Warsaw University of Technology[1]
University of British Columbia[2]
Microsoft[3]
Simon Fraser University[4]
Google Brain[5]
IDEAS NCBR[6]
Tooploox[7]

BlendFields: Few-Shot Example-Driven Facial Modeling

Tag: TUE-AM-029, Poster: #39

Kacper Kania[1,2,†] Stephan J. Garbin[3] Andrea Tagliasacchi[4,5,‡] Virginia Estellers[3]
Kwang Moo Yi[2] Julien Valentin[3] Tomasz Trzciński[1,6,7] Marek Kowalski[3]

[†]Work done during an internship at Microsoft Research Cambridge.
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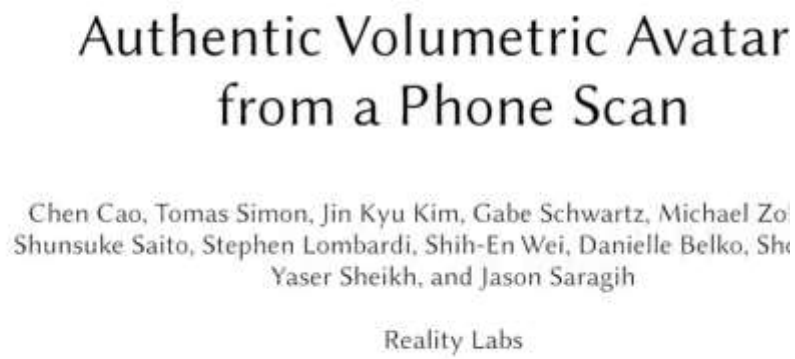
Overview

BlendFields: Few-Shot Example-Driven Facial Modeling

Prior work

[1] Images used: 4000-5000

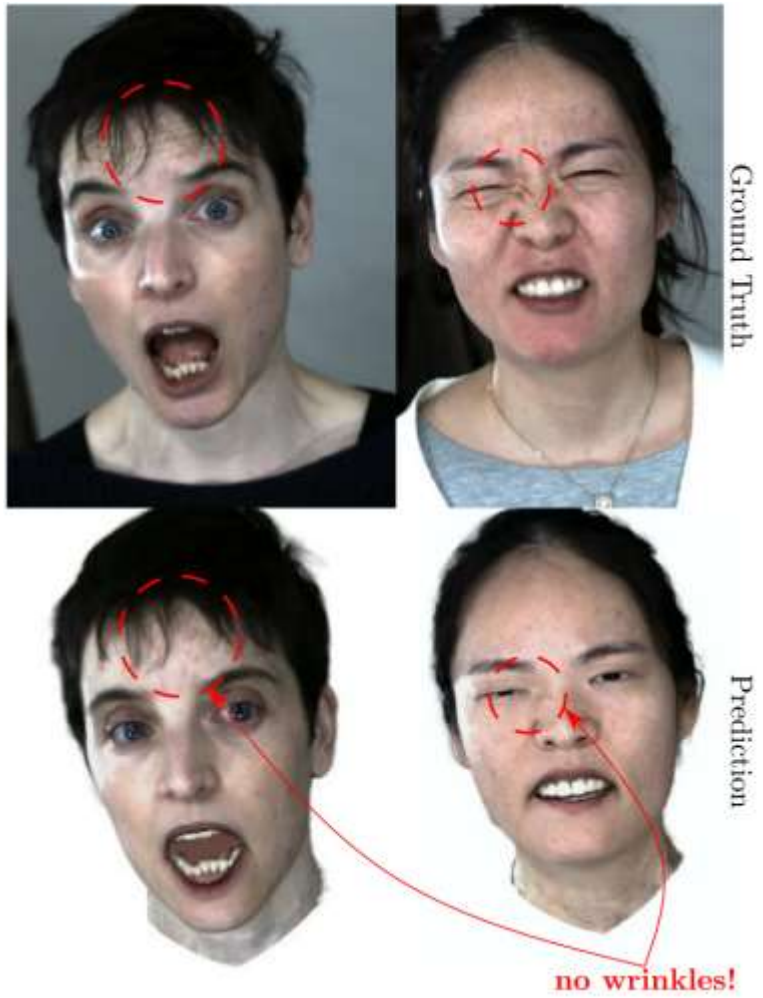


[2] Images used: 3.1 million

[1] Gao, Xuan, et al. "Reconstructing personalized semantic facial nerf models from monocular video." ACM Transactions on Graphics (TOG) 41.6 (2022): 1-12.
[2] Cao, Chen, et al. "Authentic volumetric avatars from a phone scan." ACM Transactions on Graphics (TOG) 41.4 (2022): 1-19.

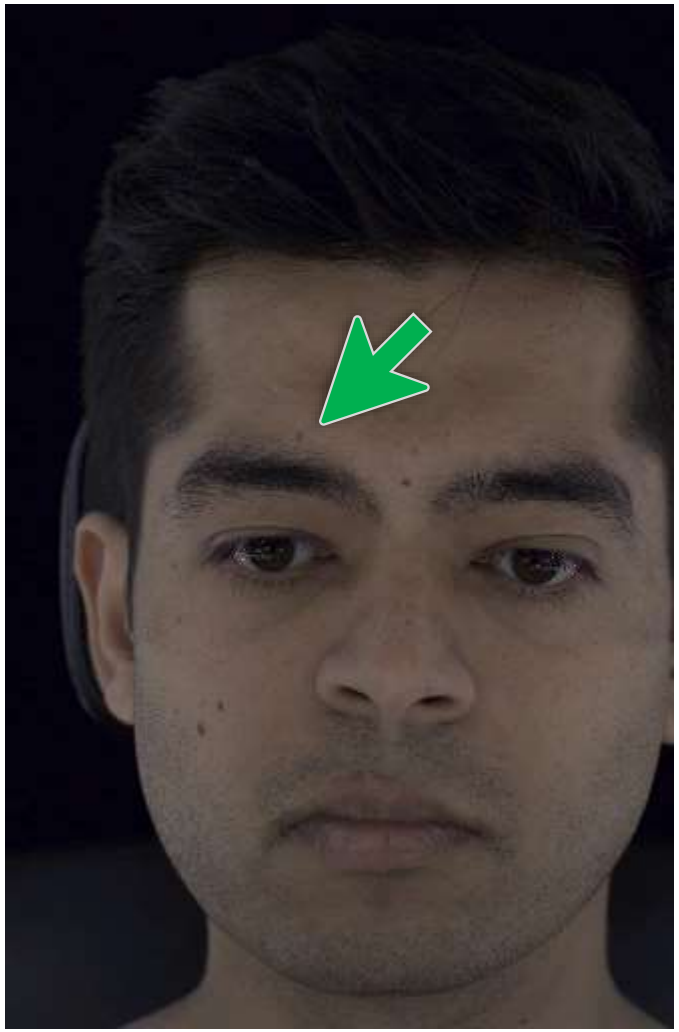
Prior work

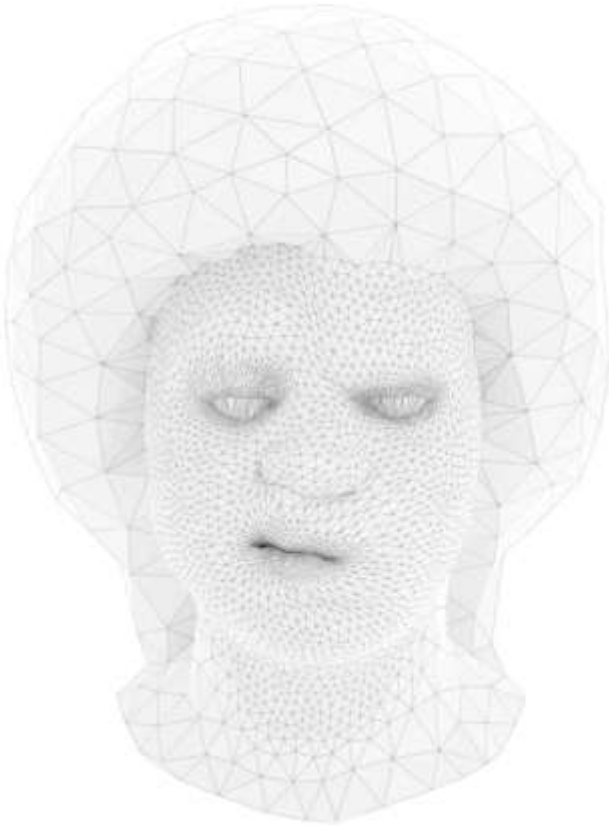
[3] Images used: 29

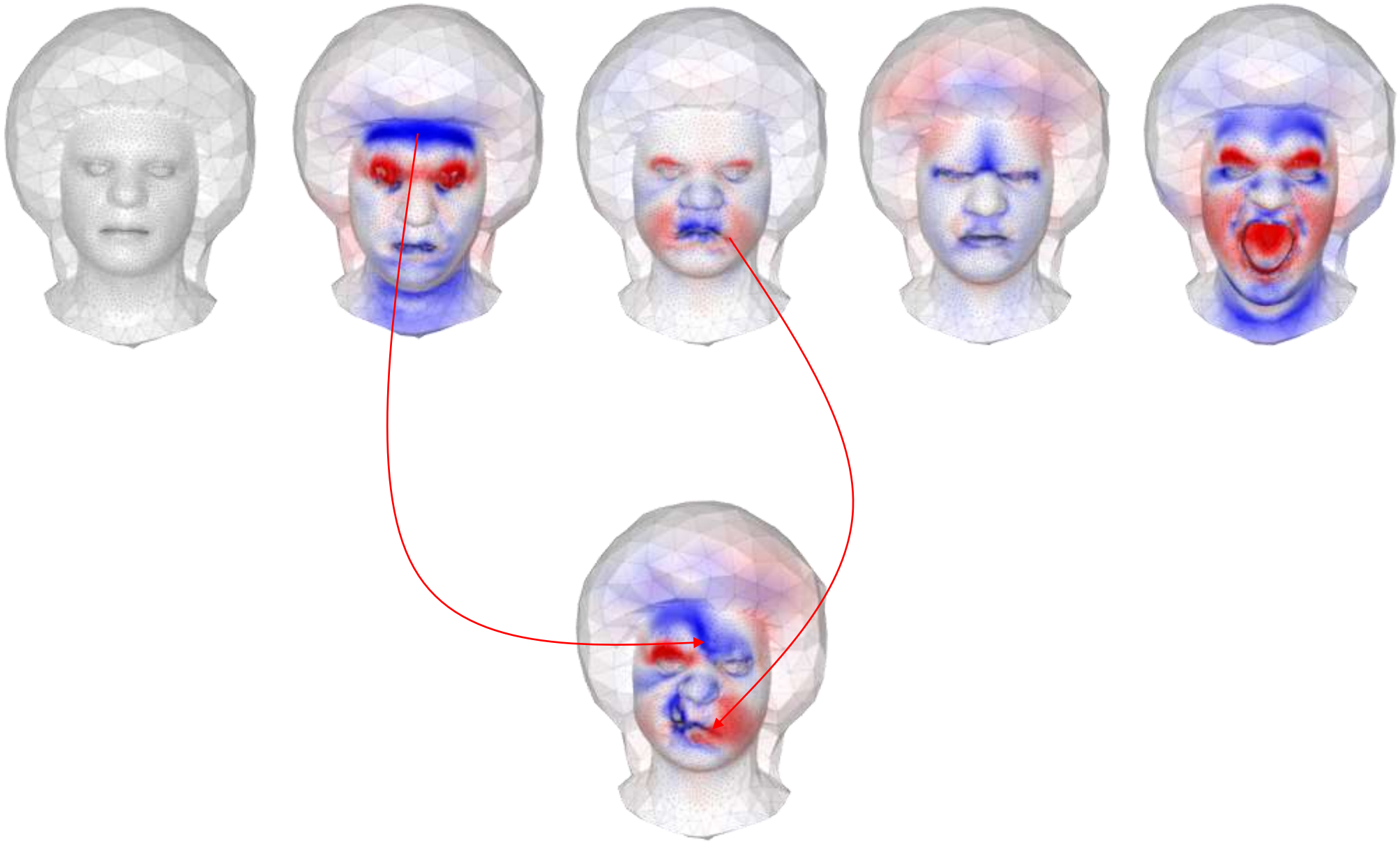


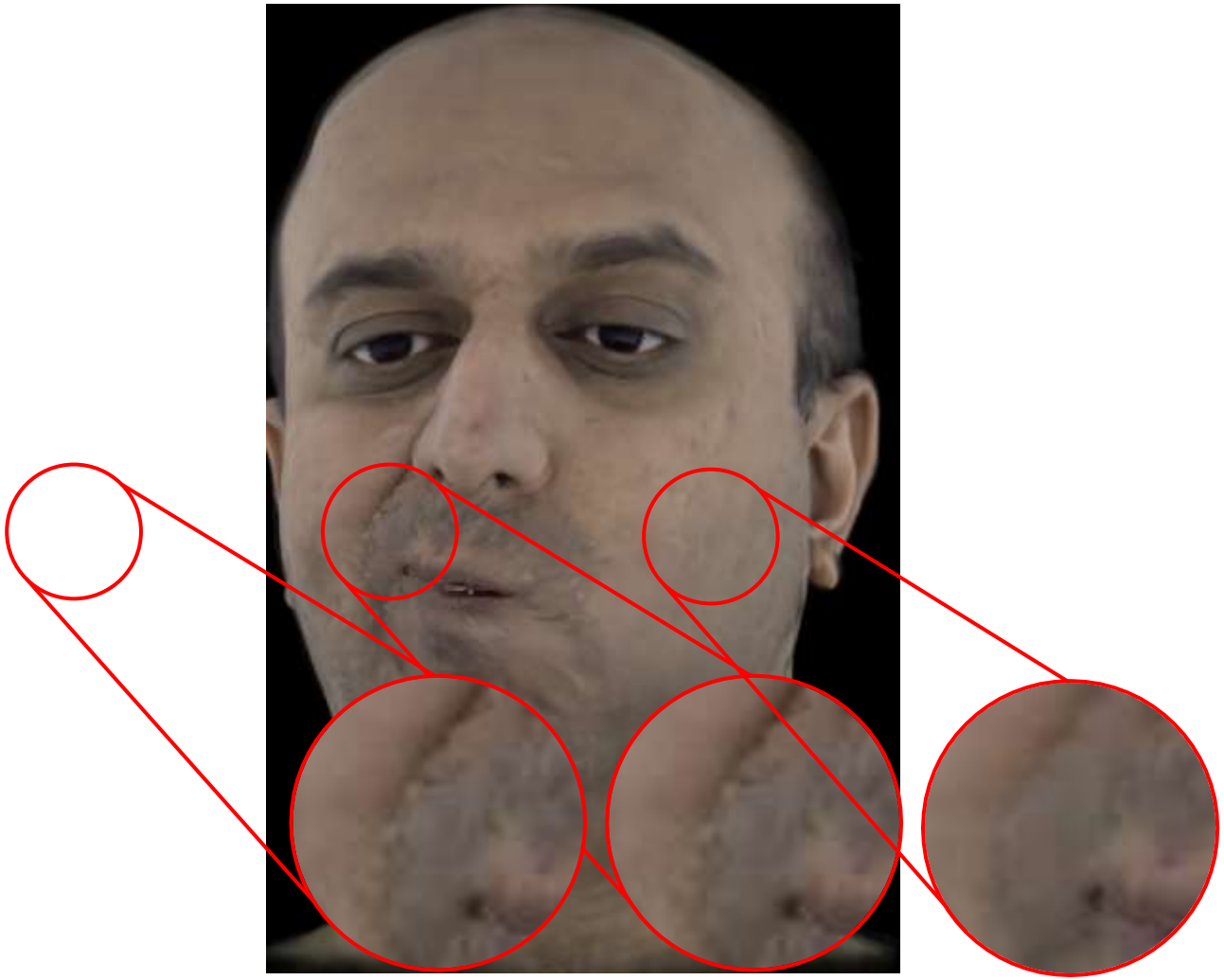
[3] Garbin, Stephan J., et al. "VolTeMorph: Realtime, Controllable and Generalisable Animation of Volumetric Representations." arXiv preprint arXiv:2208.00949 (2022).

Nuts and bolts of BlendFields

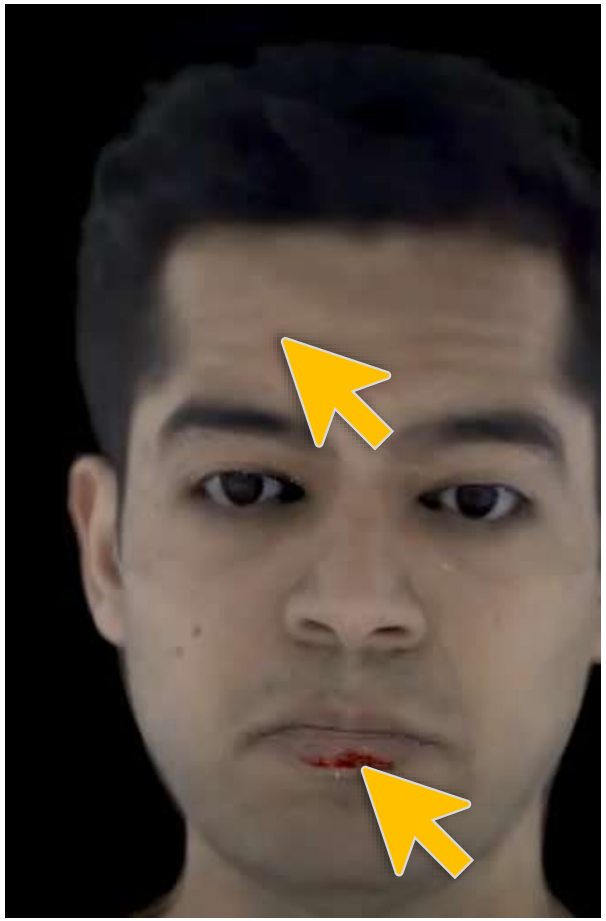






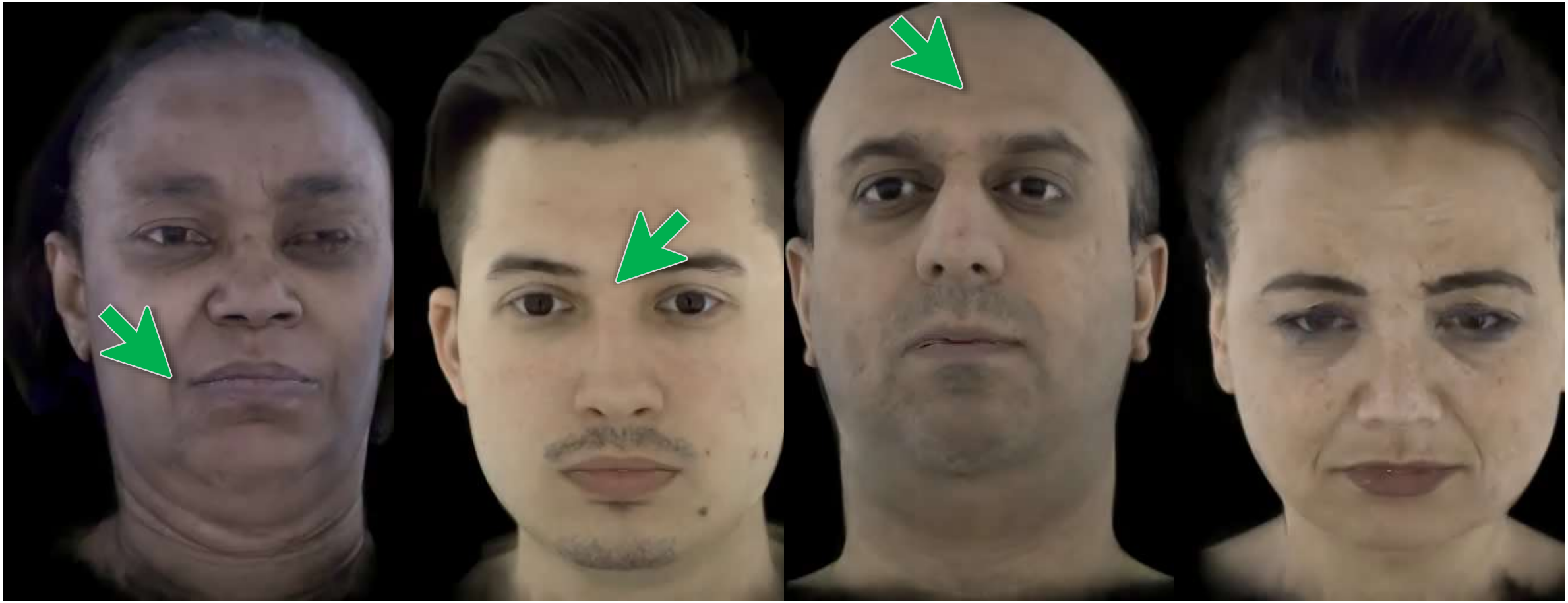


Ours



$\mathrm{VolTeMorph}_{\mathrm{avg}}$

$\mathrm{VolTeMorph}_{1}$



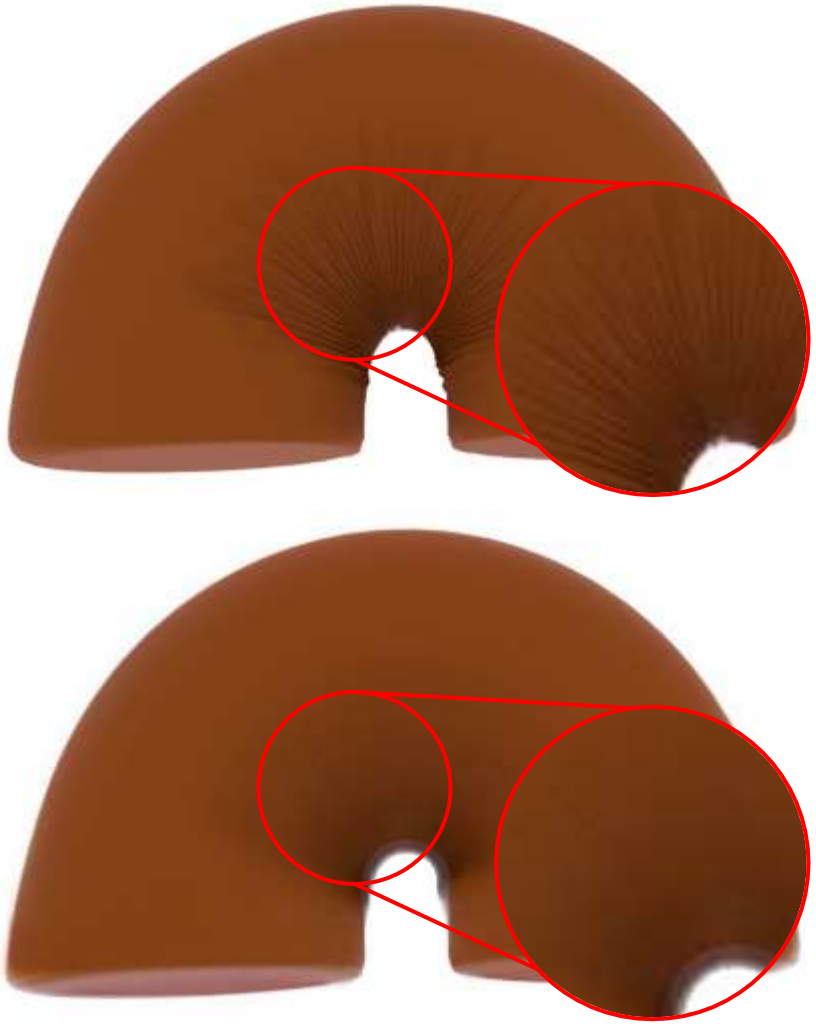
Ground Truth **Ours** VolTeMorph$_{avg}$ VolTeMorph$_{1}$

NeRF Conditioned NeRF NeRFies HyperNeRF-AP HyperNeRF-DS

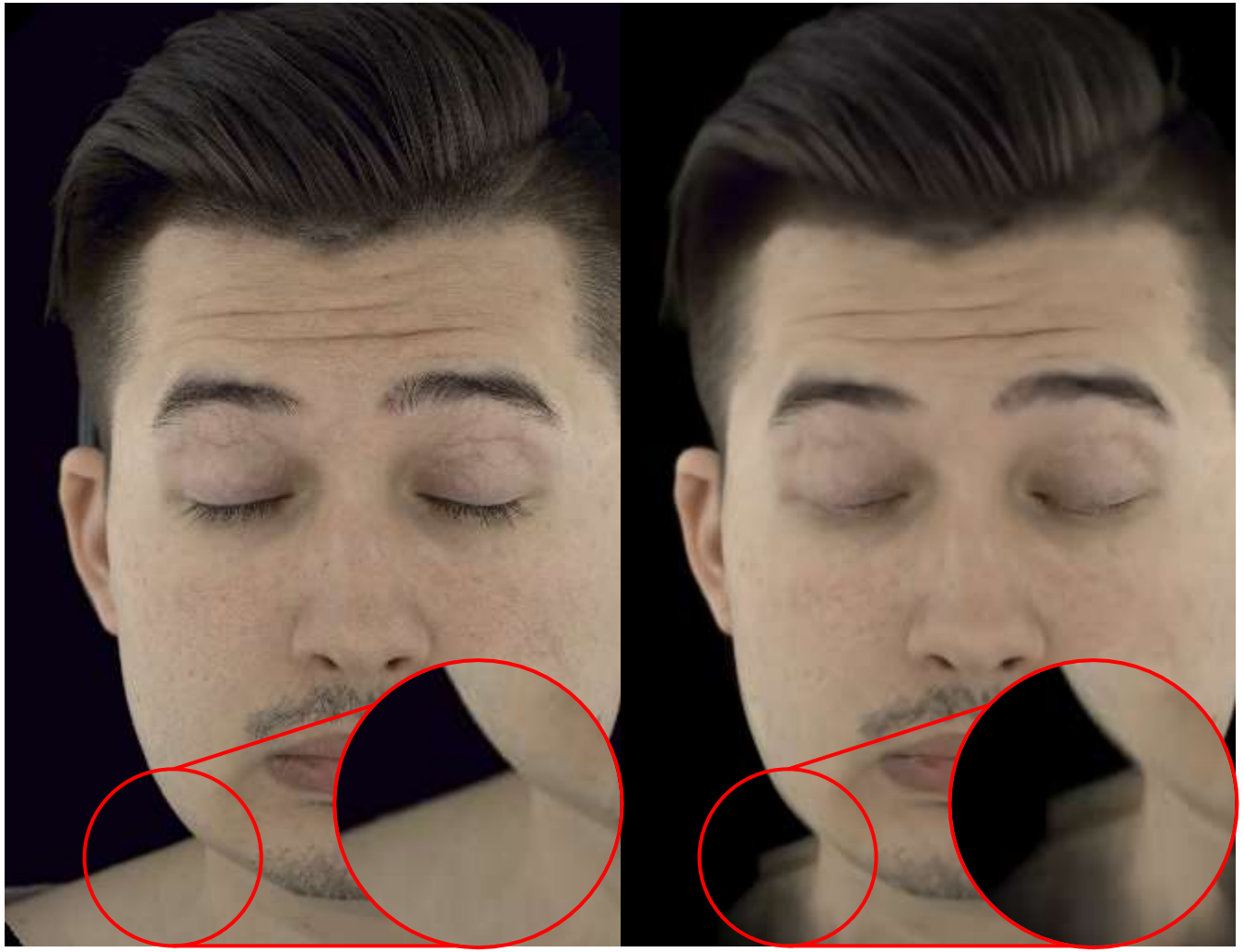
Ground Truth | **Ours** | VolTeMorph$_{\text{avg}}$ | VolTeMorph$_{1}$

Method	Real Data						Synthetic Data		
	Casual Expressions			Novel Pose Synthesis			Novel Pose Synthesis		
	PSNR ↑	SSIM ↑	LPIPS ↓	PSNR ↑	SSIM ↑	LPIPS ↓	PSNR ↑	SSIM ↑	LPIPS ↓
NeRF [36]	23.6465	0.7384	0.2209	25.6696	0.8127	0.1861	13.7210	0.6868	0.3113
Conditioned NeRF [36]	22.9106	0.7162	0.2029	24.7283	0.7927	0.1682	19.5971	0.8138	0.1545
NeRFies [42]	22.6571	0.7105	0.2271	24.8376	0.7990	0.1884	19.3042	0.8081	0.1591
HyperNeRF-AP [43]	22.6219	0.7087	0.2236	24.7119	0.7931	0.1848	19.3557	0.8132	0.1563
HyperNeRF-DS [43]	22.9299	0.7182	0.2241	24.9909	0.8007	0.1860	19.4637	0.8159	0.1526
VolTeMorph$_1$ [15]	24.9939	0.8358	0.1164	26.7526	0.8749	0.0954	26.7033	0.9500	0.0394
VolTeMorph$_{avg}$ [15]	26.9209	0.8912	0.1105	28.6866	0.9176	0.0982	30.2107	0.9815	0.0387
BlendFields	27.5977	0.9056	0.0854	29.7372	0.9311	0.0782	32.7949	0.9882	0.0221

Limitations



Low contrast



Inaccurate face tracker

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