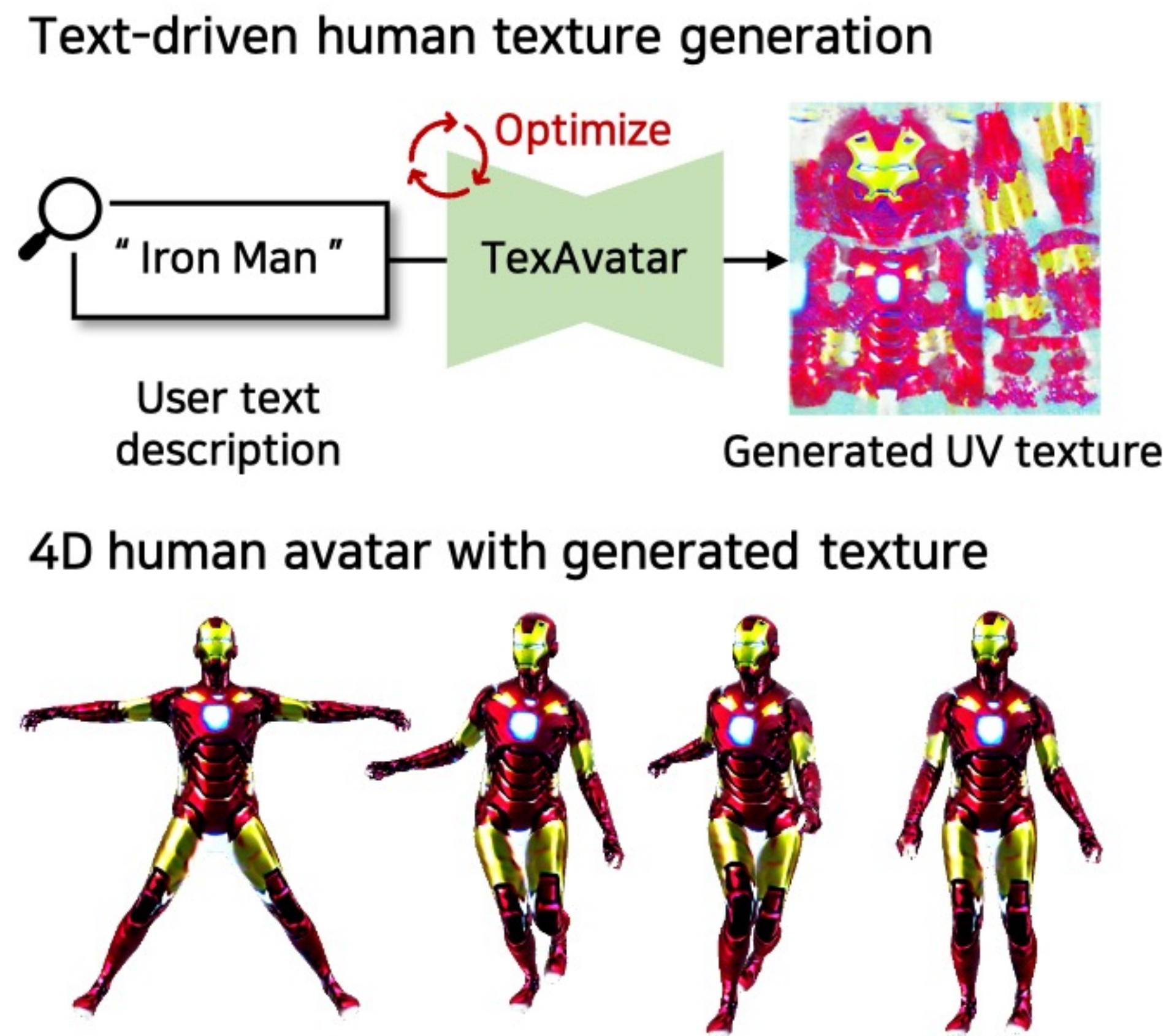


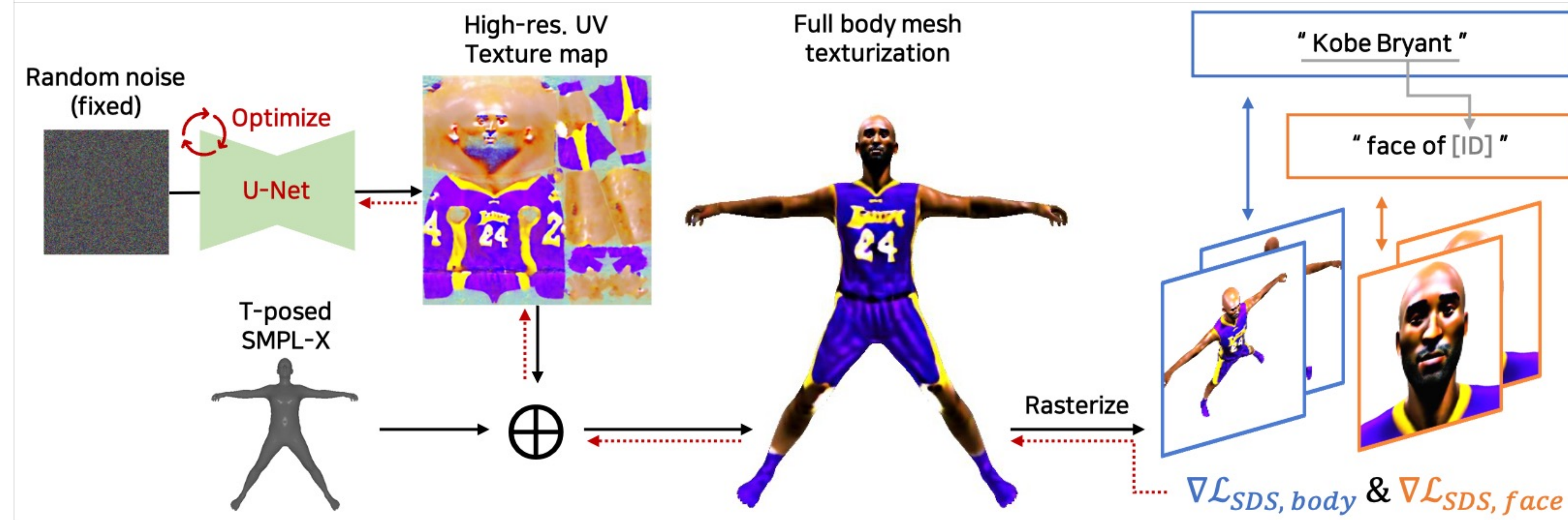
Text-driven Human Avatar Generation by Neural Re-parameterized Texture Optimization

Kim Youwang Tae-Hyun Oh

TexAvatar

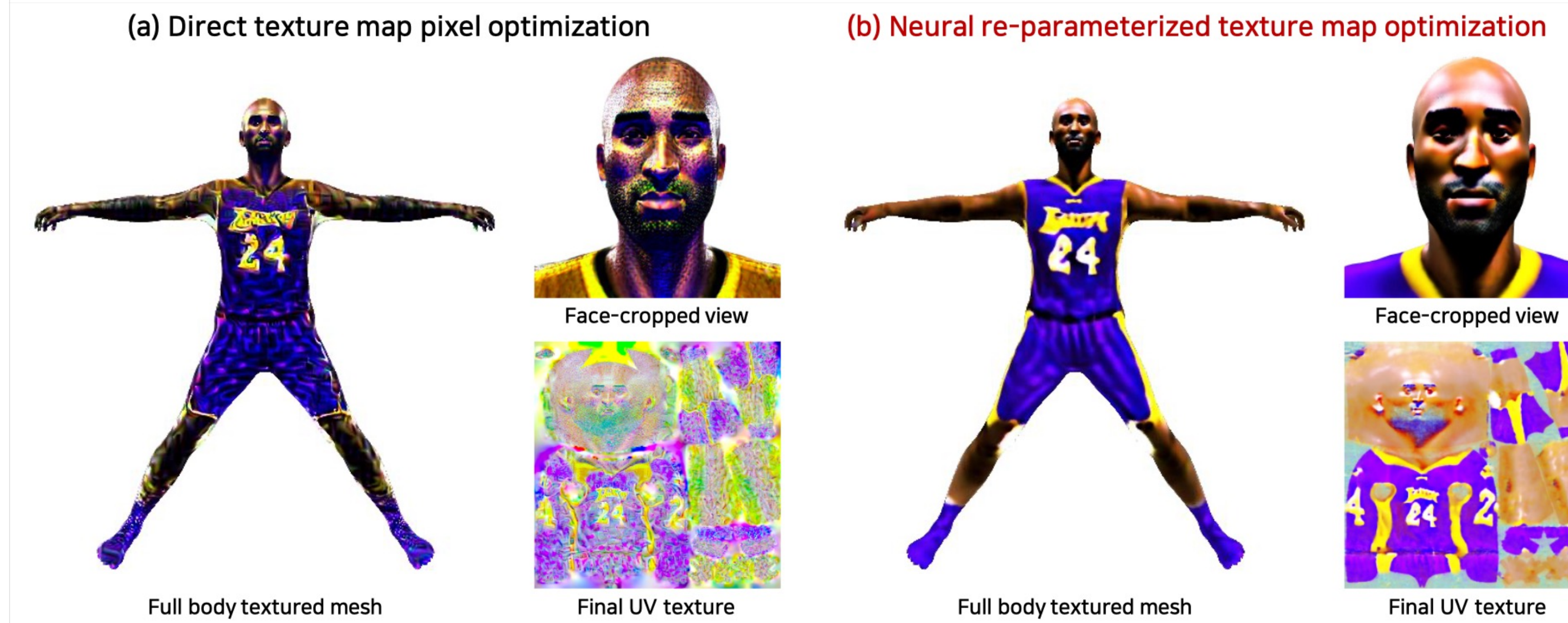


Neural re-parameterized texture optimization



- Optimizes a high-res. UV texture map, re-parameterized with a randomly initialized U-Net
- Use a pre-trained text-to-image diffusion model for the supervision (SDS loss)

Effects of neural re-parameterization



- CNN parameterization helps learn locally smooth texture
- Direct UV optimization adjusts non-coupled variables 🙄 Hard!

Strengths of TexAvatar

	AvatarCLIP (SIGGRAPH 2022)	DreamAvatar (arxiv 2023)	AvatarCraft (ICCV 2023)	DreamWaltz (arxiv 2023)	TexAvatar (Ours)
3D representation	NeuS (SDF)	NeRF	NeuS (SDF)	NeRF	Mesh
Optimization time	~ 6 hrs	~ 2 hrs	~ 3 hrs	~ 2 hrs	< 0.5 hrs
Texture	3D point color	3D point color	3D point color	3D point color	UV Texture map
Post-processing for animation	Rigging + learned motion module	Per-avatar learned transform	Per-vertex transform	Learned 3D point transform	Not needed

- 🕒 **Faster optim.**
- 🔧 **Easier to use**
- 👍 **Better looking**

Text-driven 4D human avatar generation

