Supplementary material

How much does input data type impact final face model accuracy?

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Part 1: Additional faces - figure 1

- Additional faces are provided as evidence that the trends shown in figure 1 are similar on all faces in our dataset.
- The reconstructed 3D mesh files are available for download as PLY.

Part 2: Additional data types - figure 2

- Additional data types and combinations of data types are shown as CDF curves.

Part 3 : Additional noise distributions - figure 3

- The effect of noise is verified at several magnitudes.

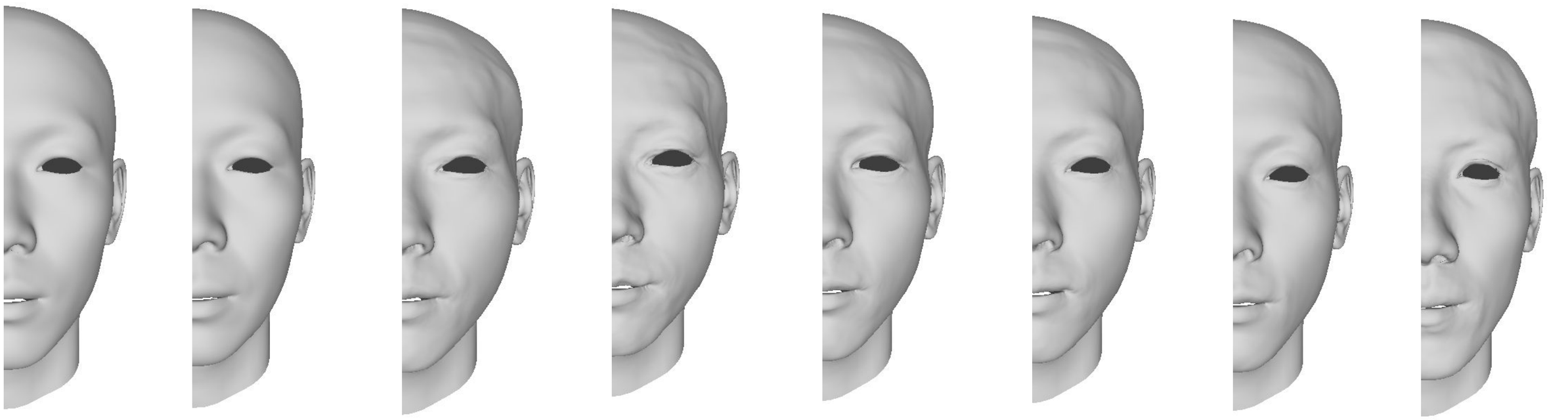
Part 1

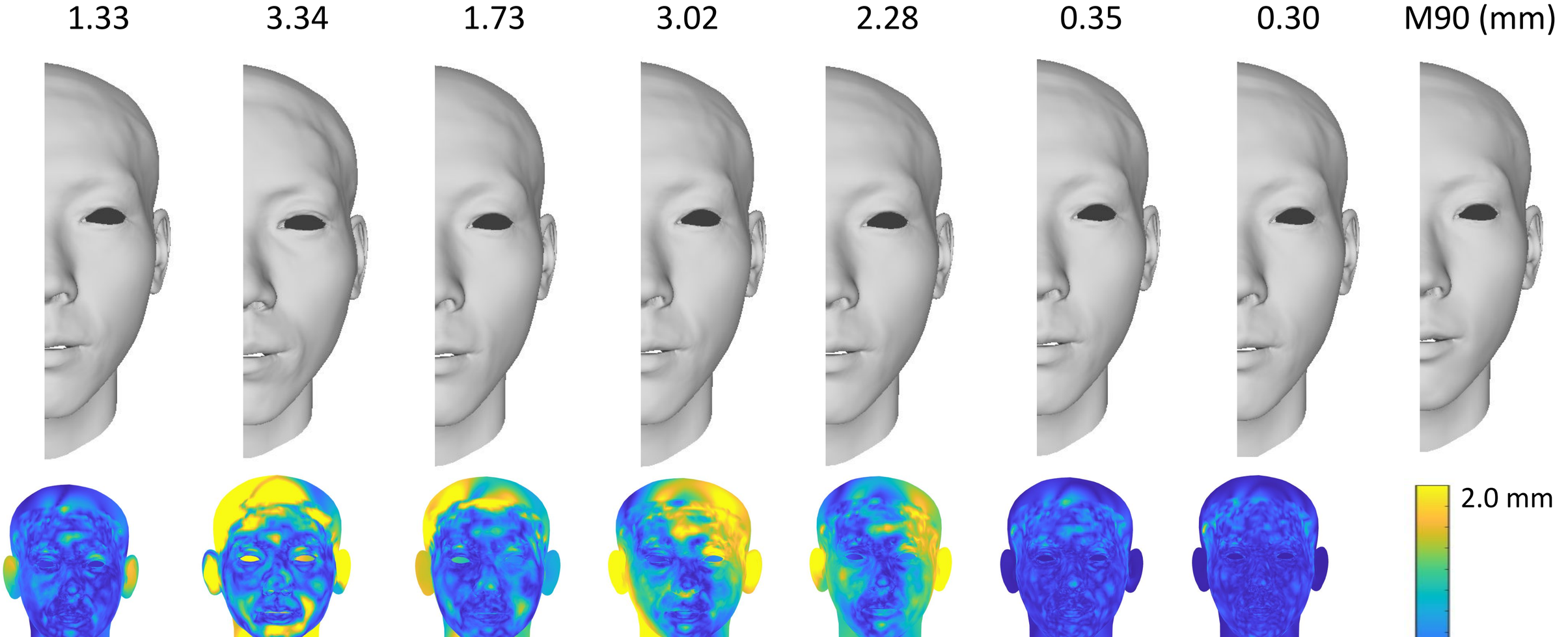
More face examples like figure 1

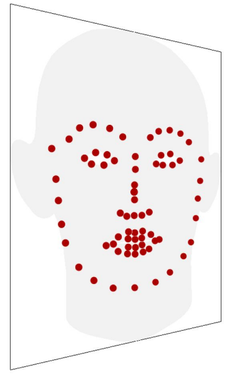
The reconstructed ply files for these examples can be found in a 106MB zip file located at:

https://drive.google.com/file/d/1T5anJqTn35UpAClHO2mAQfJYbQHDLBdS/view?usp=sharing

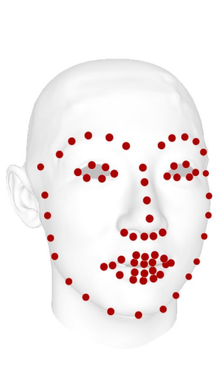
The specific faces shown match the “publishable” set as required by the FaceScape license.

	Landmark 2D	Landmark 3D	Dense 2D	Low-res 3D	Missing Eyes	Missing Mouth	Normal Only	Texture Only
Average	3.13	2.57	1.45	0.31	0.89	0.68	1.77	3.70
	5.71	5.42	3.37	0.84	1.79	1.38	3.24	7.09
Face#421								
MAE (mm)	2.52	2.04	1.45	0.23	0.90	0.60	1.73	3.66
M90 (mm)	4.43	4.02	2.94	0.61	1.72	1.08	3.69	8.31

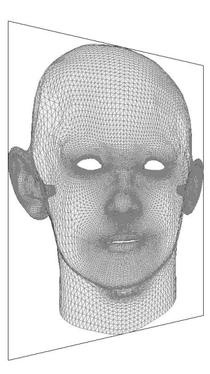
	Landmark3D + Dense 2D	Landmark3D + Texture	Landmark3D + Normal	Dense 2D + Texture	Dense 2D + Normal	Two-view Dense 2D	Full 3D	Ground Truth
Average	0.59	1.50	0.86	1.40	1.05	0.15	0.12	MAE (mm)
	1.33	3.34	1.73	3.02	2.28	0.35	0.30	M90 (mm)
Face#421								
MAE (mm)	0.65	1.73	0.80	1.83	1.18	0.13	0.10	2.0 mm
M90 (mm)	1.48	4.03	1.56	2.39	1.83	0.30	0.25	0.0 mm



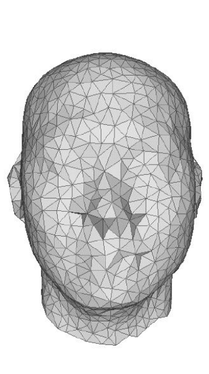
Landmark 2D



Landmark 3D



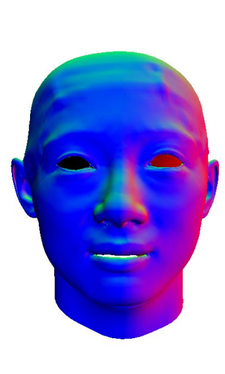
Dense 2D



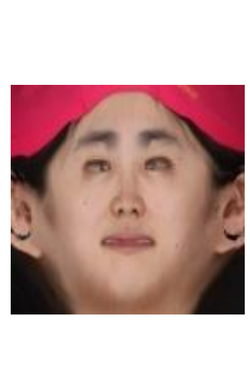
Low-res 3D

Missing Eyes

Missing Mouth



Normal Only

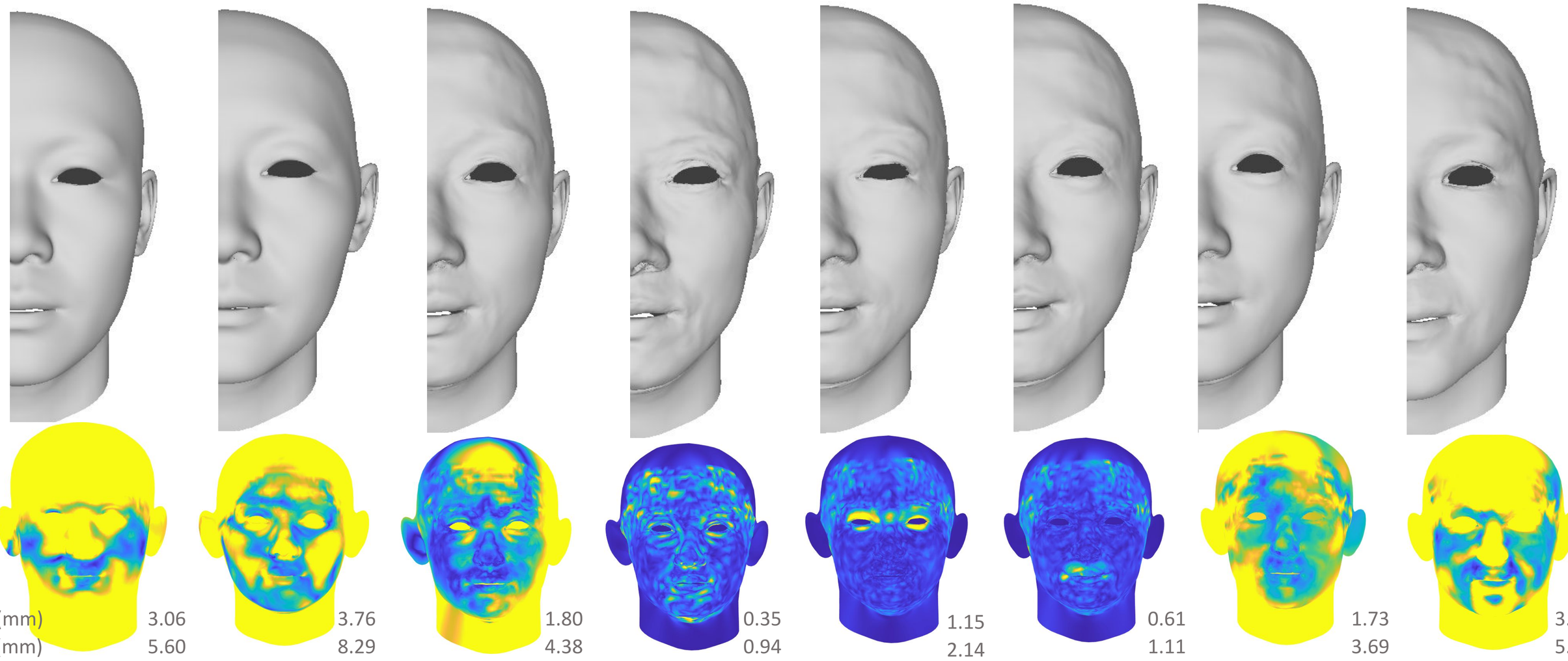


Texture Only

Average

Landmark 2D	Landmark 3D	Dense 2D	Low-res 3D	Missing Eyes	Missing Mouth	Normal Only	Texture Only
3.13	2.57	1.45	0.31	0.89	0.68	1.77	3.70
5.71	5.42	3.37	0.84	1.79	1.38	3.24	7.09

Face#122

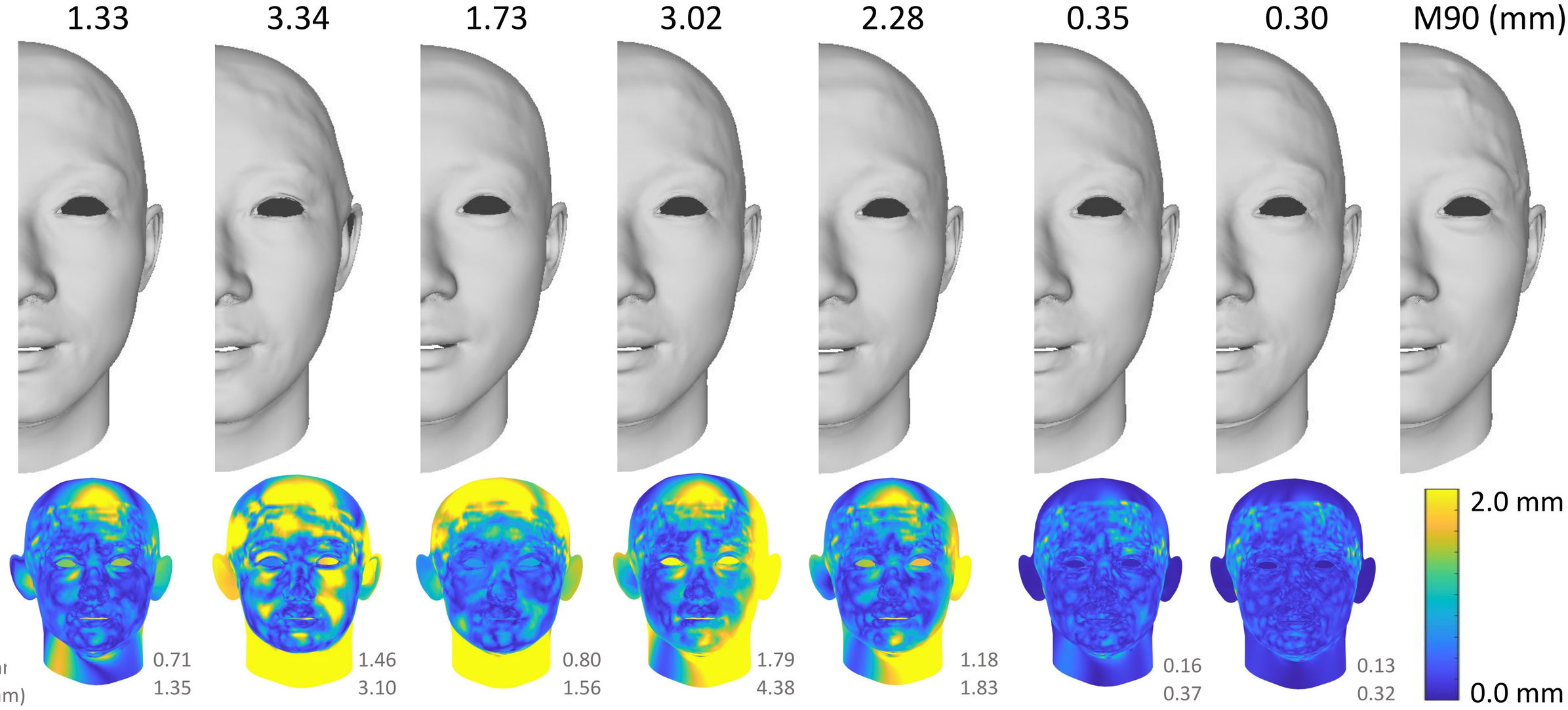


MAE (mm)	3.06	3.76	1.80	0.35	1.15	0.61	1.73	3.14
M90 (mm)	5.60	8.29	4.38	0.94	2.14	1.11	3.69	5.58

Landmark3D + Dense 2D	Landmark3D + Texture	Landmark3D + Normal	Dense 2D + Texture	Dense 2D + Normal	Two-view Dense 2D	Full 3D	Ground Truth
0.59	1.50	0.86	1.40	1.05	0.15	0.12	MAE (mm)
1.33	3.34	1.73	3.02	2.28	0.35	0.30	M90 (mm)

Average

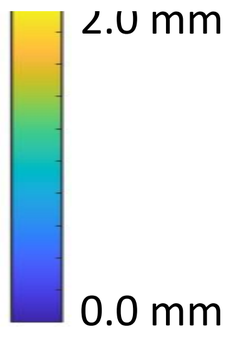
Face#122



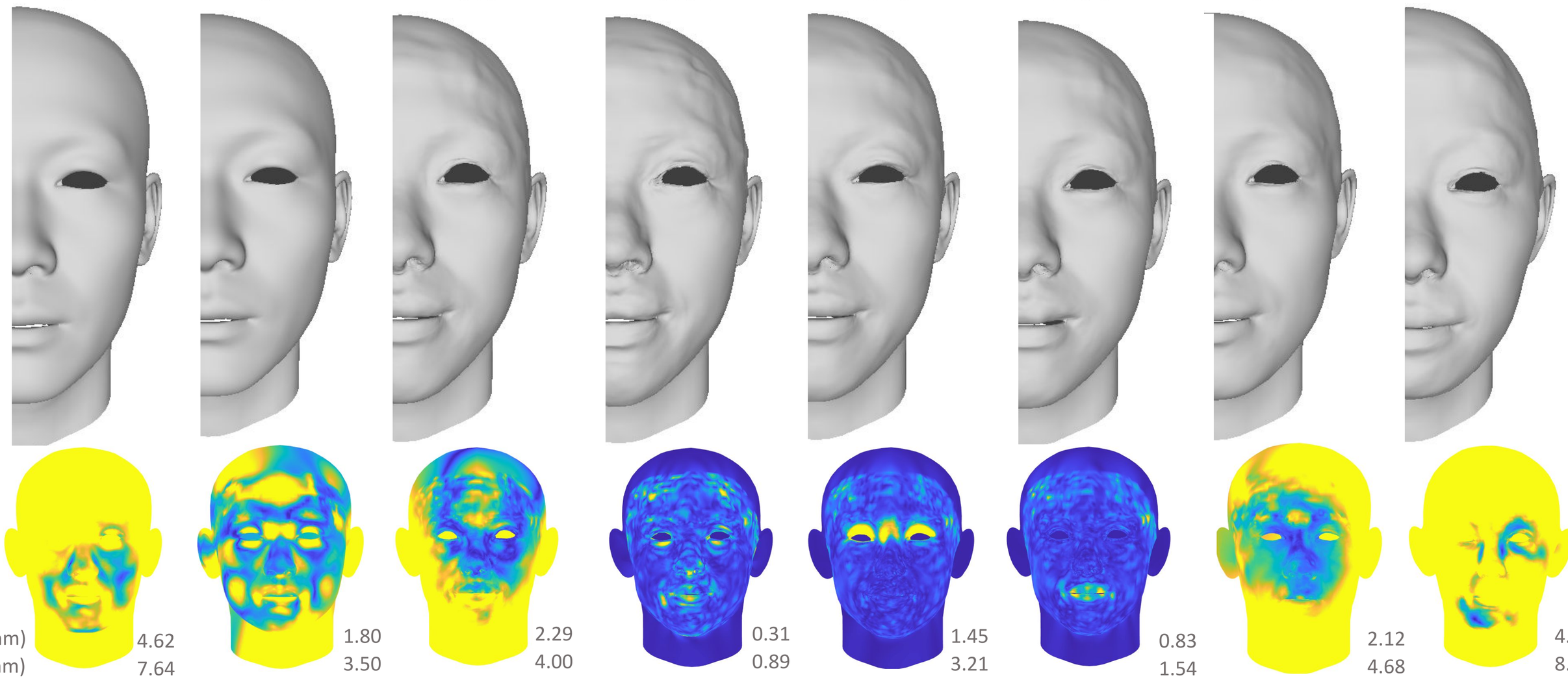
MAE (mm)	0.71	1.46	0.80	1.79	1.18	0.16	0.13	
M90 (mm)	1.35	3.10	1.56	4.38	1.83	0.37	0.32	

	Landmark 2D	Landmark 3D	Dense 2D	Low-res 3D	Missing Eyes	Missing Mouth	Normal Only	Texture Only
Average	3.13	2.57	1.45	0.31	0.89	0.68	1.77	3.70
	5.71	5.42	3.37	0.84	1.79	1.38	3.24	7.09
Face#212								
MAE (mm)	2.65	2.88	0.78	0.23	0.76	0.61	2.12	2.40
M90 (mm)	3.91	6.99	1.40	0.65	1.65	1.13	4.68	4.29

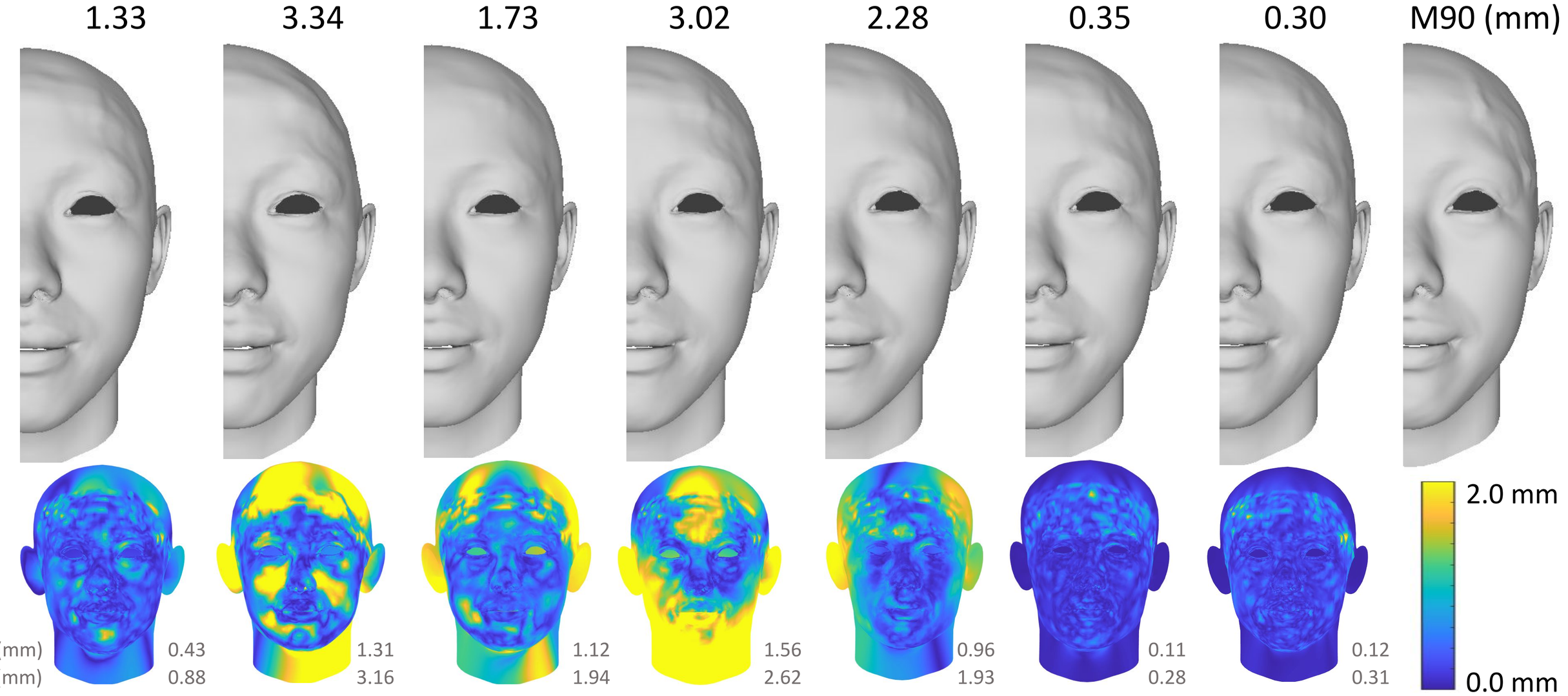
	Landmark3D + Dense 2D	Landmark3D + Texture	Landmark3D + Normal	Dense 2D + Texture	Dense 2D + Normal	Two-view Dense 2D	Full 3D	Ground Truth
Average	0.59	1.50	0.86	1.40	1.05	0.15	0.12	MAE (mm)
	1.33	3.34	1.73	3.02	2.28	0.35	0.30	M90 (mm)
Face#212								
MAE (mm)	0.28	0.87	0.89	0.72	0.96	0.11	0.10	
M90 (mm)	0.59	1.84	1.69	1.29	1.93	0.28	0.24	

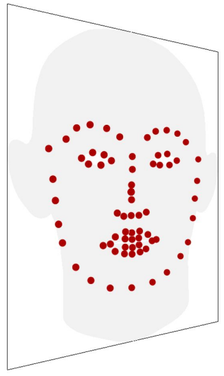


	Landmark 2D	Landmark 3D	Dense 2D	Low-res 3D	Missing Eyes	Missing Mouth	Normal Only	Texture Only
Average	3.13	2.57	1.45	0.31	0.89	0.68	1.77	3.70
	5.71	5.42	3.37	0.84	1.79	1.38	3.24	7.09

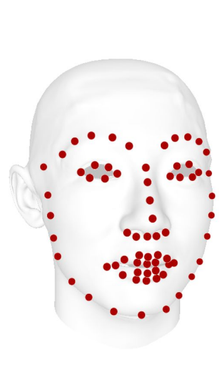


	Landmark3D + Dense 2D	Landmark3D + Texture	Landmark3D + Normal	Dense 2D + Texture	Dense 2D + Normal	Two-view Dense 2D	Full 3D	Ground Truth
Average	0.59	1.50	0.86	1.40	1.05	0.15	0.12	MAE (mm)
	1.33	3.34	1.73	3.02	2.28	0.35	0.30	M90 (mm)

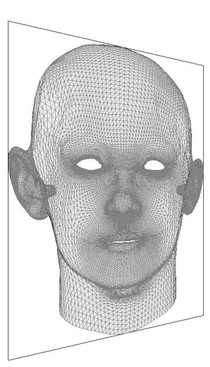




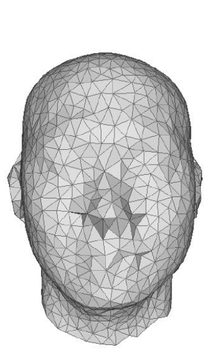
Landmark 2D



Landmark 3D

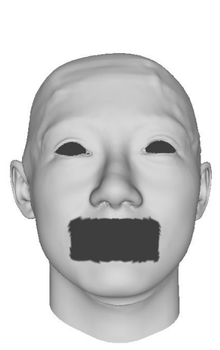


Dense 2D



Low-res 3D

Missing Eyes



Missing Mouth

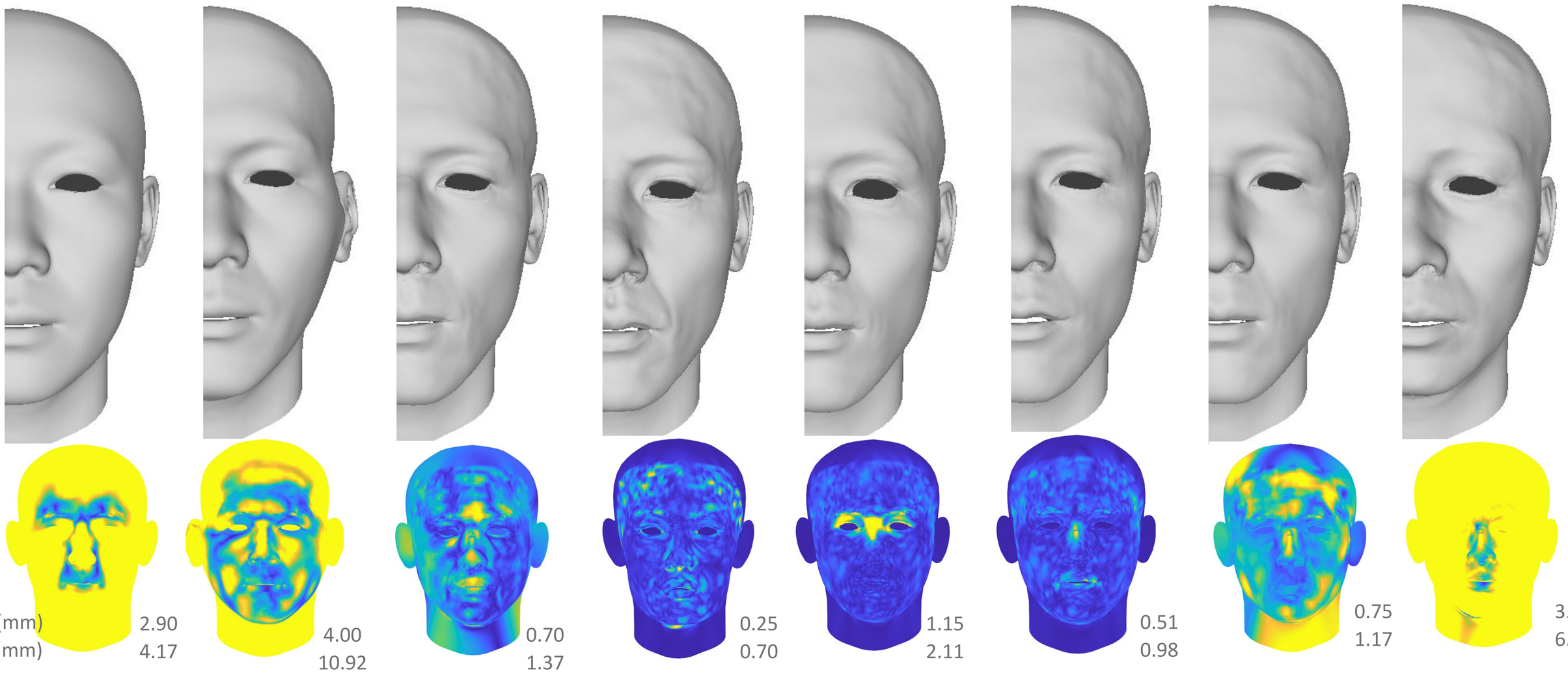
Normal Only

Texture Only

Average

Landmark 2D	Landmark 3D	Dense 2D	Low-res 3D	Missing Eyes	Missing Mouth	Normal Only	Texture Only
3.13	2.57	1.45	0.31	0.89	0.68	1.77	3.70
5.71	5.42	3.37	0.84	1.79	1.38	3.24	7.09

Face#393

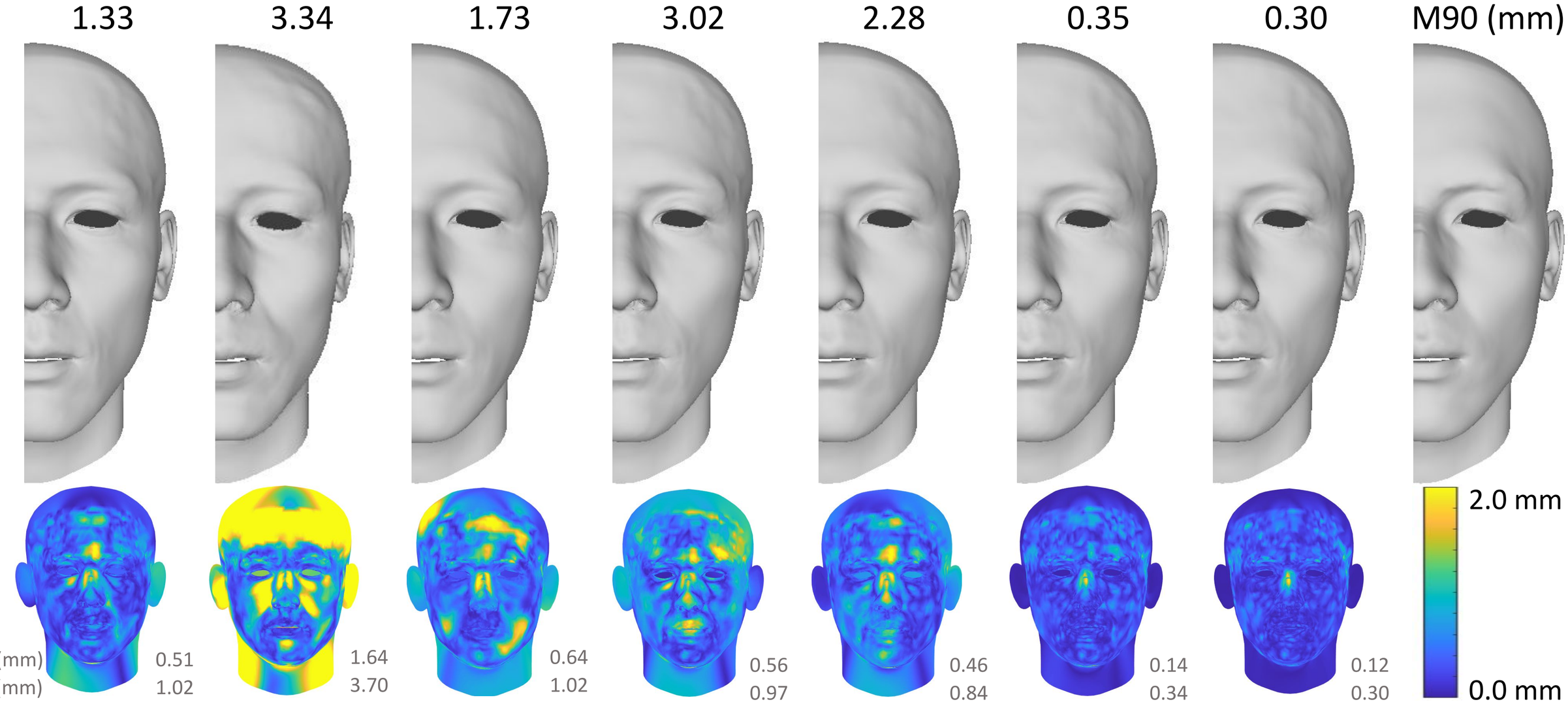


MAE (mm) 2.90 4.00 0.70 0.25 1.15 0.51 0.75 3.85
M90 (mm) 4.17 10.92 1.37 0.70 2.11 0.98 1.17 6.34

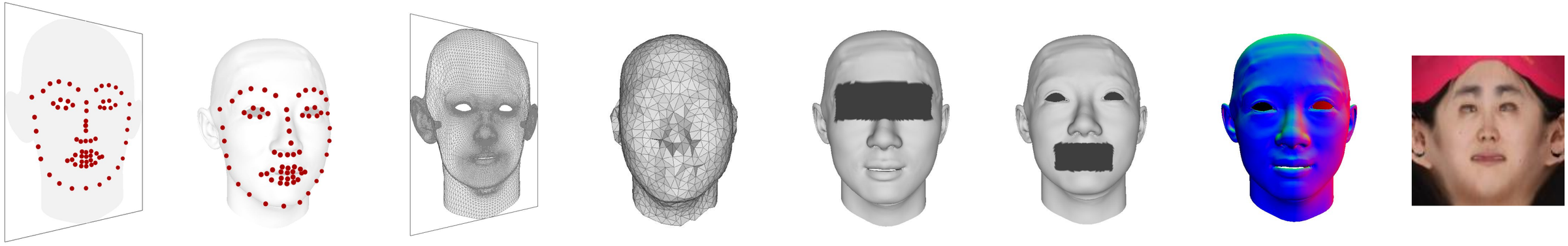
Landmark3D + Dense 2D	Landmark3D + Texture	Landmark3D + Normal	Dense 2D + Texture	Dense 2D + Normal	Two-view Dense 2D	Full 3D	Ground Truth
0.59	1.50	0.86	1.40	1.05	0.15	0.12	MAE (mm)
1.33	3.34	1.73	3.02	2.28	0.35	0.30	M90 (mm)

Average

Face#393

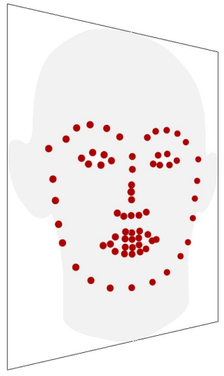


MAE (mm) 0.51 1.64 0.64 0.56 0.46 0.14 0.12
M90 (mm) 1.02 3.70 1.02 0.97 0.84 0.34 0.30

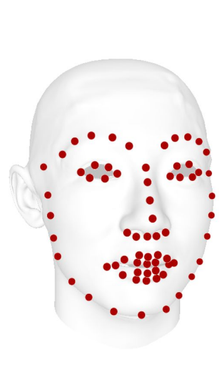


	Landmark 2D	Landmark 3D	Dense 2D	Low-res 3D	Missing Eyes	Missing Mouth	Normal Only	Texture Only
Average	3.13	2.57	1.45	0.31	0.89	0.68	1.77	3.70
	5.71	5.42	3.37	0.84	1.79	1.38	3.24	7.09
Face#395								
MAE (mm)	3.85	2.55	1.40	0.24	0.60	0.44	2.30	4.61
M90 (mm)	5.62	6.15	3.08	0.65	1.14	0.84	3.30	8.75

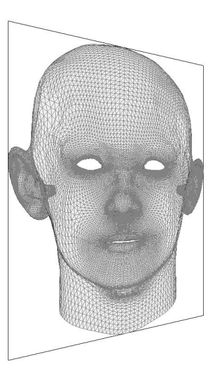
	Landmark3D + Dense 2D	Landmark3D + Texture	Landmark3D + Normal	Dense 2D + Texture	Dense 2D + Normal	Two-view Dense 2D	Full 3D	Ground Truth
Average	0.59	1.50	0.86	1.40	1.05	0.15	0.12	MAE (mm)
	1.33	3.34	1.73	3.02	2.28	0.35	0.30	M90 (mm)
Face#395								
MAE (mm)	0.64	1.97	0.76	1.40	1.06	0.13	0.11	
M90 (mm)	1.78	4.74	1.31	3.19	2.33	0.31	0.27	



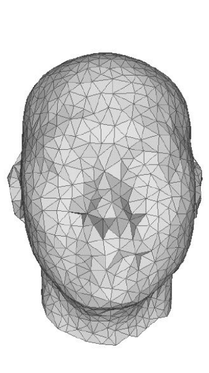
Landmark 2D



Landmark 3D



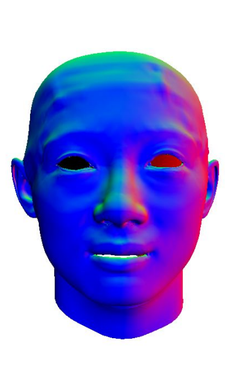
Dense 2D



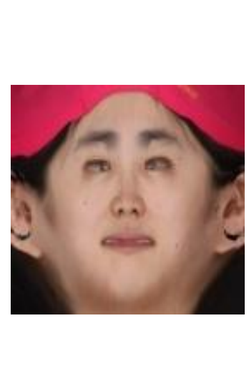
Low-res 3D

Missing Eyes

Missing Mouth



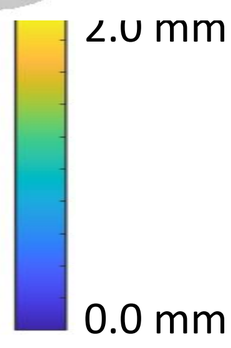
Normal Only

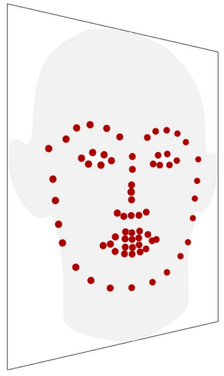


Texture Only

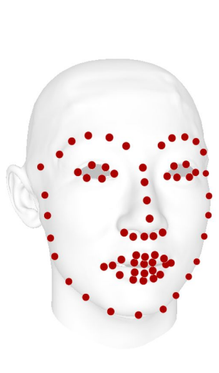
	Landmark 2D	Landmark 3D	Dense 2D	Low-res 3D	Missing Eyes	Missing Mouth	Normal Only	Texture Only
Average	3.13	2.57	1.45	0.31	0.89	0.68	1.77	3.70
	5.71	5.42	3.37	0.84	1.79	1.38	3.24	7.09
Face#527								
MAE (mm)	3.02	1.57	1.39	0.26	0.72	0.74	1.96	3.52
M90 (mm)	4.70	2.64	3.34	0.71	1.74	1.43	2.92	7.17

	Landmark3D + Dense 2D	Landmark3D + Texture	Landmark3D + Normal	Dense 2D + Texture	Dense 2D + Normal	Two-view Dense 2D	Full 3D	Ground Truth
Average	0.59	1.50	0.86	1.40	1.05	0.15	0.12	MAE (mm)
	1.33	3.34	1.73	3.02	2.28	0.35	0.30	M90 (mm)
Face#527								
MAE (mm)	0.47	1.30	0.69	1.10	0.89	0.13	0.11	
M90 (mm)	1.17	2.52	1.27	2.48	1.74	0.31	0.27	

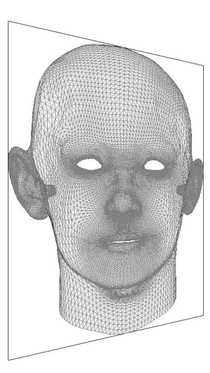




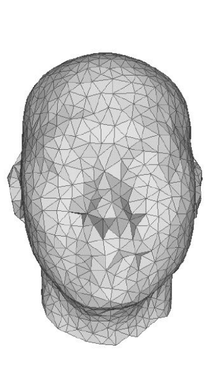
Landmark 2D



Landmark 3D



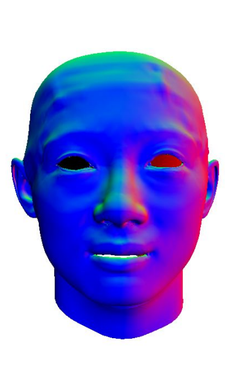
Dense 2D



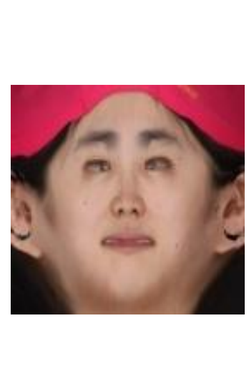
Low-res 3D

Missing Eyes

Missing Mouth



Normal Only

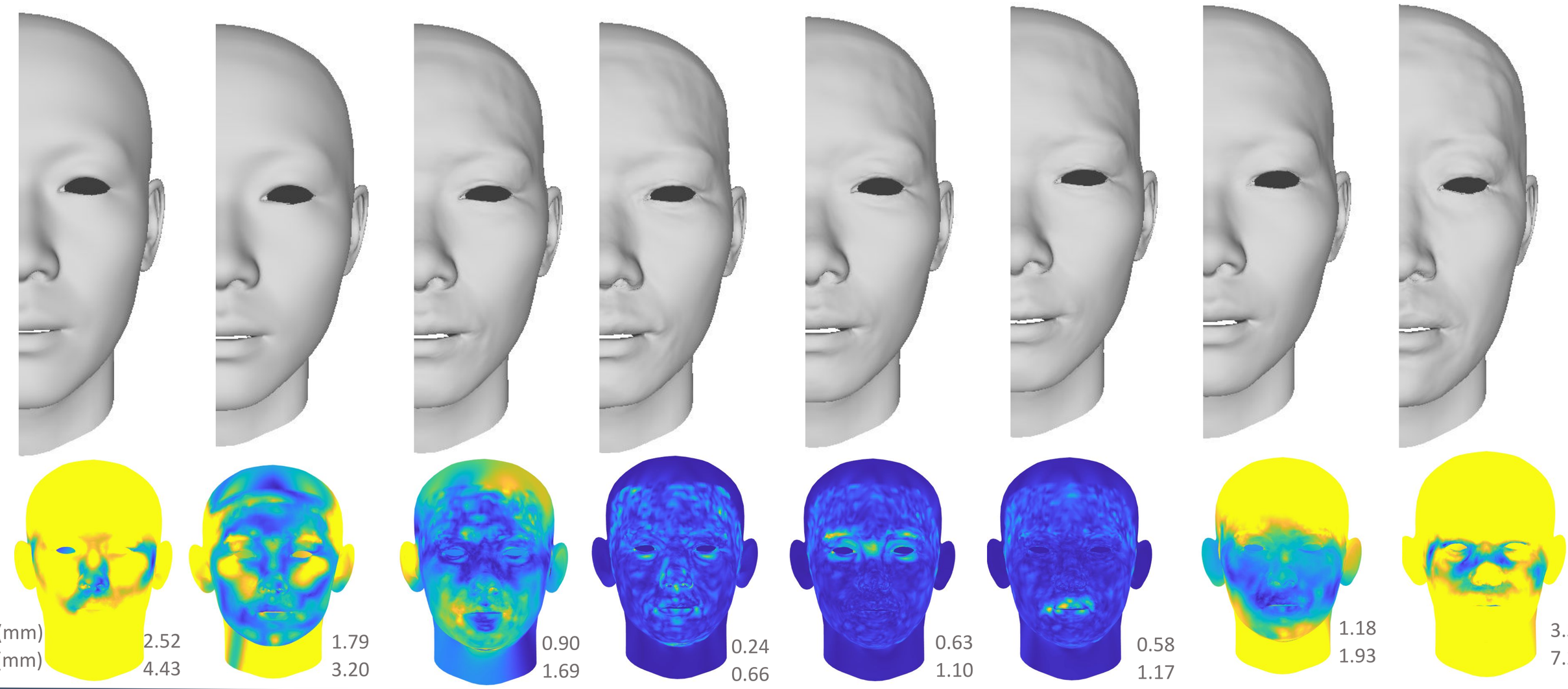


Texture Only

Average

Landmark 2D	Landmark 3D	Dense 2D	Low-res 3D	Missing Eyes	Missing Mouth	Normal Only	Texture Only
3.13	2.57	1.45	0.31	0.89	0.68	1.77	3.70
5.71	5.42	3.37	0.84	1.79	1.38	3.24	7.09

Face#610



MAE (mm) 2.52 1.79 0.90 0.24 0.63 0.58 1.18 3.58

M90 (mm) 4.43 3.20 1.69 0.66 1.10 1.17 1.93 7.26

Landmark3D + Dense 2D	Landmark3D + Texture	Landmark3D + Normal	Dense 2D + Texture	Dense 2D + Normal	Two-view Dense 2D	Full 3D	Ground Truth
0.59	1.50	0.86	1.40	1.05	0.15	0.12	MAE (mm)
1.33	3.34	1.73	3.02	2.28	0.35	0.30	M90 (mm)

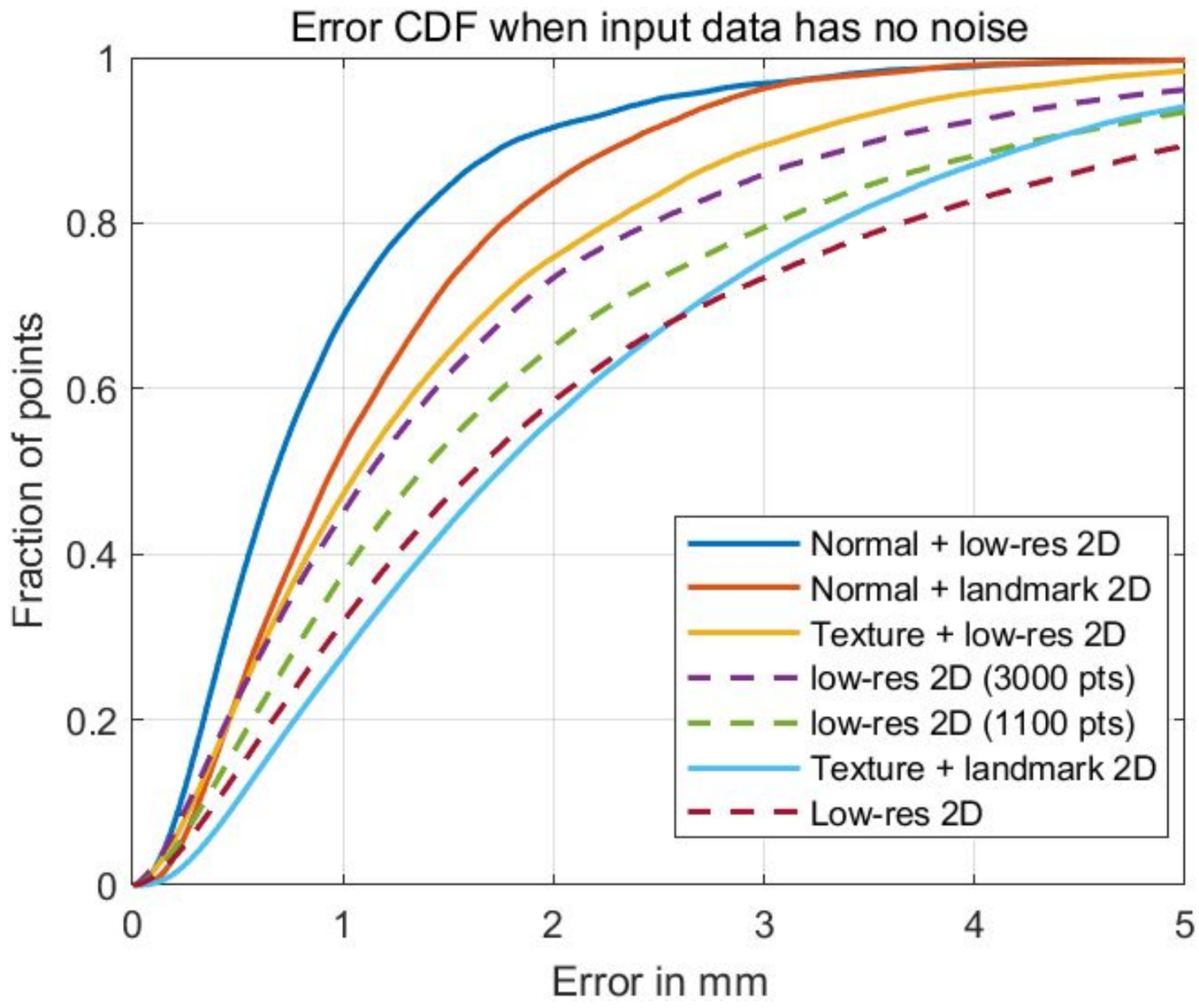
Average

Face#610

Part 2

Additional input data types

Part 2: Additional input data types



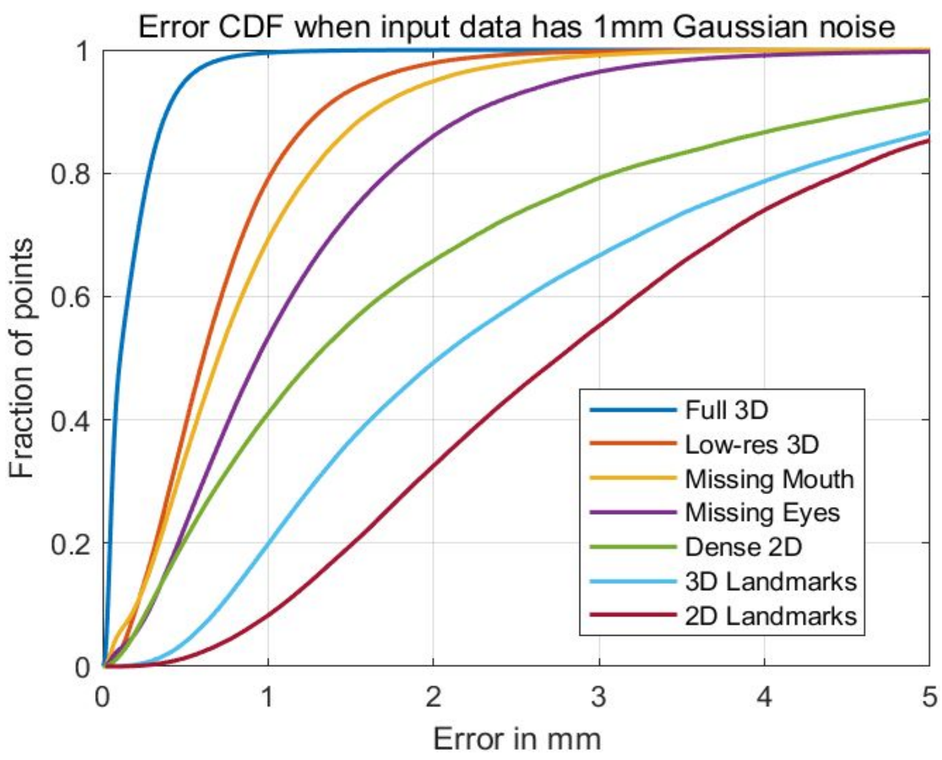
Cumulative error distribution, showing the fraction of reconstructed vertices with error less than a given threshold. This plot contain extra input data types not shown in Figure 2. Note that the ‘low-res 2D’ data type has 800 2D points, while ‘low-res 2D (1100 pts)’ and ‘low-res 2D (3000 pts)’ have correspondingly 1100 and 3000 points. These are similar to ‘Dense2D’, just with many fewer points, analogous to the LowRes3D datatype’s reduction from Full3D.

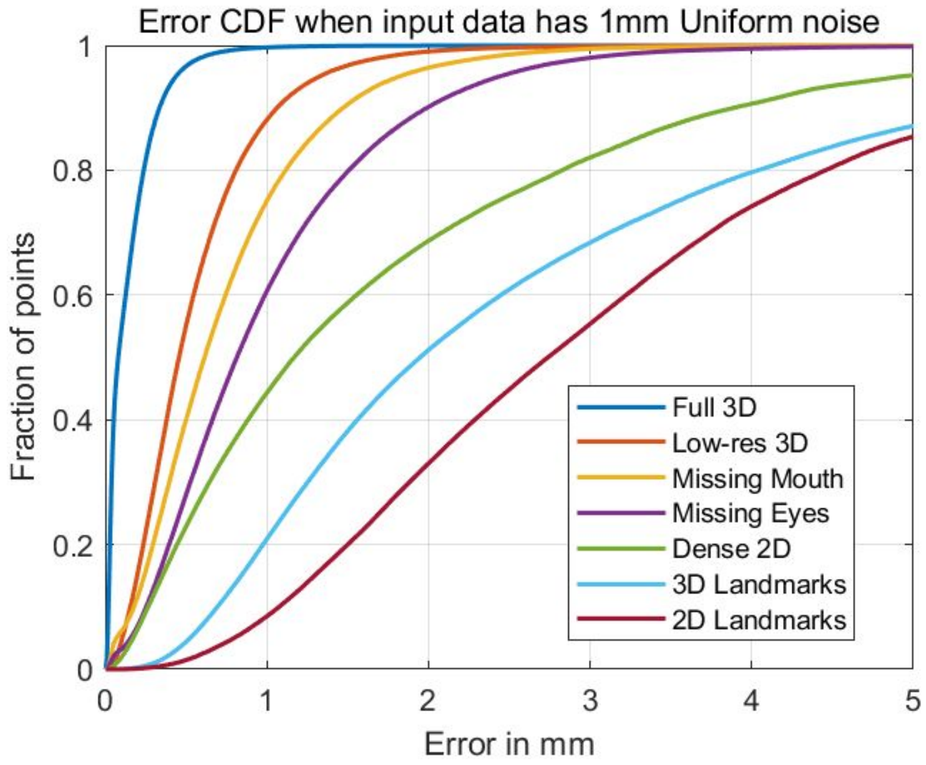
As discussed in the main paper, combinations do better than single 2D datatypes, so it is important to use all the information. These options all have max error (M90) above 2mm, consistent with the combinations reported in the main paper.

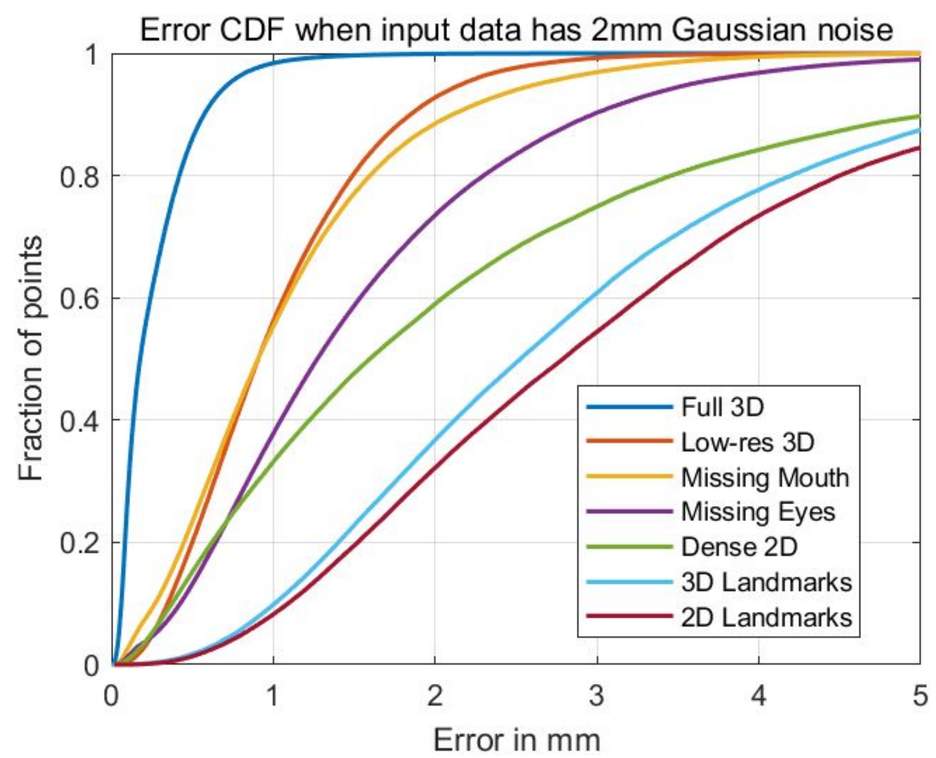
Part 3

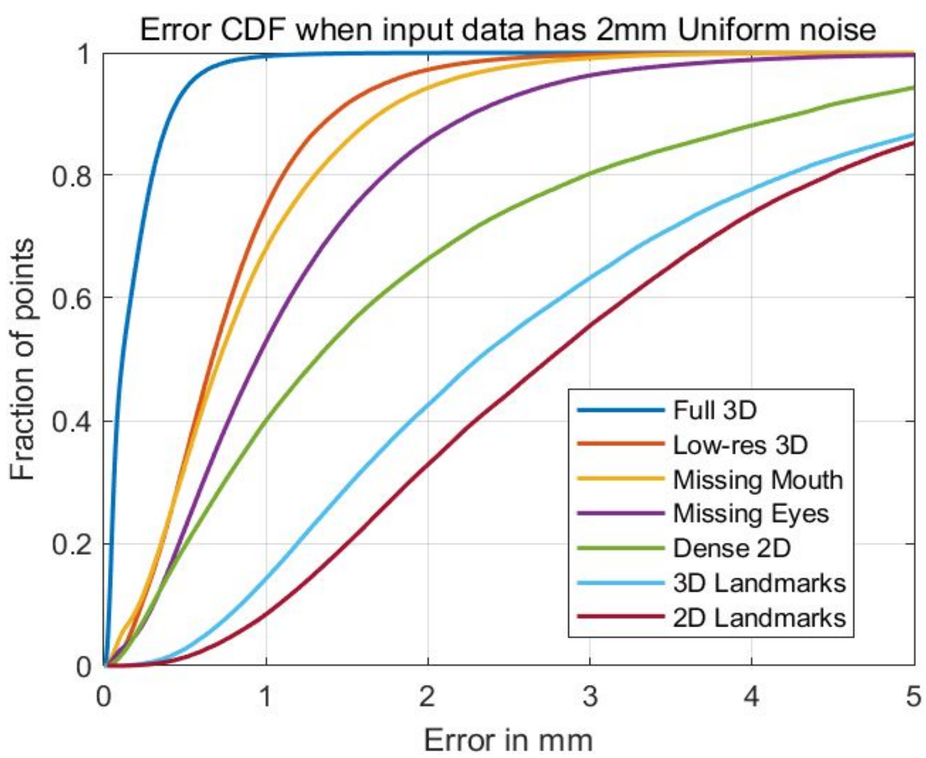
More noise examples like figure 3

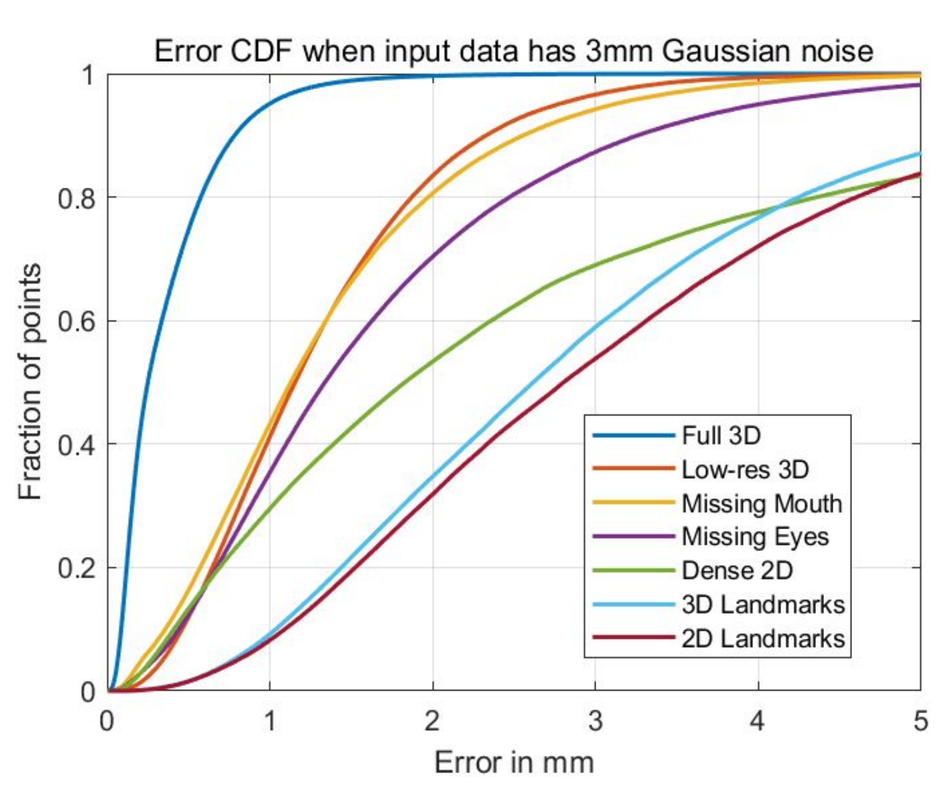
Part 3: More noise distributions and magnitudes

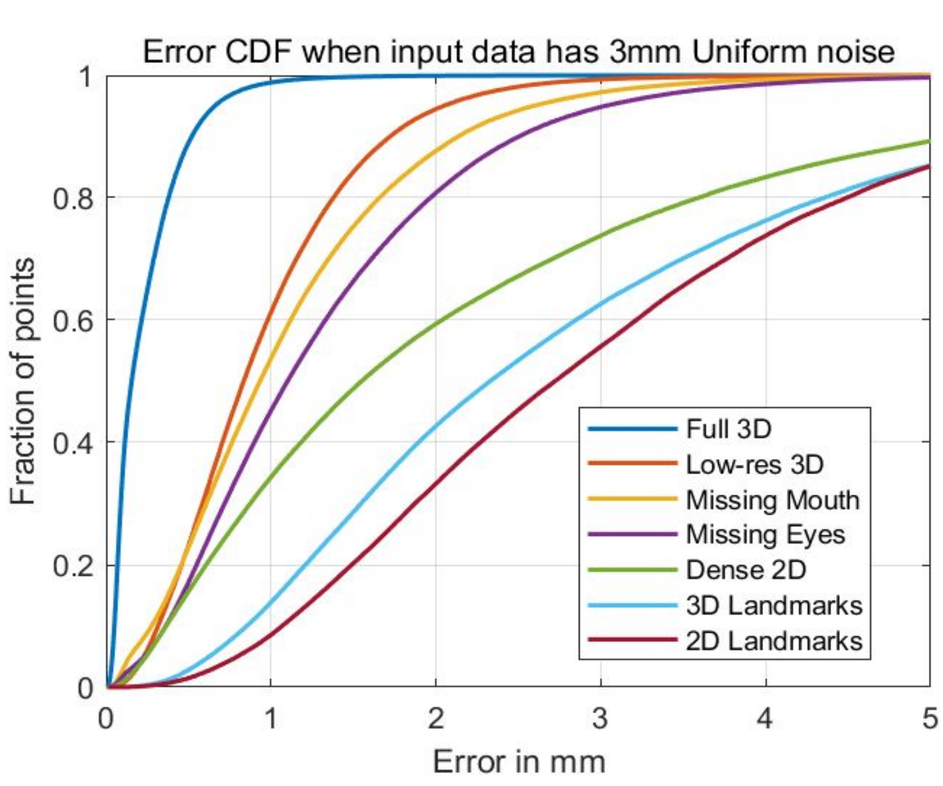












Cumulative error distribution when input has different kinds of noise added, showing the fraction of reconstructed vertices with less than a given threshold error. The overall relationship between data types is the same as in the no noise analysis.