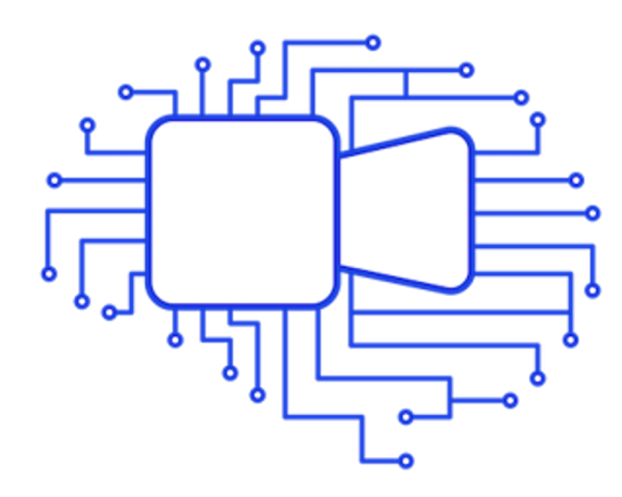
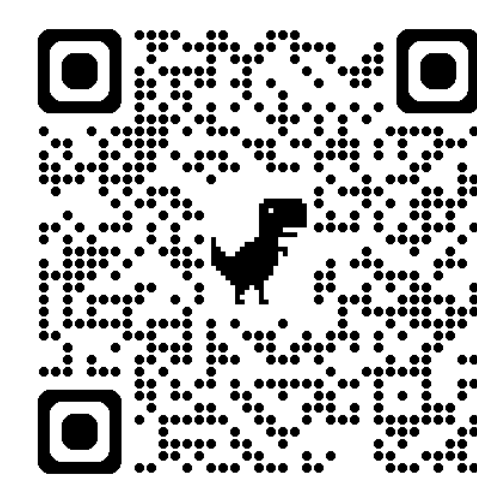


MeTTA: Single-View to 3D Textured Mesh Reconstruction with Test-Time Adaptation



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¹POSTECH **POSTECH**, ²Bucketplace **BUCKET PLACE**

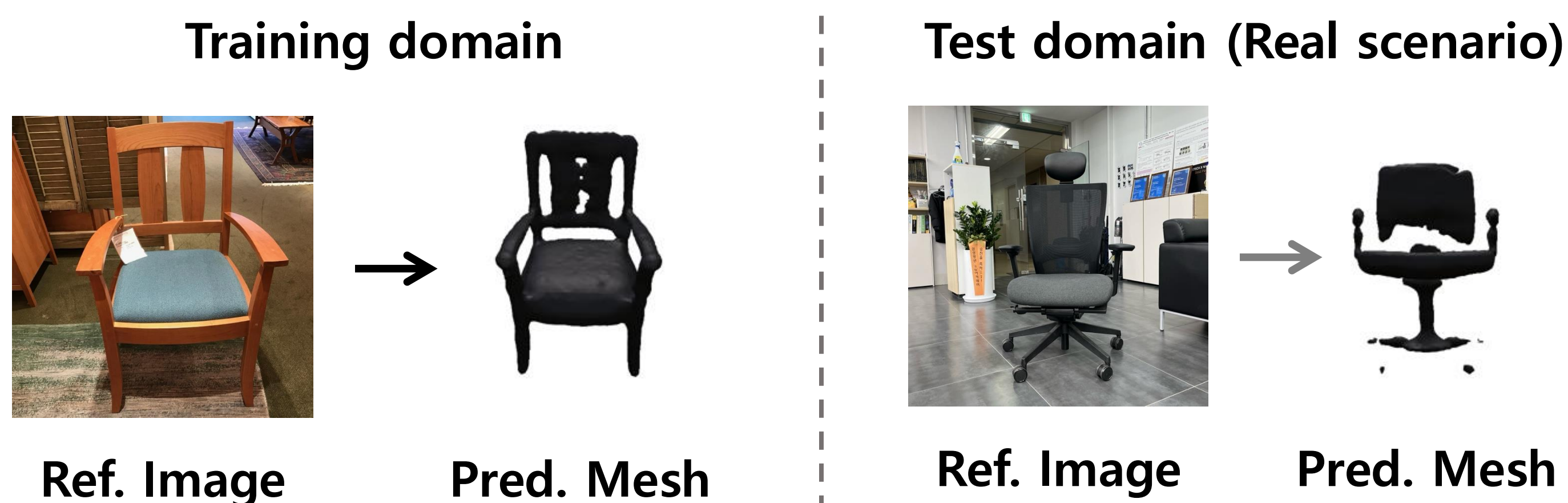


TL;DR

- **MeTTA** closes the **domain gap** between training and test time by jointly updating mesh, texture, and viewpoint
- We design **viewpoint self-calibration** and **textured mesh reconstruction** using only a single view image with generative prior
- We achieve **high-fidelity geometry** and **realistic physically based rendering (PBR) textures**

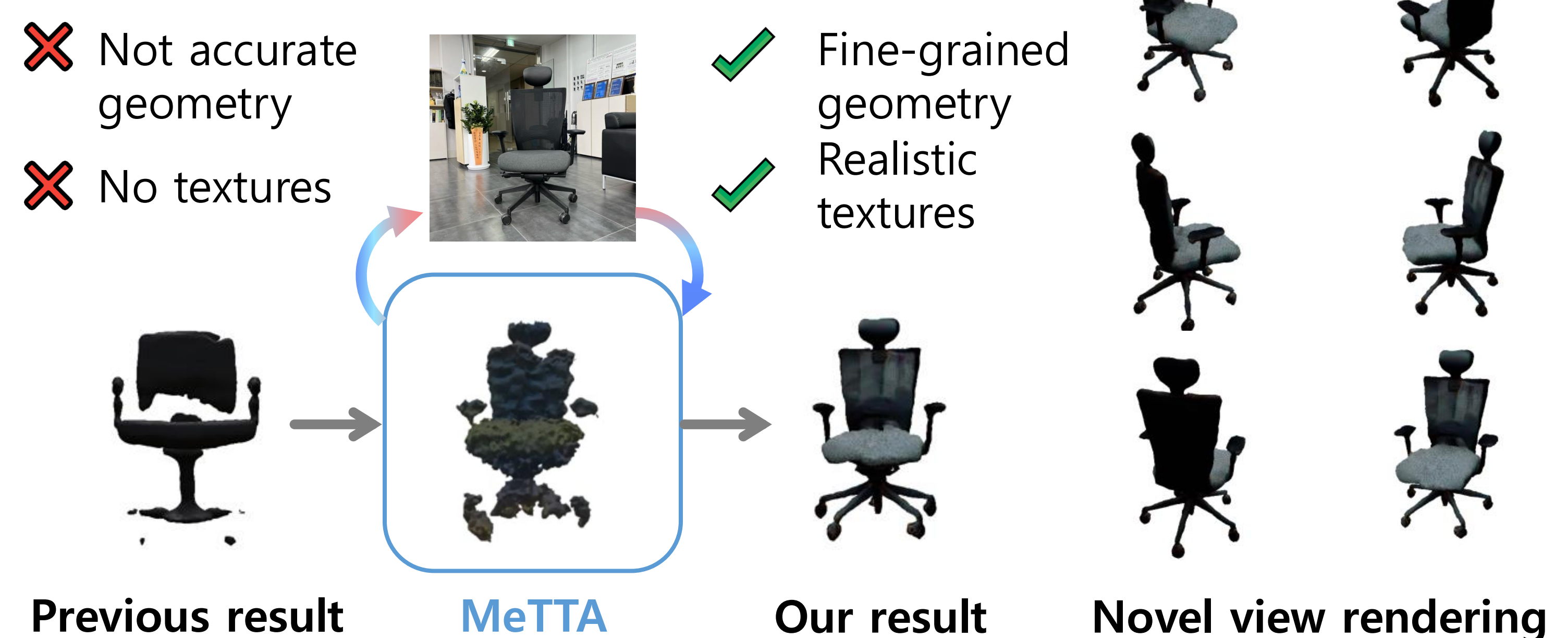
Summary

Limitation of previous methods



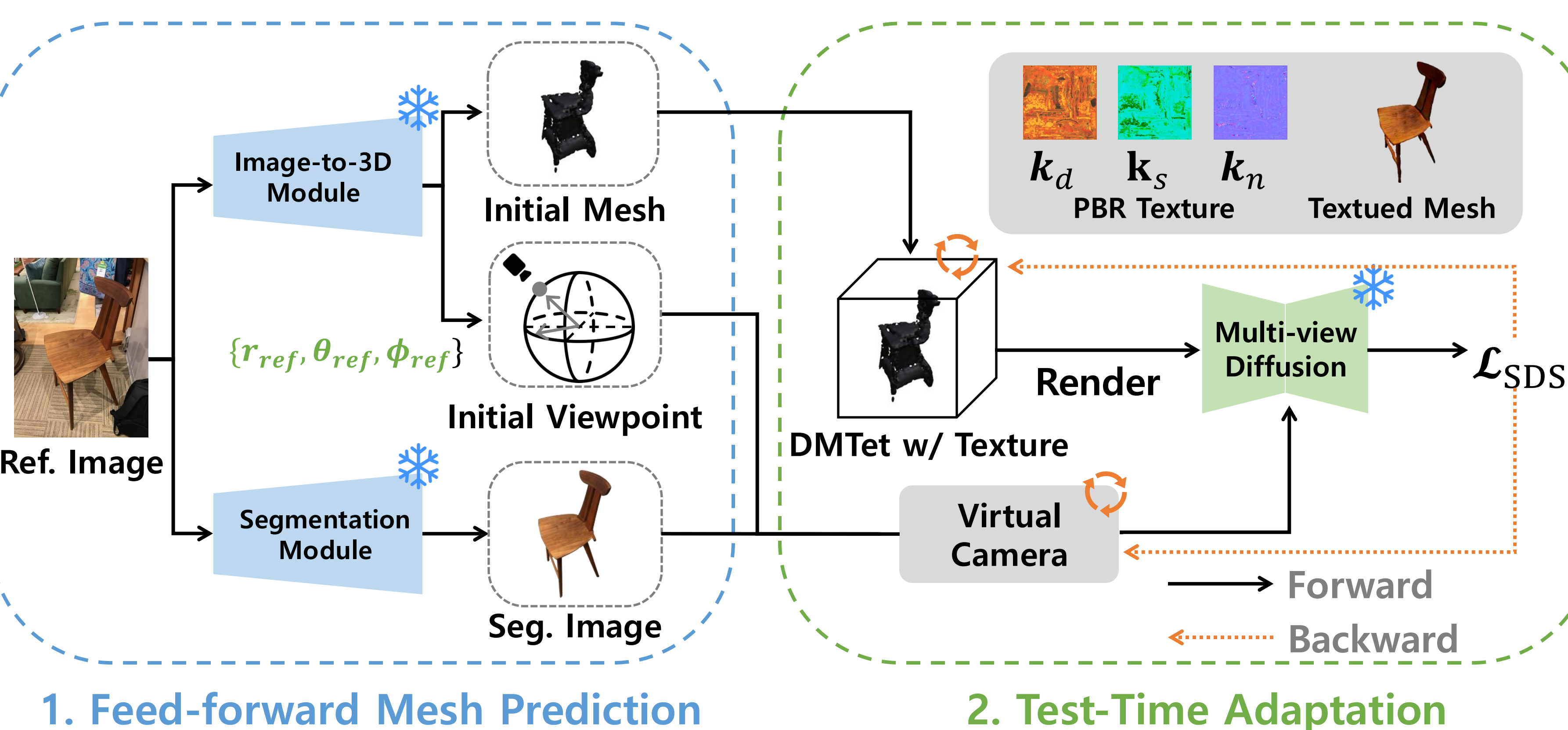
- Learning-based methods **trained on limited datasets** perform **poorly** in the **real-world tests** (**out-of-distribution; OoD**)
- Previous methods only predict coarse geometry (**no textures**)

Our proposed method

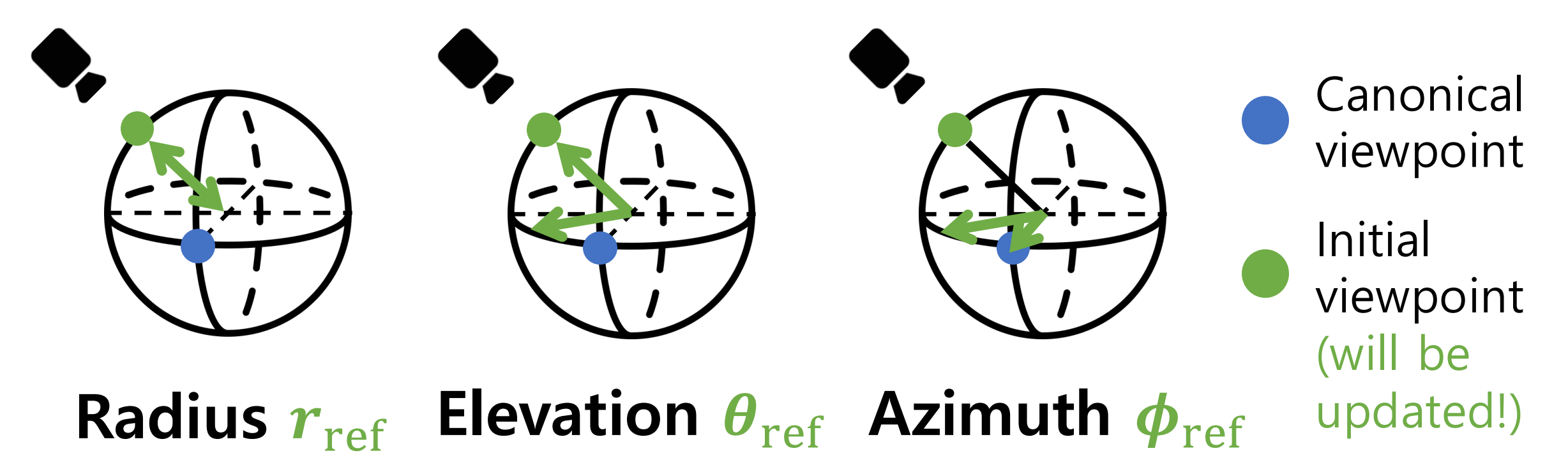


MeTTA

Overall pipeline



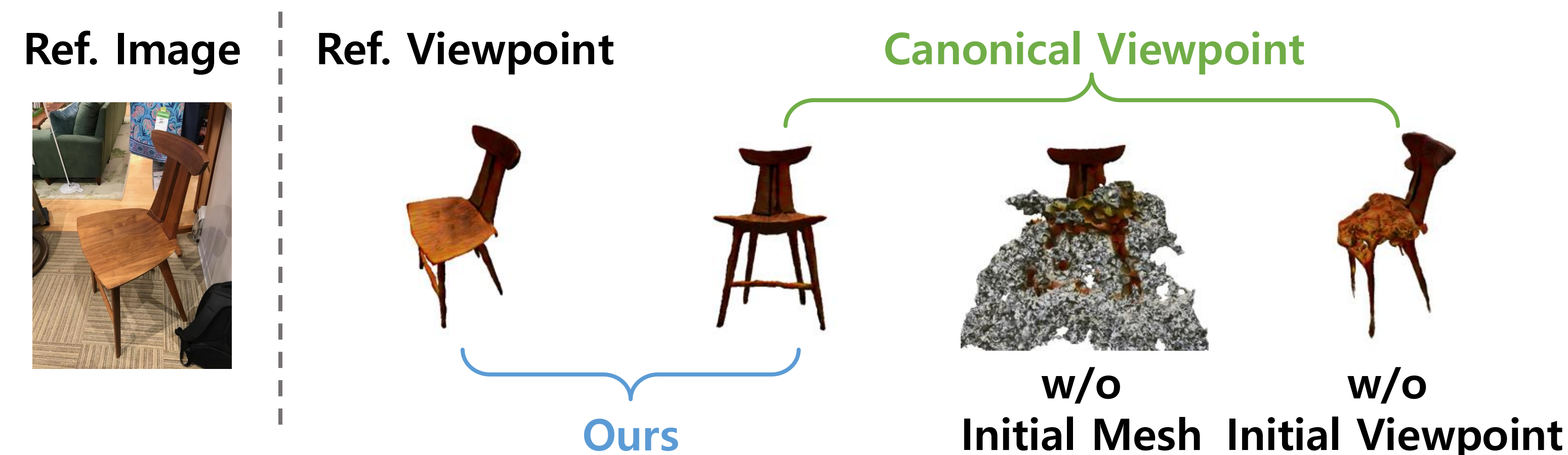
- Update **initial mesh** to **fine-grained shape** with **realistic texture** and **viewpoints aligned** with **reference image**



- Utilize **multi-view diffusion** model to **guide the adaptation** process through SDS loss
- Achieve a realistic appearance using **PBR modeling**

Experiments

Ablation studies of the pipeline design



Editing results with PBR textures



- PBR texture enable us to utilize our results in off-the-shelf graphics tools (e.g., Blender)

Comparison with feed-forward methods

Ref. Image	MGN (CVPR 2020)	LIEN (CVPR 2021)	MeTTA (Ours)
Mesh / PBR Texture	✓ / ✗	✓ / ✗	✓ / ✓

Comparison with iterative methods using generative priors

Ref. Image	RealFusion (CVPR 2023)	Zero123 (ICCV 2023)	Make-It-3D (ICCV 2023)	MeTTA (Ours)