HumanGaussian: Text-Driven 3D Human Generation with Gaussian Splatting

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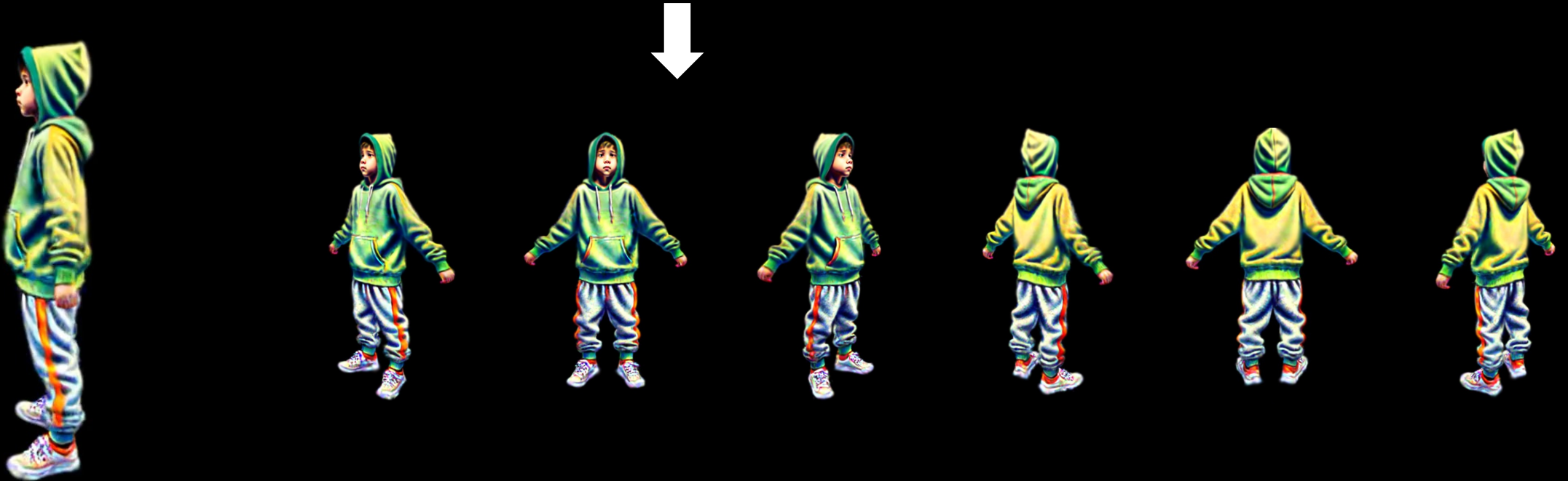
CVPR
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Problem Setting

Text Prompt: A boy with a beanie wearing a hoodie and joggers.

We present an efficient yet effective framework **HumanGaussian**. Given a text prompt, it can generate high-quality 3D humans with fine-grained geometry and realistic appearance.

First, we show the visual comparisons with recent state-of-the-art baselines.

Comparison Methods

- Category 1 - General Text-to-3D Models:

  - 1. DreamGaussian, Tang *et al.*, arXiv:2309.16653, 2023.
  - 2. GaussianDreamer, Yi *et al.*, arXiv:2310.08529, 2023.

- Category 2 - Specialized Text-to-3D Human Models:

  - 3. TADA, Liao *et al.*, 3DV, 2024.
  - 4. DreamHuman, Kolotouros *et al.*, arXiv:2306.09329, 2023.

Visual Comparison Results (1/5).

Text Prompt: A Black man wearing a green t-shirt.

Ours DreamGaussian GaussianDreamer TADA DreamHuman

Text Prompt: A Black woman wearing a hoodie.

Ours   DreamGaussian   GaussianDreamer   TADA   DreamHuman

Text Prompt: A woman wearing ski clothes.

Ours   DreamGaussian   GaussianDreamer   TADA   DreamHuman

Text Prompt: A Black man wearing a red baseball cap.

Ours   DreamGaussian   GaussianDreamer   TADA   DreamHuman

Visual Comparison Results (5/5).
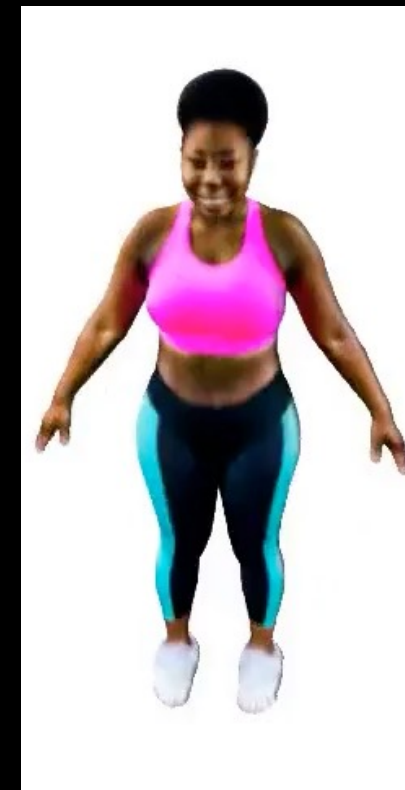
Text Prompt: A Black woman dressed in gym clothes.

Ours   DreamGaussian   GaussianDreamer   TADA   DreamHuman

Then, we show more qualitative results of our proposed framework.

Text Prompt: A man with a black hat and sunglasses.

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Text Prompt: A man with a buzz cut wearing a red t-shirt.

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Text Prompt: A woman with a side shave wearing a black t-shirt.

HumanGaussian: Text-Driven 3D Human Generation with Gaussian Splatting.

Text Prompt: A man with a messy hair wearing a gray sweater.

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More Qualitative Results (5/15).

Text Prompt: A Black woman wearing sunglasses, a white t-shirt and jeans.

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Text Prompt: A person with a curly beard and a black hoodie.

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A Viking.

A body builder wearing a tanktop.

A Texas ranger.

HumanGaussian: Text-Driven 3D Human Generation with Gaussian Splatting.

A bounty hunter.

A cyborg.

A demon slayer.

HumanGaussian: Text-Driven 3D Human Generation with Gaussian Splatting.

A dryad.   A fairy.   A knight.

HumanGaussian: Text-Driven 3D Human Generation with Gaussian Splatting.

A philosopher.

A vampire hunter.

A revenant.

HumanGaussian: Text-Driven 3D Human Generation with Gaussian Splatting.

A vampire.

A vigilante.

A warlock.

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An alchemist.

An alien.

An astrologer.

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Text Prompt: A man with a [X] fedora and a denim jacket.

[X] = Black

[X] = Brown

HumanGaussian: Text-Driven 3D Human Generation with Gaussian Splatting.

More Qualitative Results (14/15).

Text Prompt: A woman with a [X] beanie.

[X] = Pink

[X] = Yellow

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More Qualitative Results (15/15).

Text Prompt: A man with a [X] fedora and a leather jacket.

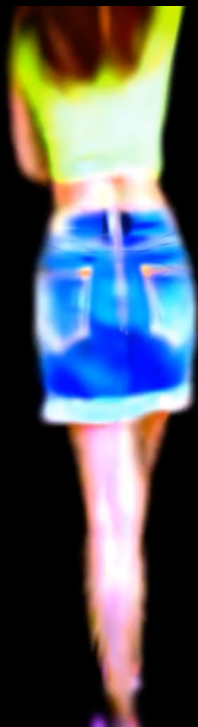[X] = Black   [X] = Blue   [X] = Green   [X] = Red

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Besides, we show the ablation study results.

Ablation Study Results (1/1).

Text Prompt: A woman wearing a short jean skirt, a cropped top, and a white sneaker.

(A) baseline   (B) + SMPL-X, Pose-Cond.   (C) + Neg. Guidance, CFG=7.5   (D) + Dual-Branch SDS   (E) + Size-based Prune (Full)

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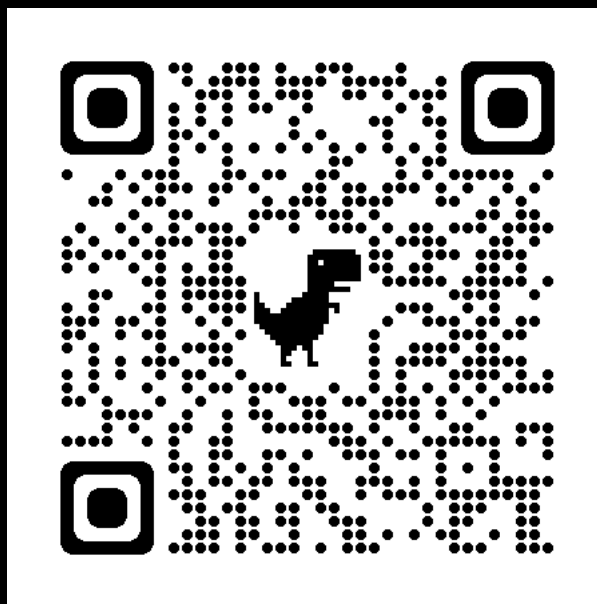
Finally, we show the zero-shot animation.

Zero-Shot Animation Results (1/1).

Motion Source: AMASS Dataset, Aeroplane FW Part 9.

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Thank you for watching!

https://alvinliu0.github.io/projects/HumanGaussian