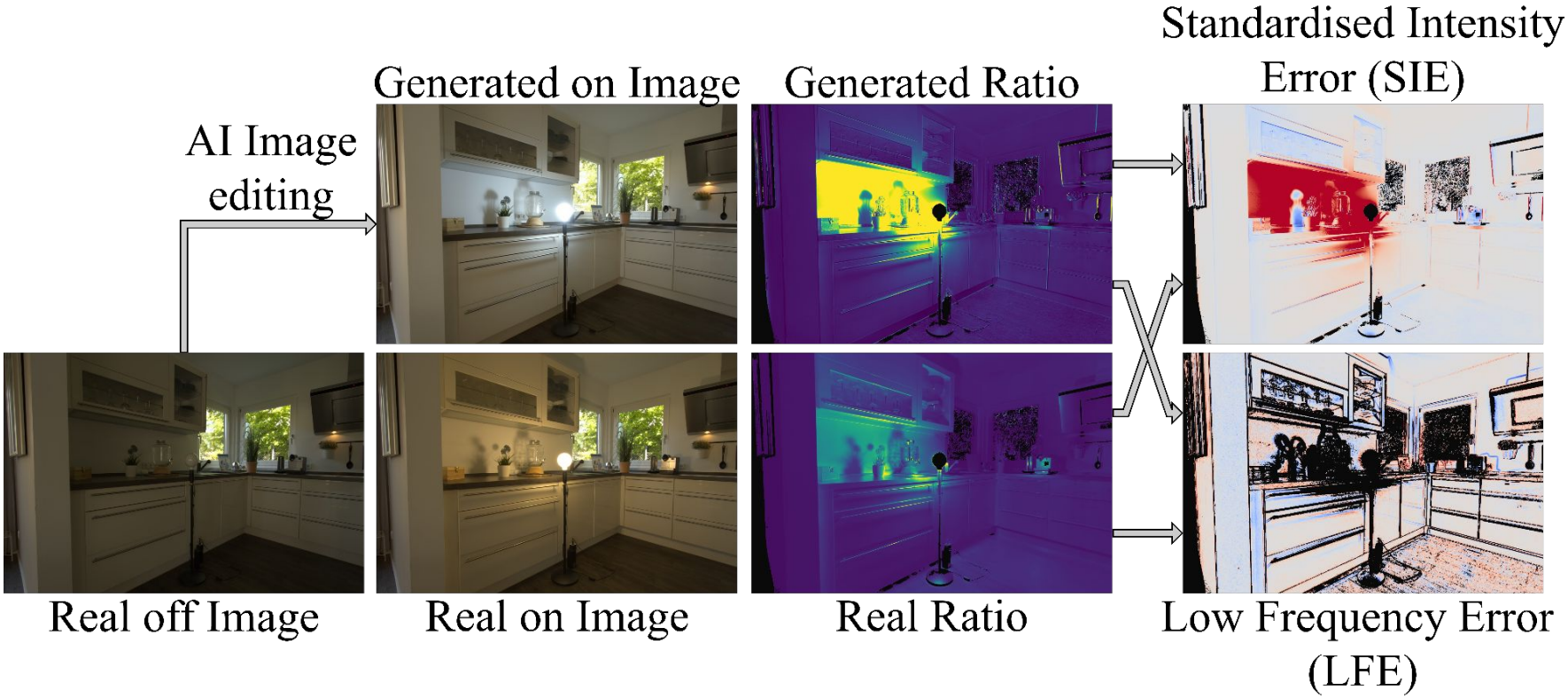
3DLP Benchmark Pipeline



3DLP Benchmark Pipeline



3DLP Benchmark Pipeline



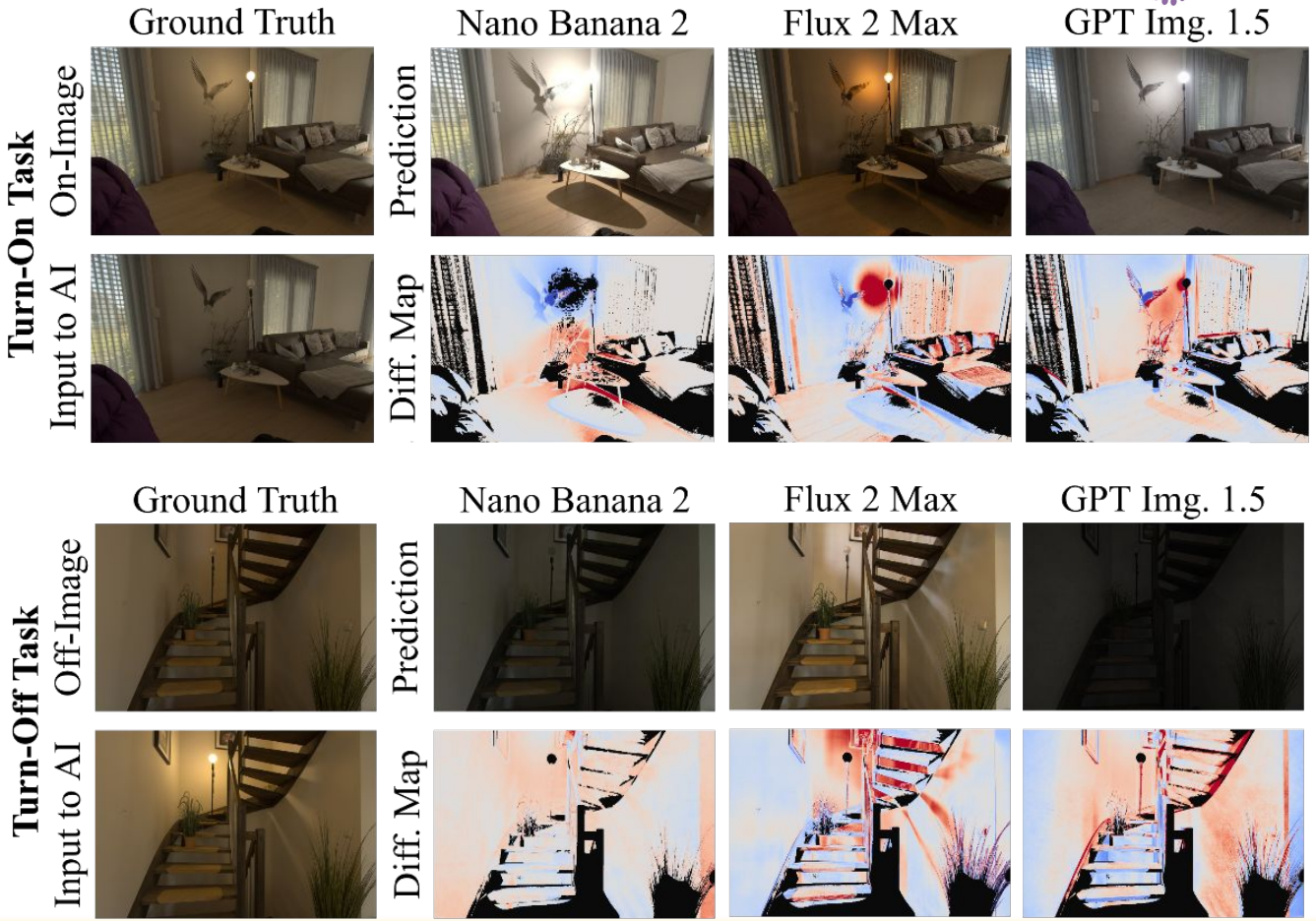
Check paper for metric derivations

3DLP Benchmark Results

Model	Turning Light On		Turning Light Off	
	SIE ↓	LFE ↓	SIE ↓	LFE ↓
Nano Banana Pro*	**0.813**	**1.641**	**0.769**	**1.651**
Nano Banana 2*	<u>0.882</u>	**1.641**	<u>0.871</u>	<u>1.652</u>
Qwen-Img.-Edit†	1.239	1.772	0.982	1.656
Flux 2 Max*	1.571	1.710	1.303	1.691
Flux 2 Dev†	1.747	1.775	2.136	1.797
GPT Img. 1.5*	2.336	1.933	1.887	1.734

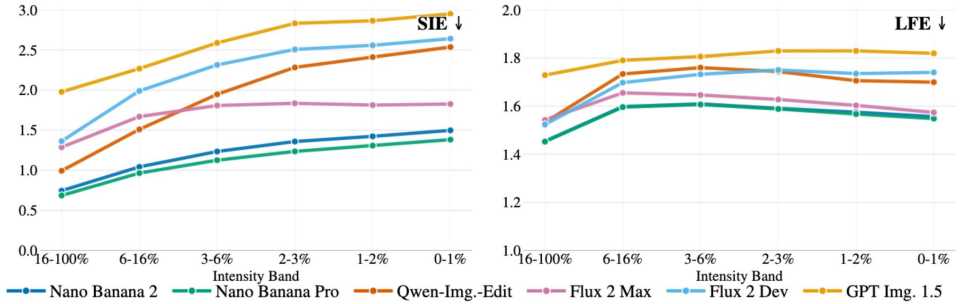
*Commercial model. †Open-source model.

3DLP Benchmark Results



Additional Results

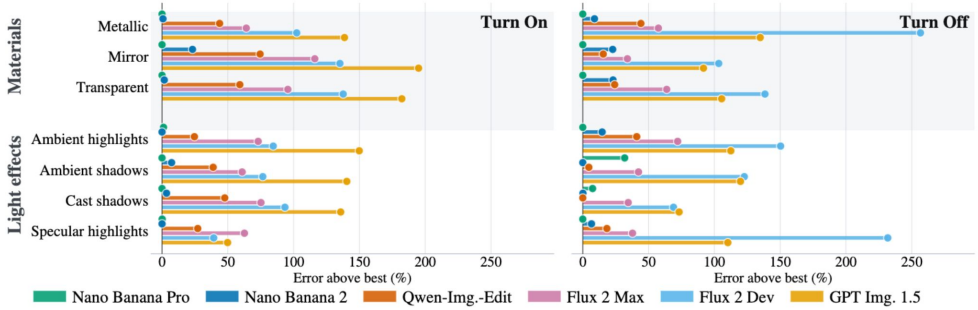
Models perform worse further away from the light source



+ Multiple lamps
+ Complex lamps
+ Colored lights
+ Outdoor images
+ Metric derivations
+ Metric user study

and much more

Models perform differently for various materials and light effects



Paper