

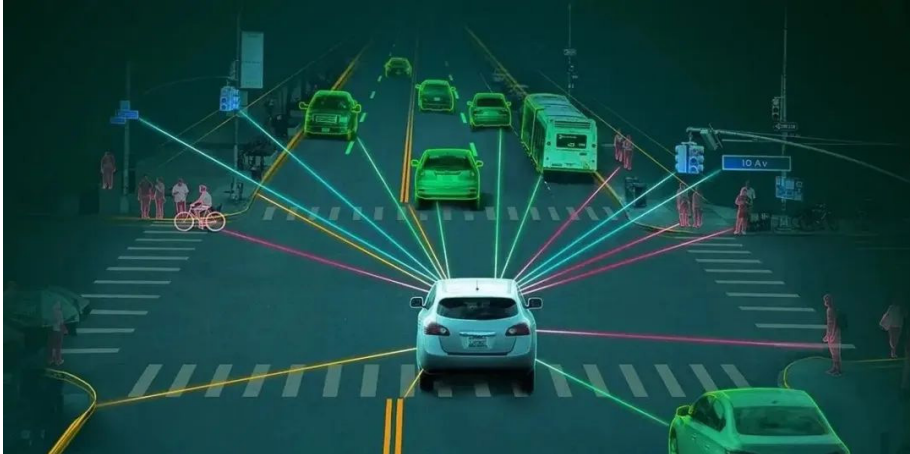
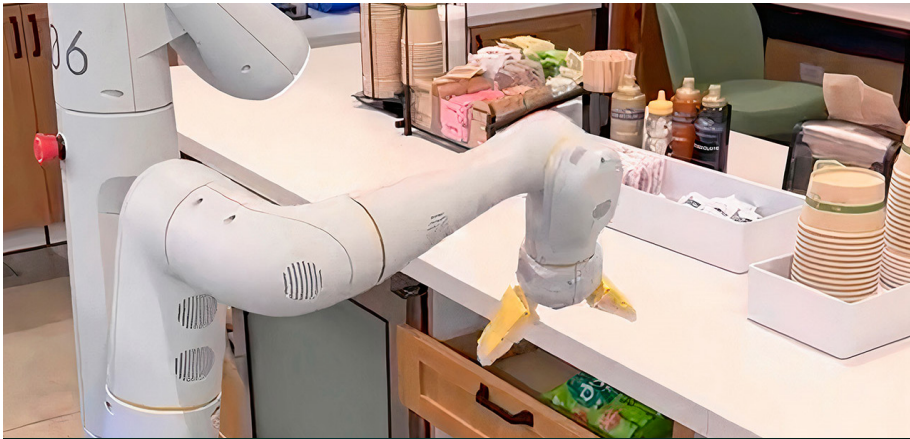
Unique3D: **High-Quality** and **Efficient** 3D Mesh Generation from a Single Image

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Importance of 3D

■ For understanding the world



■ For real-world needs

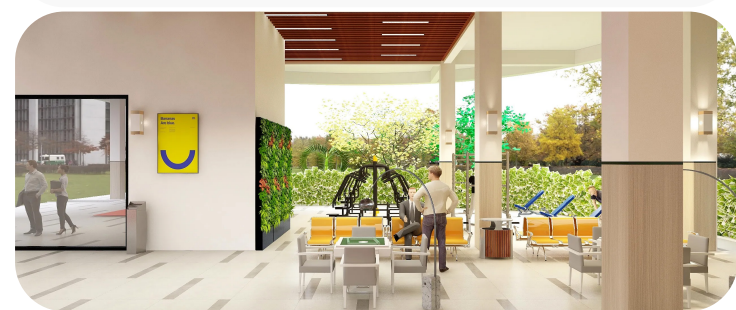
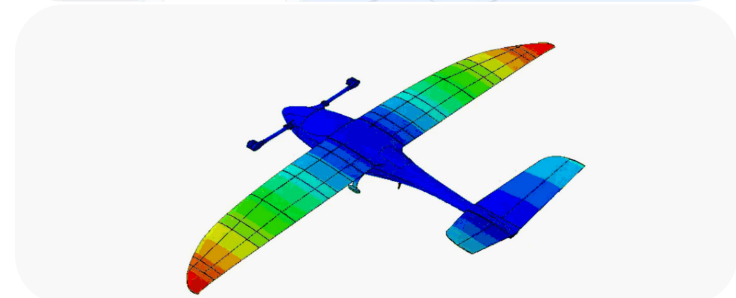
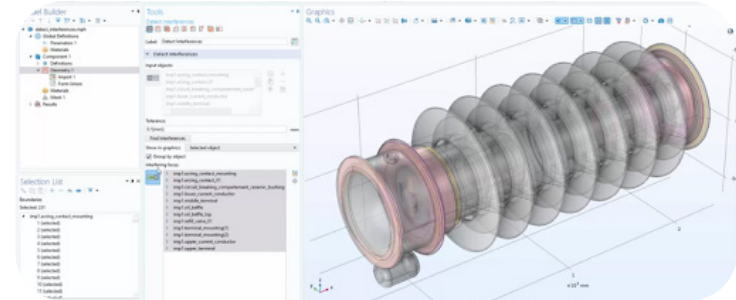


Image-to-3D Challenges

01

Limited resolution



02

Poor generalizability



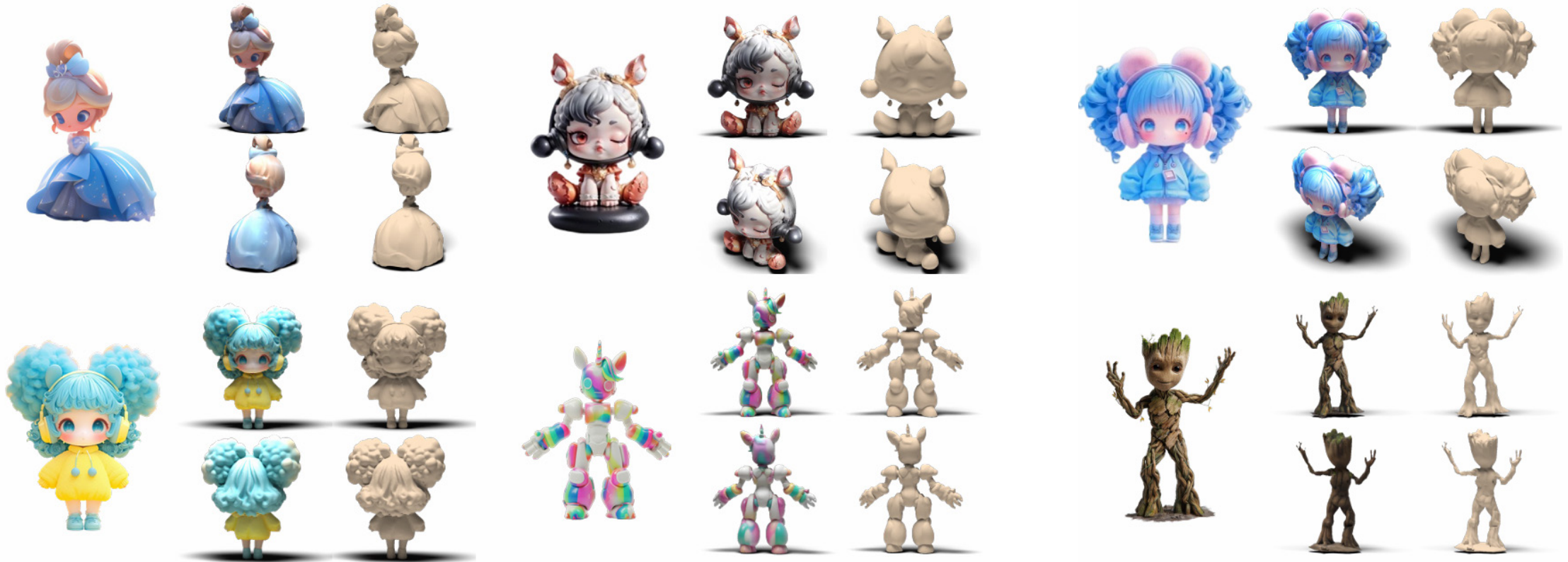
03

Low consistency between inputs and generation



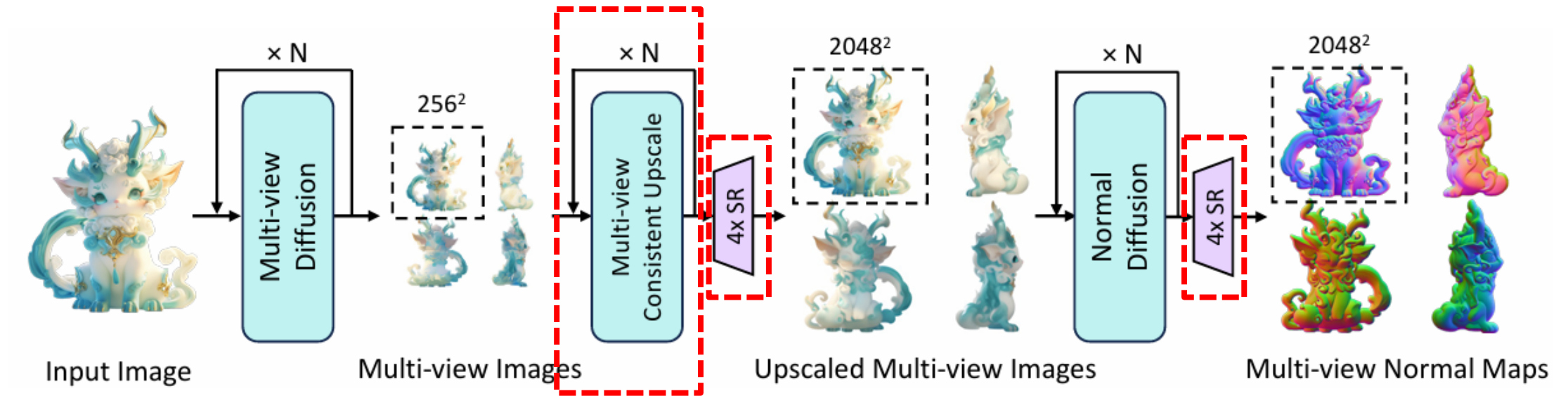
Motivation

- Extreme geometric detail and textures?
- We need high spatial resolution and multi-view resolution!



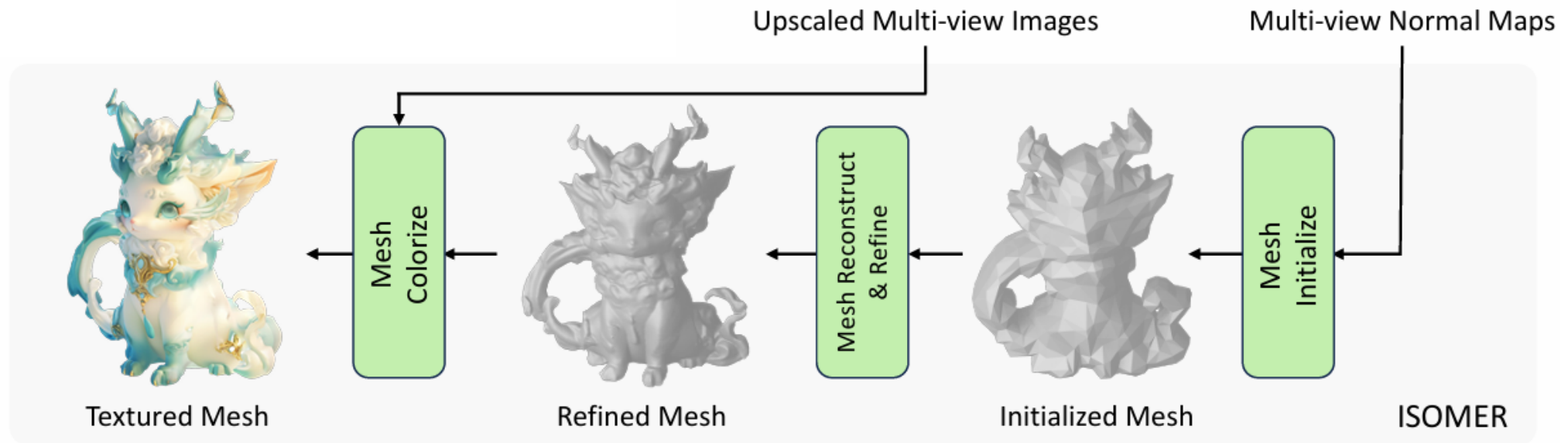
Methods

- Low image resolution?
- Super-resolution again and again.



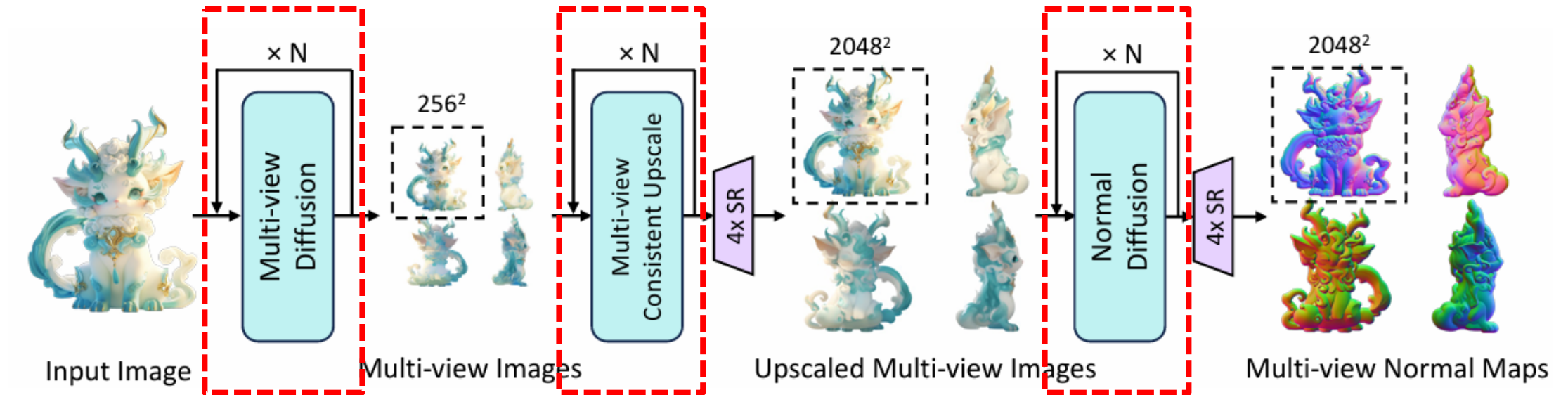
Methods

- Marching Cubes only supports up to 512 spatial resolution and is extreme slow?
- Directly reconstruct the Mesh!



Methods

- Poor generalization?
- Use more pre-training image diffusion.



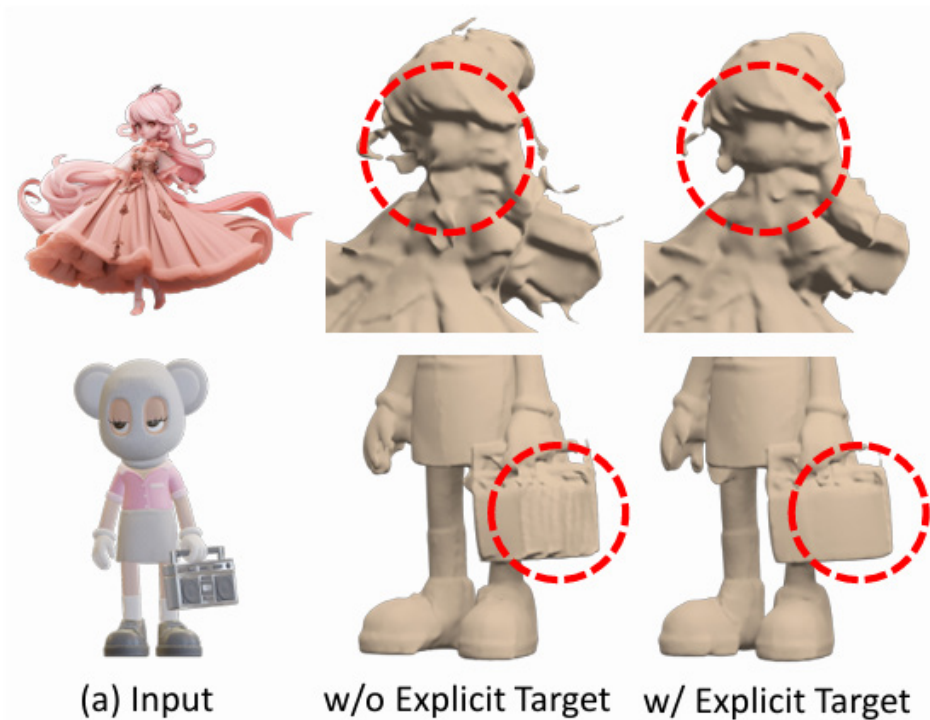
Methods

- Consistency between inputs and generation?
- Keep the front as consistent as possible.

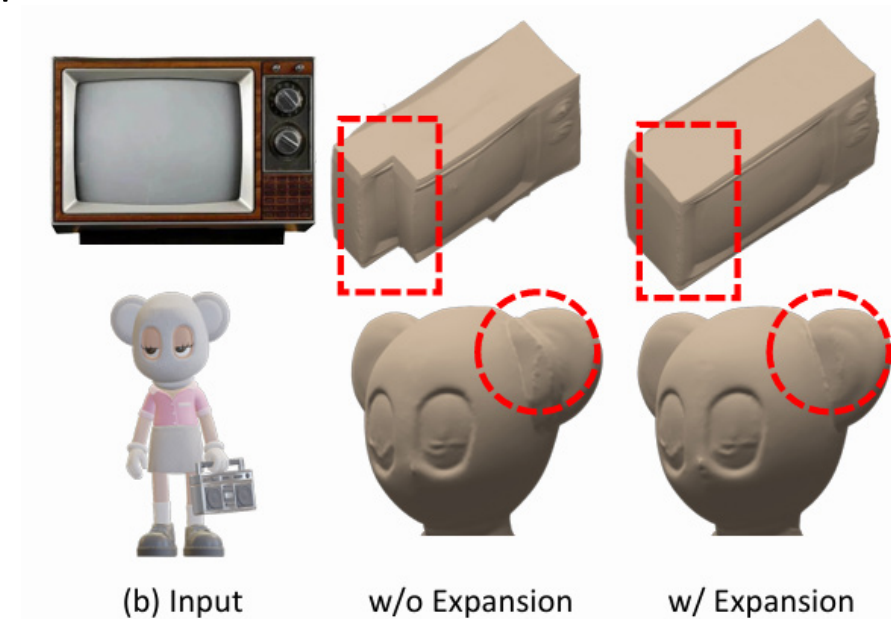


More technical challenges

- How to handle inconsistencies across multiple views?
- Project multiple views onto the object surface and perform a weighted average.



- With only four view normals as supervision, there are multiple solutions, leading to layering and collapse. What to do?
- Boost the model, like inflating a balloon, increasing expansion during the iteration process.



Results

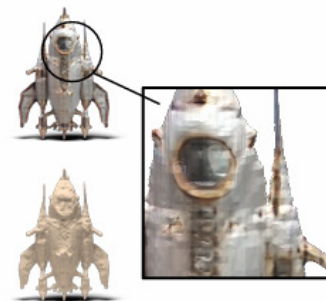
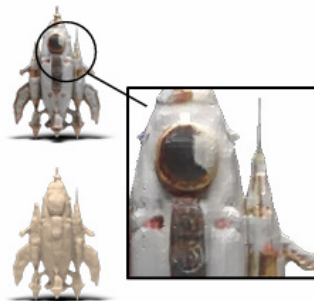
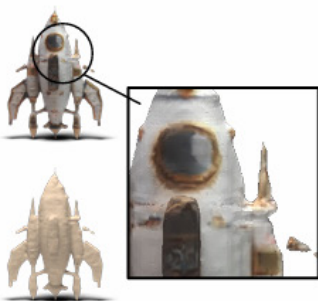
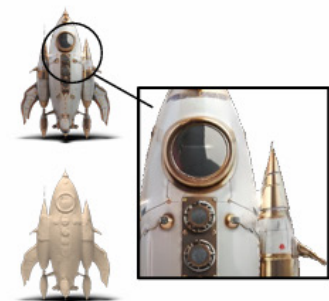
Input Image

Ours

InstantMesh

CRM

OpenLRM



Input Image
Generated Textured Mesh



Input Image

Generated Textured Mesh

Input Image

Generated Textured Mesh

