

Geo-metric dataset

Overview

Geo-metric dataset is a part of a paper titled *Geo-metric: A Perceptual Dataset of Distortions on Faces*. If you intend to use this data, please cite the paper mentioned above in your publication.

Dataset consists of five primary components:

1. Directory containing stimuli used in the subjective study described in the paper (*stimuli*).
2. Directory containing low resolution meshes used for stimuli generation (*lowpoly*).
3. Directory containing matlab scripts that allow JOD scaling of the attached results and computing correlation coefficients for metrics mentioned in the paper (*analysis*).
4. CSV file providing general information on the meshes (*Dataset.csv*).
5. CSV file containing responses from the conducted subjective study (*SubjectiveData.csv*)

Stimuli

All 2450 meshes used as stimuli are contained in directory *stimuli*.

Meshes are grouped by used base mesh and placed in separate directories.

Naming convention of the meshes is as follows:

`<base_mesh><distortion_type>_<distortion_parameter_1>_<distortion_parameter_2>.obj`

Example: BFA01-Noise_f0.01_a05.0000.obj

`<base_mesh>` : BFA01

`<distortion_type>` : Noise

`<distortion_parameter_1>` : f0.01

`<distortion_parameter_2>` : a05.0000

Note: For *Smoothing* and *Simplification* distortions *distortion_parameter_1* describes magnitude of distortion (number of smoothing iterations / percentage of triangles remained after simplification) and *distortion_parameter_2* is not used. For Noise distortion *distortion_parameter_1* describes frequency of used noise and *distortion_parameter_2* represents noise magnitude.

Low poly models

In addition we provide 100 low poly meshes used to generate stimuli for our study. They can be found in the *lowpoly* directory. Naming convention of the meshes is the same as the one used for stimuli described in the previous section.

Dataset.csv

File *Dataset.csv* provides essential information on the meshes. Below you can find a preview of it and description of all the columns.

Preview:

	A	B	C	D	E	F	G	H	I	J	K	L
1	basemesh	gender	race	dst_type	dst_filename	dst_filepath	ref_filepath	METRO	DAME	FMPD	MSDM	MSDM2
2	BFA01	Female	Asian	Noise_f0.01	BFA01-ref.obj	stimuli\BFA01	stimuli\BFA01\B	0	0	0	0	0
3	BFA01	Female	Asian	Noise_f0.01	BFA01-Noise_f0.(	stimuli\BFA01	stimuli\BFA01\B	0.003649	0.005033	0.000614	0.127305	0.185975
4	BFA01	Female	Asian	Noise_f0.01	BFA01-Noise_f0.(	stimuli\BFA01	stimuli\BFA01\B	0.006069	0.008396	0.002155	0.192008	0.283225
5	BFA01	Female	Asian	Noise_f0.01	BFA01-Noise_f0.(	stimuli\BFA01	stimuli\BFA01\B	0.00848	0.011772	0.004735	0.259038	0.345234
6	BFA01	Female	Asian	Noise_f0.01	BFA01-Noise_f0.(	stimuli\BFA01	stimuli\BFA01\B	0.010879	0.015166	0.008106	0.318193	0.390656

Description:

- *basemesh* - name of the base mesh used for stimuli generation.
- *gender* - gender of the head (base mesh).
- *race* - race of the head (base mesh).
- *dst_type* - type of applied distortion.
- *dst_filename* - filename of the distorted mesh.
- *dst_filepath* - file path of the distorted mesh.
- *ref_filepath* - file path of the corresponding reference mesh.
- *METRO* - score generated by METRO metric for given distorted and reference meshes.
- *DAME* - score generated by DAME metric for given distorted and reference meshes.
- *FMPD* - score generated by FMPD metric for given distorted and reference meshes.
- *MSDM* - score generated by MSDM metric for given distorted and reference meshes.
- *MSDM2* - score generated by MSDM2 metric for given distorted and reference meshes.

Note: If the score generated by metric has value of **-1**, that means that metric could not process a pair of selected meshes as they do not share the connectivity. These records should be rejected during analysis.

SubjectiveData.csv

File *SubjectiveData.csv* contains responses from conducted subjective study.

Below you can find a preview of it and description of all the columns.

Preview:

	A	B	C	D	E	F	G	H	I	J
1	observer	basemesh	dst_type	setting	condition_1	condition_1_filepath	condition_2	condition_2_filepath	selection	time
2	001	BFW01	Smooth	far_flipped	Smooth_i02	stimuli\BFW01\BFW0:Smooth_i12	Smooth_i12	stimuli\BFW01\BFW01	1	7.441406
3	001	BMB01	Noise_f2.00	far_flipped	Noise_f2.00	stimuli\BMB01\BMB0:Noise_f2.00	Noise_f2.00	stimuli\BMB01\BMB01	0	5.193604
4	001	BFW02	Noise_f2.00	far_normal	Noise_f2.00	stimuli\BFW02\BFW0:Noise_f2.00	Noise_f2.00	stimuli\BFW02\BFW02	0	3.062744
5	001	BMW02	Noise_f0.06	far_flipped	ref	stimuli\BMW02\BMW:Noise_f0.06	Noise_f0.06	stimuli\BMW02\BMW	0	2.213745
6	001	BMB01	Noise_f0.01	far_flipped	ref	stimuli\BMB01\BMB0:Noise_f0.01	Noise_f0.01	stimuli\BMB01\BMB01	0	10.55469
7	001	BFW01	Simp	far_normal	Simp_p25.00	stimuli\BFW01\BFW0:Simp_p12.50	Simp_p12.50	stimuli\BFW01\BFW01	0	7.474609
8	001	BMB01	Noise_f0.01	far_flipped	ref	stimuli\BMB01\BMB0:Noise_f0.01	Noise_f0.01	stimuli\BMB01\BMB01	0	2.413452

Description:

- *observer* - anonymized participant id for whom the answer has been registered.
- *basemesh* - name of the base mesh used for stimuli generation.
- *dst_type* - type of applied distortion.
- *setting* - setting used in a given trial. Specifies the distance between camera and the head and head orientation used in the trial (more information can be found in the paper).
- *condition_1* - specifies distortion applied to the first compared mesh.
- *condition_1_filepath* - file path to the mesh used as *condition_1*.
- *condition_2* - specifies distortion applied to the second compared mesh.
- *condition_2_filepath* - file path to the mesh used as *condition_2*.
- *selection* - specifies which mesh was perceived as the one having better quality compared to the reference mesh. Value of 0 means that condition_1 had better quality than condition_2 according to the participant and value of 1 represents the opposite situation.
- *time* - specifies the time that participant needed to provide an answer for a given trial.

Data analysis code

To run analysis of collected subjective data download the pairwise comparison scaling package from: <https://github.com/mantiuk/pwcmp>. Next, add path to the downloaded package in the line 8 of script *main.m* located in the *analysis* directory.

As the last step, run the script *main.m* using Matlab.