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Paper

Code

HuGeDiff: 3D Human Generation via Diffusion with Gaussian Splatting

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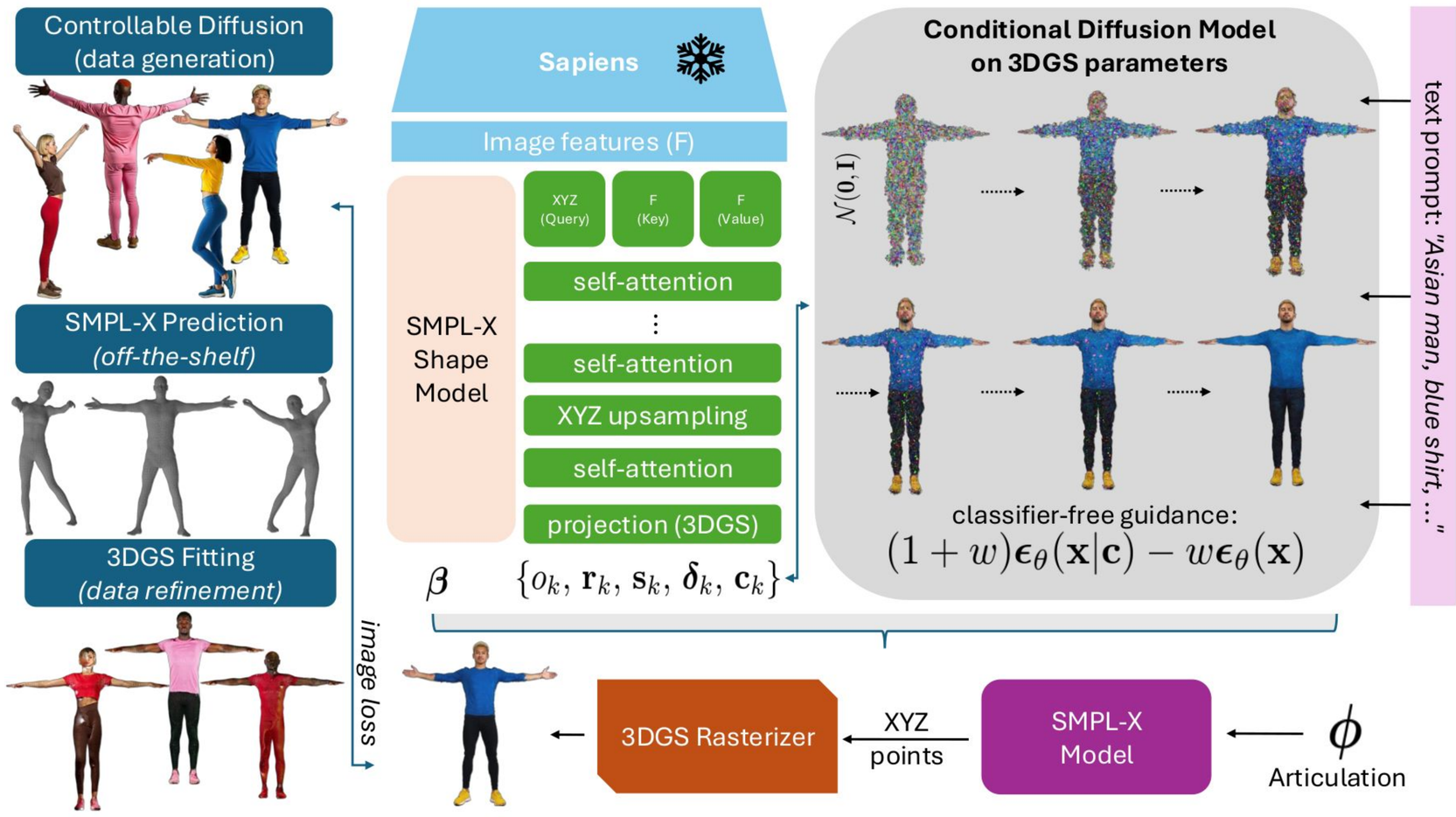
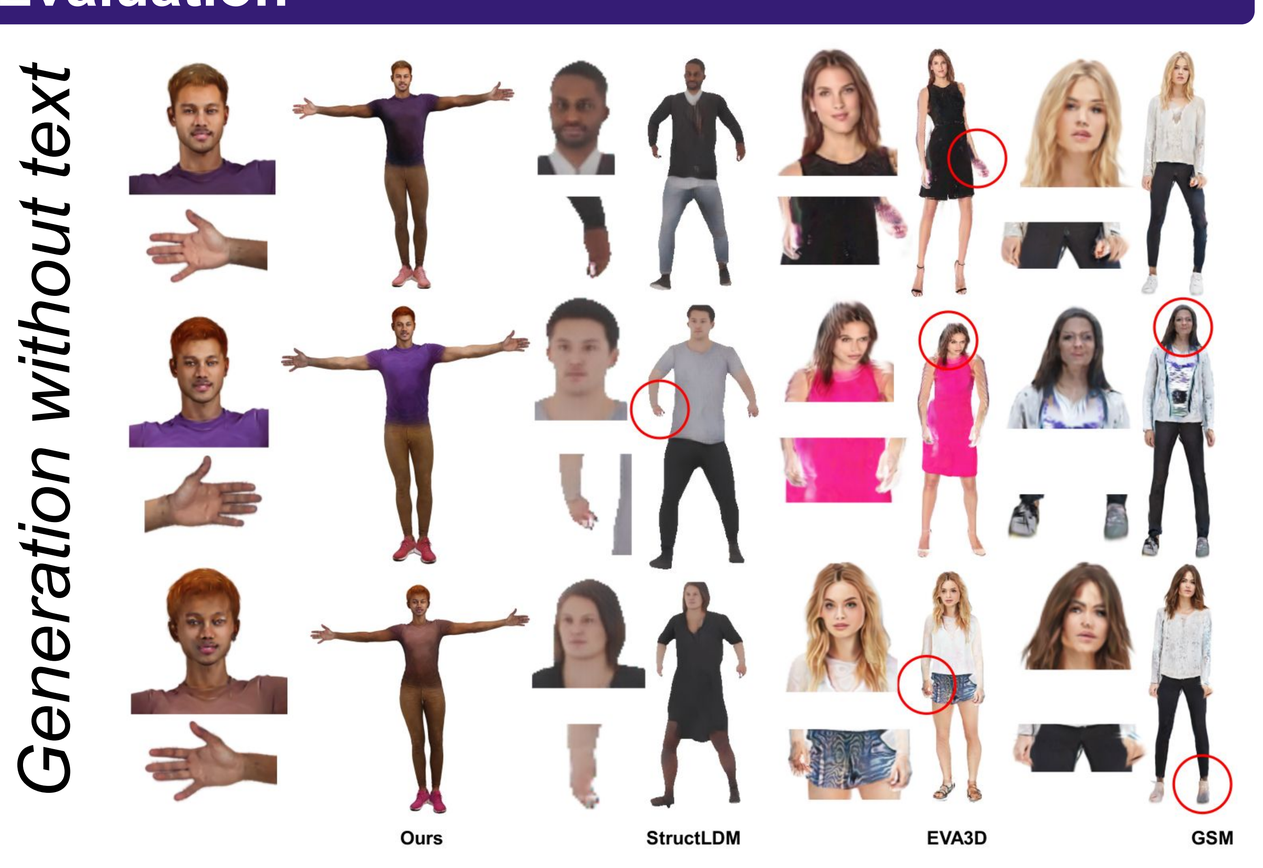
About

- 3D Gaussian splatting human appearance generation from text
- We create AI human dataset using photorealistic diffusion model
- Reconstruct SMPL-X pose angles and shape
- Reconstruct 3DGS appearance from a single image using cross-attention
- Train a text-conditioned diffusion model for 3DGS appearance generation

Method



Qualitative Evaluation



Quantitative Evaluation

Method	Time (minutes)	Method	Time (minutes)
HumanGaussian	68.79	DreamWaltz-G	201.95
TADA	191.74	DreamAvatar	350.50
GaussianDreamer	11.66	SMPLitex	0.29
EVA3d*	0.16	StructLDM*	0.10
GSM*	0.12	Ours	0.31

- We are faster than methods in text-conditioned generation
- Our model generates human appearances with better text alignment and aesthetics across different LLMs
- Our method ranked first in the preference ranking via LLM

Method	Google Gemini preference ranking (%)		
	1st	2nd	3rd
TADA	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
HumanGaussian	0.00 ± 0.00	2.22 ± 3.14	93.33 ± 5.44
DreamAvatar	0.00 ± 0.00	4.44 ± 3.14	0.00 ± 0.00
GaussianDreamer	0.00 ± 0.00	2.22 ± 3.14	2.22 ± 3.14
DreamWaltz-G	11.11 ± 15.71	80.00 ± 18.86	4.44 ± 3.14
SMPLitex	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ours	**88.89 ± 15.71**	11.11 ± 15.71	0.00 ± 0.00

Method	Le Chat Aln./Aes.	Gemini Aln./Aes.	Grok Aln./Aes.	Claude Aln./Aes.	Copilot Aln./Aes.
TADA	77.7/68.3	62.7/46.7	49.0/38.7	82.7/76.1	81.9/75.9
HumanGaussian	85.3/75.7	76.0/62.3	76.3/67.0	83.7/75.8	86.0/72.7
DreamAvatar	73.3/70.0	61.0/38.7	59.3/38.7	83.0/81.1	85.0/68.7
GaussianDreamer	82.7/68.7	49.7/43.7	35.3/42.3	65.0/79.3	84.3/77.2
DreamWaltz-G	86.3/78.7	58.7/63.0	60.3/70.0	62.0/78.0	72.3/76.3
SMPLitex	58.6/72.0	32.7/11.3	21.7/32.0	47.3/71.7	66.7/59.4
Ours	**89.3/91.0**	**83.3/74.7**	**93.0/85.5**	**95.0/85.0**	**88.3/82.6**