





## Task & Motivation

Solored meshes, defined by () shape + M color, are dominant 3D formats in many applications (eg, VR, gaming, etc).











We aim to assess the visual quality of a mesh under real-world distortions (eg, in compression, transmission).

# Key Insights

X Mesh operations bring geometry & texture distortions. Observation: geometry and texture interact in complex ways that determine the visual quality of 3D meshes.



X Existing works ignore such interaction and assess on either geometry (model-based) or texture (projection-based).

### **Our Solution**

A hybrid method that combines model- and projection-based approaches and explores the geometry-texture interactions for comprehensive quality understanding.

Method	Nehmé <i>et al</i> . [29]		SJTU-TMQA [7]		TSMD [49]		CMDM [30]	
	SRCC	PLCC	SRCC	PLCC	SRCC	PLCC	SRCC	PLCC
HD [4]	0.107	0.175	0.060	0.140	0.446	0.462	0.189	0.210
MSDM2 [19]	0.335	0.344	0.050	0.120	0.045	0.255	0.415	0.517
FMPD [44]	0.391	0.404	0.156	0.458	0.077	0.218	0.615	0.623
GeodesicPSIM [50]	_	—	—	—	0.820	0.820	_	—
Fu <i>et al</i> . [9]	0.688	0.696	—	—	—	—	—	—
PSNR [45]	0.353	0.375	0.299	0.287	0.714	0.711	0.830	0.839
SSIM [47]	0.210	0.226	0.394	0.289	0.673	0.674	0.852	0.861
VIF [36]	0.538	0.557	0.450	0.422	<u>0.851</u>	<u>0.846</u>	0.827	0.837
LPIPS [54]	0.672	0.676	0.718	0.717	0.710	0.712	0.865	0.918
Graphics-LPIPS [29]	0.722	0.746	0.790	0.762	0.834	0.812	0.859	<u>0.925</u>
3D-PSSIM [20]	0.882	<u>0.842</u>	<u>0.842</u>	<u>0.832</u>	—	—	0.855	0.854
HybridMQA	0.892	0.897	0.887	0.896	0.912	0.919	0.897	0.927

