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ShapeWorks Documentation

ShapeWorks : Parameter Description and Usage

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Abstract

Outlines the basic parameters, their default values and the intuition behind them for shapeworks optimize function.

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1 Parameter Description

ShapeWorksRun is the function to be used for the particle based optimization which takes a set of shapes expressed in form of signed distance transforms and places a geometrically consistent set of particles (correspondences) on them. The function takes only one argument which is an xml parameter file, and the following if the tags to be used in that parameter file for shapeworks.

Table 1: The basic parameters for shapeworks

Parameter Name	**Default value**	Details (Intuition)
verbosity	0	0- error messages only, 1- notification of important steps, 2- additional details about parameters read from xml and files written, 3- iteration level information
number_of_particles	128	The number of particles to be placed, in powers of 2
output_dir	NA	Directory where the correspondences will be saved
inputs	NA	paths to the distance transforms of the data to be processed
point_files	NA	(Optional) Points for initialization on every shape
processing_mode	3	0- initialize only, 1- init+adaptivity, >=2- init+adaptivity+opt
adaptivity_mode	0	0- Surface sampling without constraints, 3- Surface sampling with constraints (plane and/or sphere)
optimization_iterations	2000	Number of optimization iterations
iterations_per_split	1000	Number of iterations for the point splitting
init_criterion	1.00E-06	
opt_criterion	1.00E-06	
use_shape_statistics_in_init	FALSE	
procrustes_interval	0	The interval between procrustes runs, 0 when procrustes is to be turned off
procrustes_scaling	0	If the scaling in procrustes is to be enabled or not
relative_weighting	1	Relative weight between the sampling and correspondence terms of the objective function
initial_relative_weighting	0.05	
starting_regularization	1000	Starting regularization value
ending_regularization	1 4	Ending regularization value
recompute_regularization_interval	1	
save_init_splits	TRUE	This save particles for each split during the initialization
checkpointing_interval	50	
keep_checkpoints	0	

Table 2: Mesh based shapeworks parameter tags

Current name	**Default value**	**Intuition**
init_criterion	1.00E-06	
opt_criterion	1.00E-06	
mesh_based_attributes	0	If the mesh based shape works is used set this to 1, 0 otherwise
attributes_per_domain	NA	
mesh_based_attributes	FALSE	
use_xyz	NA	
use_normals	NA	
mesh_files	NA	
attribute_scales	NA	
attribute_files	NA	
attribute_grad_files	NA	