EECE 437
Individual Project
Compare Tool for Stl Files : Progress report

Bilal M. Ghader

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1 Introduction

The project is formatted as a FreeCAD benchmark: **MeshCompare**, this FreeCAD benchmark includes several functions and tools that allows the user to perform Mesh compare and visualization of Mesh compatible file format notably .stl and .obj.

2 Installation and Setup

To be able to use this tool, the FreeCAD software is needed. After downloading FreeCAD, kindly perform the following steps:

- download this repository :GitHub Repository

- copy the MeshCompare folder

- Paste the MeshCompare folder in FreeCAD Mod directory usually found under *C:\Program Files\FreeCAD 0.16\Mod*

- Relaunch FreeCAD, you should find MeshCompare in FreeCAD Workbench List.

3 File Structure

TheGitHub Repository includes the following files :

- *Init.py* : Used to load dependencies files from the FreeCAD libraries and setup some required settings.

- *InitGui.py* :Configure the GUI of the Benchmark **MeshCompare**.

- *ImportOriginal.py* : Includes the functions Original and ToCompare used to import the STL or OBJ files.

- *Diff.py* : Includes the Addition, Deletion, Similarities, and Analyze functions that takes 2 STL files and compare them.

- *Export.py*: Includes the overloading of the Export Tool of FreeCAD, this function exports the currently selected object to STL or OBJ file format.

- *Visualization.py* : Includes the smooth function, used to smooths the currently selected Mesh.

- *Readme.md* : Read me file including details about the project.

4 The User interface

Once the Workspace is loaded, the different functions appears as GUI item on the tool-bar. Each set of functions is separated from the others by a visual separator. The different functions families are:

- *Import* : Incldues the importOriginal and importToCompare functions. These function initiate a file in FreeCAD in case no files exists. The main purpose of these functions is to load the Original item and the revised version item.

- *MeshCompare* : The main part of the benchmark, includes 4 functions: *Additions, Deletions, Similarities, and Analyze.* Each of these functions takes *MeshOriginal* and *MeshToCompare* as arguments and showcase on a new file, the additions, deletions and similar parts respectively. The Analyze functions return the additions, deletions and similarities in one file superimposed but each in a different color.

- *Export* As explained earlier this is a singular function that allows the export of Mesh files to STL or OBJ format.

- *Visualization* : Also includes only one function which is *smooth* which allows to smoothen the surface of the selected Mesh.