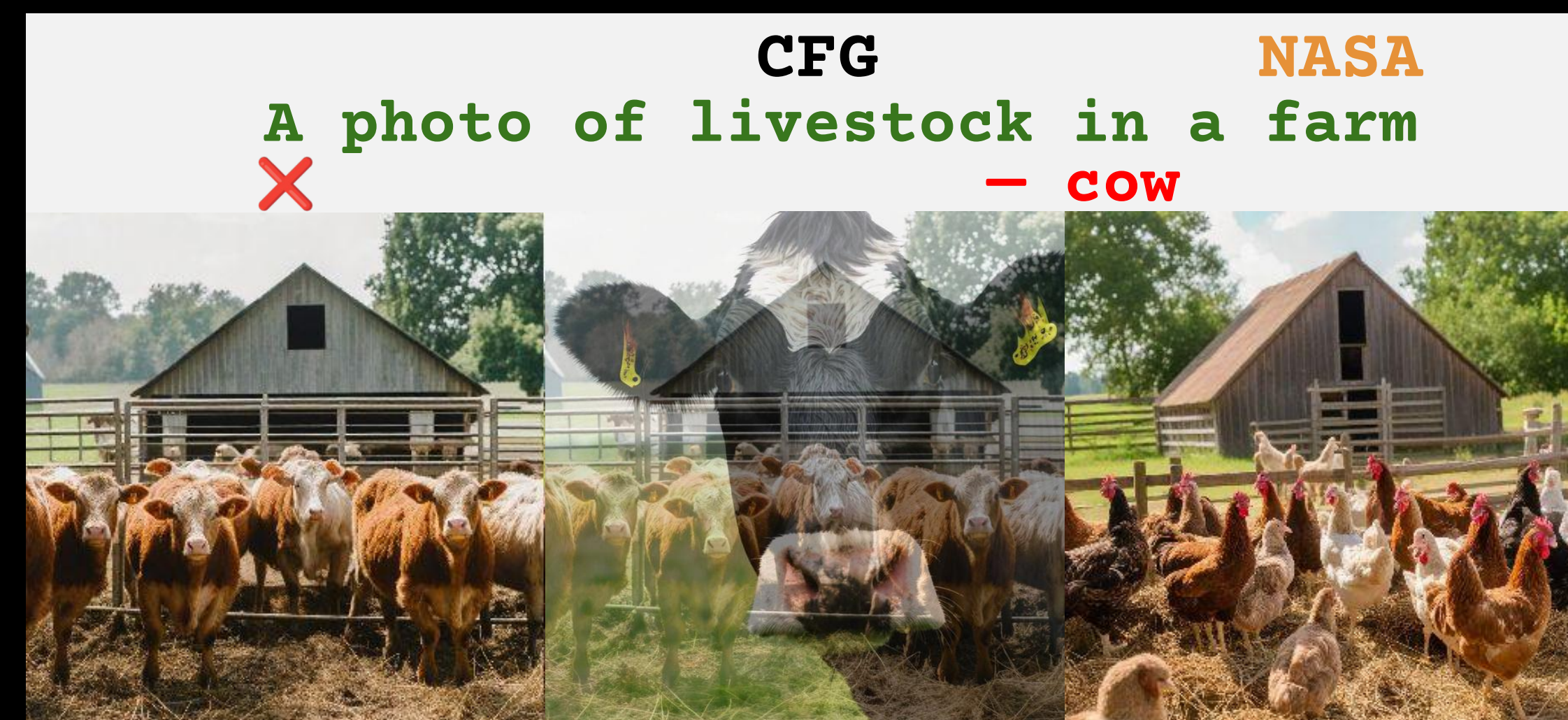


## One-Step Models are fast but **lack** negative guidance

- The Gap:** One-step models **cannot** remove unwanted features using negative prompts.
- The Flaw:** Classifier-Free Guidance (CFG), is built for multi-step models and **fails** in one step, **corrupting** the image.

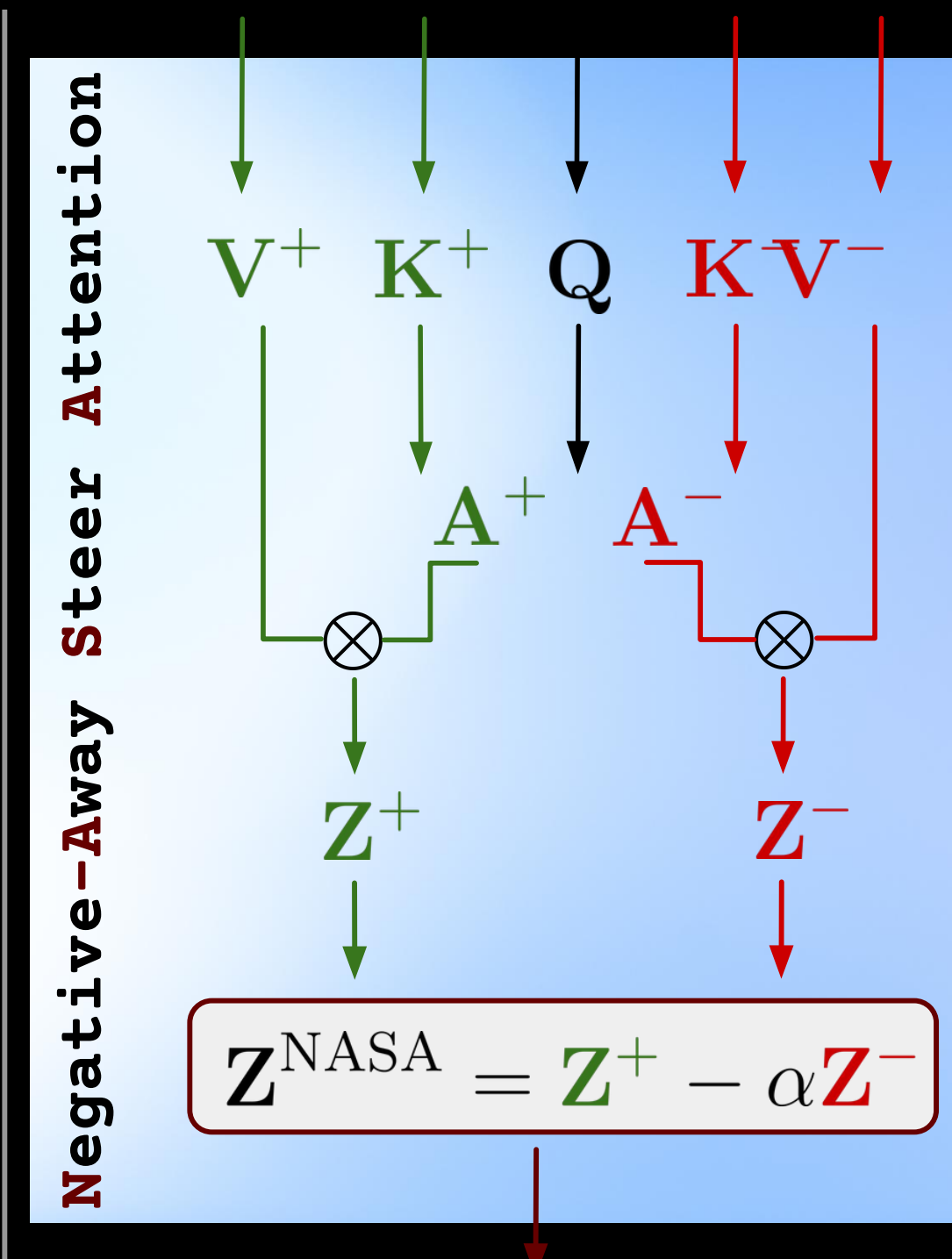
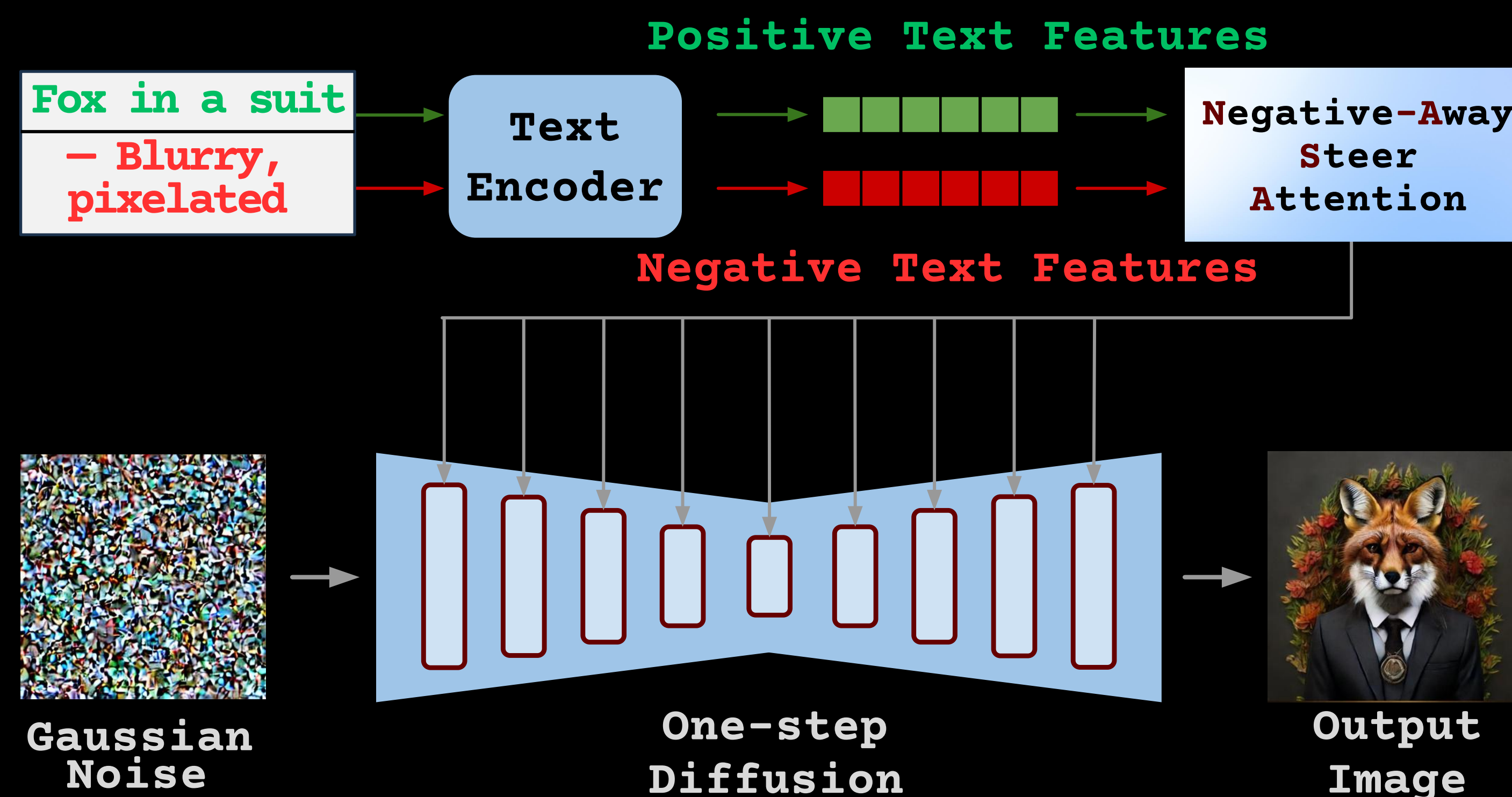
One-Step NASA  
Multi-Step CFG



## Contributions

- First** negative guidance for **one-step** and **few-steps** models, solving a critical control limitation in real-time generation.
- New State-of-the-Art** with a record **HPSv2** score of **31.21**.
- Minimal Overhead:** Only **~1.9% FLOPs** vs. **~100%** for CFG.
- Generalizability** across images (PixArt-a, **FLUX**) and video (**CausVid**) generation.

- Inference (NASA-I):** Apply to any pre-trained model for immediate negative prompt control.
- Training (NASA-T):** Integrate into distillation to train student models with **native control**, achieving **SOTA** results.



## New one-step SOTA (HPSv2 31.21)

Dataset	NegOpt		HPSv2				
Method	CLIP+ ↑	CLIP- ↓	Anime ↑	Photo ↑	CA ↑	Paintings ↑	Average ↑
PixArt-α-based backbone							
PixArt-α [Teacher]	0.35	0.05	29.62	29.17	28.79	28.69	29.07
YOSO	0.36	0.08	28.75	28.06	28.52	28.57	28.48
+ NASA-I	0.36	0.06	28.74	28.05	28.56	28.60	28.49 (+0.01)
DMD	0.35	0.08	29.31	28.67	28.46	28.41	28.71
+ CFG = 1.5	0.34	0.09	30.02	27.07	28.36	28.07	28.38 (-0.33)
+ CFG = 2.5	0.31	0.13	26.74	23.86	25.13	24.66	25.10 (-3.61)
+ NASA-I	0.35	0.05	29.33	28.71	28.49	28.53	28.77 (+0.06)
SBv2*	0.36	0.09	32.19	29.09	30.39	29.69	30.34
+ NASA-I	0.36	0.06	32.60	29.58	31.09	30.65	30.98 (+0.64)
+ NASA-T	0.35	0.08	32.33	29.26	30.75	30.10	30.61 (+0.27)
+ NASA-T + CFG = 1.5	0.34	0.10	29.47	26.50	28.22	27.68	27.97 (-2.37)
+ NASA-T + NASA-I	0.35	0.05	32.65	29.65	31.45	31.06	31.21 (+0.87)

(A) On the **NegOpt** benchmark (30k prompt pairs).  
CLIP+/- measures **positive/negative** prompt alignment.

State-of-the-art

Method	FLUX.1-schnell		SDXL-LCM		SDXL-DMD2	
	4 steps	1 step	4 steps	1 step	4 steps	1 step
None	23%	44%	43%	-	27%	25%
CFG	30%	0%	14%	-	25%	0%
NASA-I	100%	99%	97%	-	100%	100%

(B) NASA-I achieves **97-100% success** in removing unwanted features where **CFG** **fails** in few- & one-step models.

Method	VBench-Long benchmark	
	Aesthetic Quality ↑	Imaging Quality ↑
None	61.98	67.12
NASA-I	63.33	67.36

(C) Applied to the **CausVid** video model, NASA-I **improves both** aesthetic and imaging quality.