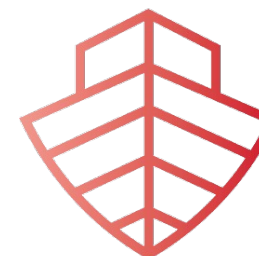


DreamControl: Control-Based Text-to-3D Generation with 3D Self-Prior

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2D Lifting Generation

- Inconsistency / Janus Problem



Multiple Heads



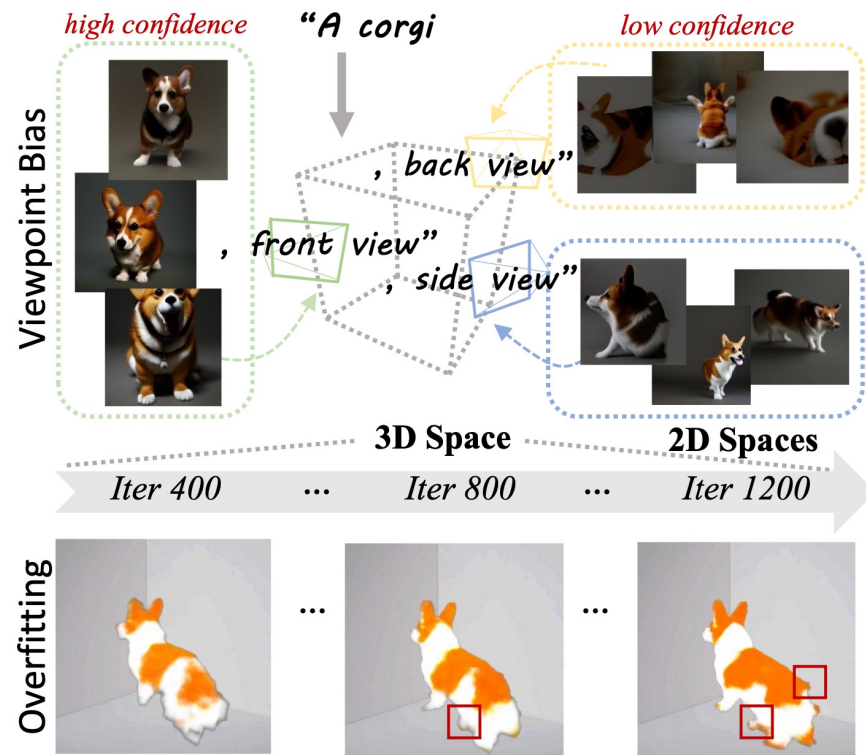
Content Drifting



Janus

DreamControl - Observation

- Learn geometry Prior from 3D Data – limited vocabulary, low fidelity
- Reasons for Inconsistency



$$\min_{\theta \in \Theta} \mathcal{L}_{\text{SDS}}(\theta) \iff \min_{\theta \in \Theta} D_{\text{KL}}(q_t^\theta(x_t|y, c) || p_t(x_t|y, c)),$$

1. viewpoint bias of 2D diffusion models
2. overfit of SDS optimization

DreamControl - Method

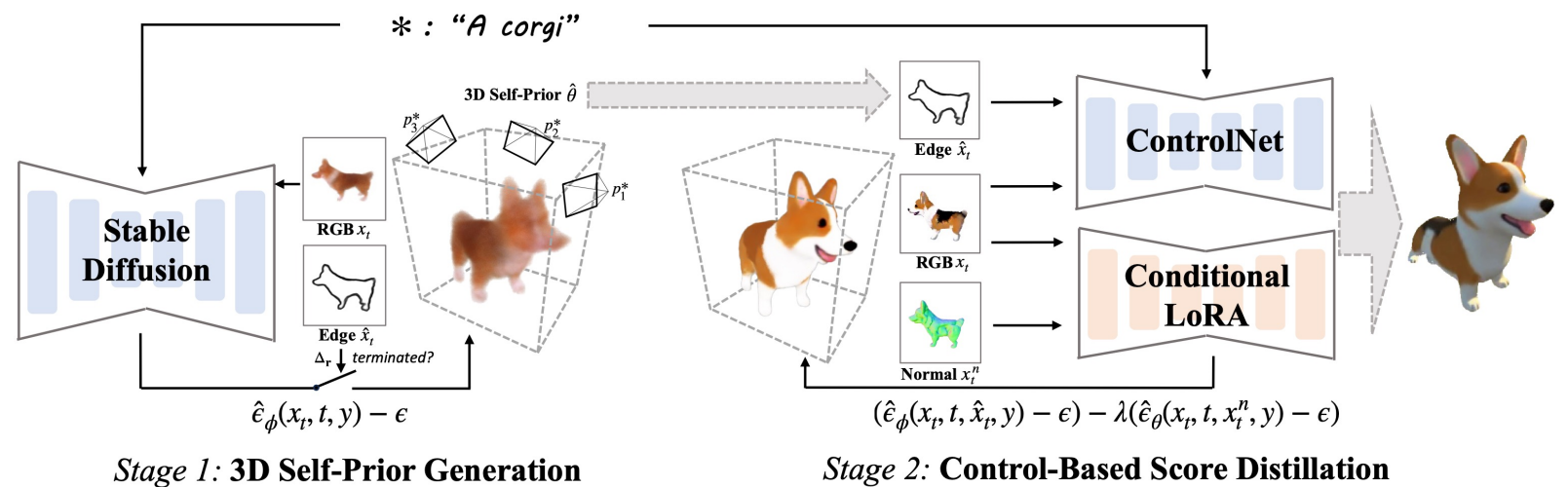
- Two-Stage Control-Based Generation

Stage 1: generate a coarse shape

- Adaptive Viewpoint Sampling
- Early Stop Judgement

Stage 2: generate high-quality results, conditioned by coarse shapes

- ControlNet and Conditional LoRA
- Fused Score



DreamControl - Experiments

- Text-to-3D



"Lionel Messi in a suit, holding the Ballon d'Or"



"Elon Musk, using a laptop"



"Batman is riding a moto"



"An astronaut is riding a horse"



"Michelangelo style statue of dog reading news on a cellphone"



"A chimpanzee dressed like Henry VIII king of England"



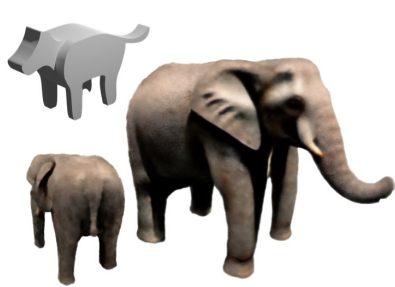
"Tower Bridge made out of gingerbread and candy"



"A plate of fried chicken and waffles with maple syrup on them"

DreamControl - Experiments

- User-Guided Generation



"An elephant"



"A classic Packard car"



"A teddy bear"



"A Gundam with golden armor"

- 3D Animation



"Spiderman"

Woody - making a high jump



a horse - galloping



DreamControl - Experiments

- Comparing with SOTA Methods:
 - DreamFusion, Magic3D, ProlificDreamer
 - Zero-1-to-3, MVDream

Method	JR(%)↓	PS(%)↑	CS(%)↑
DreamFusion-IF [25]	36.67	10.01	26.36
Magic3D [15]	53.33	16.13	26.59
ProlificDreamer [32]	56.67	20.81	26.69
Zero-1-to-3 [16]	16.67	7.89	21.25
MVDream [30]	10.00	17.70	26.17
DreamControl (ours)	10.00	27.46	28.14

- Quantitative Results



- Qualitative Results

Thank you!