

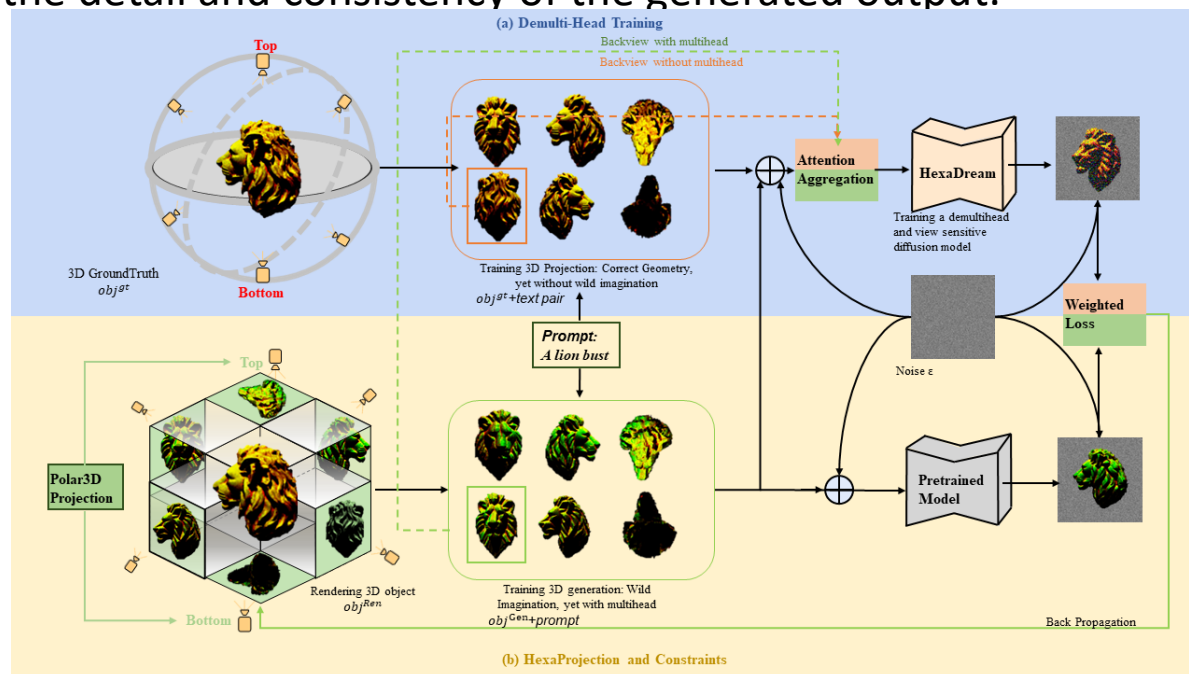
HexaDream: Hexaview Prior and Constraint for Text to 3D Creation

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Problems & Ideas

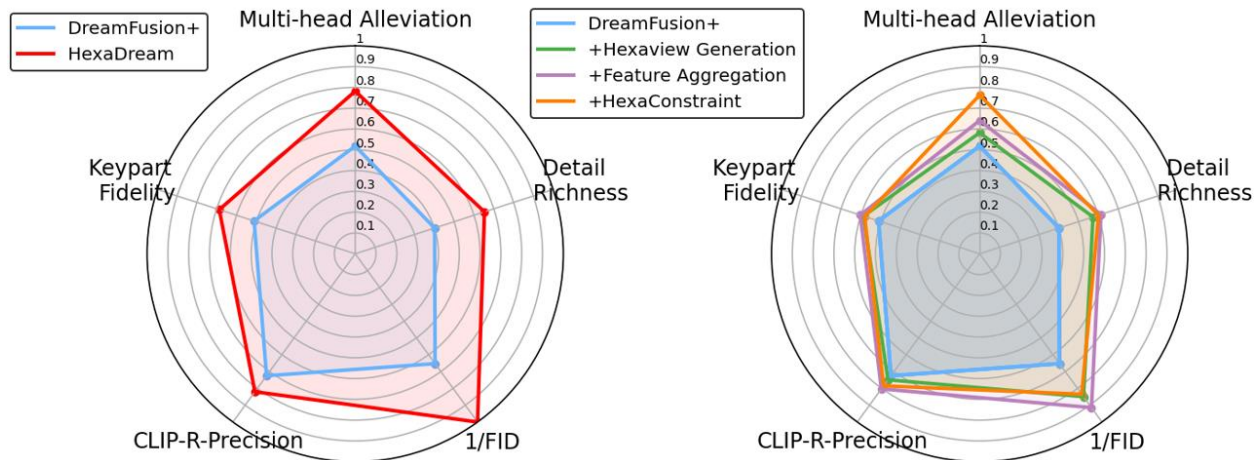
- Problems of conventional text to 3D generation:
 - In the field of AI-generated creative content (AIGC), text-to-3D generation faces issues such as inconsistency and low resolution, mainly due to the lack of critical visual cues like views and attributes..
 - Random constraints in rendering may impair model inference, leading to the Janus problem.
- Ideas: We propose the HexaDream framework, utilizing the Hexaview Generation Diffusion Model to merge object types, attributes, and view-specific text into a unified latent space, and employing a feature aggregation attention mechanism to enhance the detail and consistency of the generated output.



The HexaDream Framework.

Main Contributions

- Contributions:
 - We introduce the Hexaview Generation Diffusion Model, capable of generating six orthogonal views of 3D images, thus addressing the geometric distortion caused by missing viewpoints in traditional methods;
 - We employ a feature aggregation attention mechanism, which aggregates multi-view information to ensure the consistency and richness of details in the generated 3D objects, effectively improving generation quality;
 - Extensive experiments demonstrate the effectiveness of the model, with HexaDream showing improvements of 8% in CLIP-R, 12% in Keypart Fidelity, and 20.6% in Multihead Alleviation, significantly alleviating the multi-head problem and enhancing the consistency and fidelity of 3D objects generated from text.



HexaDream also achieves comparative performance in module level. To align with our hexa-constraint approach, we have augmented the DreamFusion methodology by adding two additional views named DreamFusion+.