User Instruction Manual for Ultimaker Cura Plugin

“FitnSit”

Developed as Part of the Software Practical Course

“Multimodal Media Madness”

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1. Introduction

“FitnSit” is a plugin for Ultimaker Cura developed to address the problem of printing over-dimensional 3D objects. Up to now printing 3D objects that did not fit within the build volume of Cura, users had to use various CAD programs to cut the 3D object into different parts, printed individually.

The plugin solves this issue by presenting the user with the possibility to cut their respective object either automatically or manually into different parts. “FitnSit” thus ensures the efficient printing of oversized 3D designs, given that users no longer have to use multiple softwares but are rather able to do everything in one place. This is particularly beneficial for users who have no experience with CAD software. Below you will find detailed explanation of each functionality of the plugin.

To use the plugin, download the zipped file and extract the folder named “FitnSit” to the plugin directory of the Ultimaker Cura application.

2. Automatic Cutting

After having downloaded the plugin and moved to the directory of Cura, open the application and load a file onto the Cura workspace. For demonstration purposes of this manual, the 3D-object whose dimensions surpass the build volume of Cura, as shown in the below image has been created.

The highlighted error message indicates that the selected object is too big to slice and print in Cura. To be able to print it, use the FitnSit plugin by choosing it from the Extension menu, as shown in the following image. Make sure you have loaded and selected your object in the workspace before running the plugin.

Running the Cutting Tools, will open the plugin dialog, which consists of three tabs, for the different cutting modes. This section demonstrates an automatic cut example. In this mode you can cut the object into a number of parts, ranging from 2-10. The object can also be cut along the x, y or z axis, highlighted using Cura axes colors.

Upon deciding the number of parts and the cut axis, you will see a message describing whether the cut object is watertight or not, as shown below. The “cap object” checkbox presents the possibility to make the cut object watertight using a cap.

In the below case, cutting the object into two parts along the z Axis and enable capping, results into a watertight mesh.

When performing the cut, if no object is selected in the Cura workspace, an error message will appear. After pressing the cut button, if the cut was successful you will be presented with a “Done!” message in Cura. At the bottom of the dialog, a list with your results will be visible. Next to the result list is a button to deploy the resulted mesh onto the Cura workspace, as shown below.

The below image depicts the result of deploying Mesh1 and Mesh2 from the result list onto the Cura workspace. As seen in the image the two results are now highlighted in yellow, which indicates that the object is watertight and now possible to print.

In the following case the tower is cut into 4 parts along the z axis and not capped. Upon choosing one of the four meshes in the result list and pressing view, you will be able to see the resulted cut in their default 3D-viewer.

3. Graphical Cutting

After having downloaded the plugin and moved to the directory of Cura, open the application and load a file onto the Cura workspace. For demonstration purposes of this manual, the 3D-object whose dimensions surpass the build volume of Cura, as shown in the below image has been created.

The highlighted error message indicates that the selected object is too big to slice and print in Cura. To be able to print it, use the FitnSit plugin by choosing it from the Extension menu, as shown in the following image. Make sure you have loaded and selected your object in the workspace before running the plugin.

Running the Cutting Tools, will open the plugin dialog, which consists of three tabs, for the different cutting modes. This section demonstrates a graphical cut example, so you will need to select the Graphical Cutting Tab. In this mode you can cut the object in one of the four Cura views: Front, Top, Left, Right.

Upon deciding which view you would like to cut in, the blue border Rectangle in the top right corner of the Tab will display the outline of your original object in the selected view, as seen below.

As instructed, you can draw a desired cutting line of where you would like to cut the object. Use your mouse to press and release the cutting line inside the outline of the object. The “cap object” checkbox presents the possibility to make the cut object watertight using a cap.

In the below case, cutting the object along the middle in the front view and enabling capping, results into a watertight mesh.

When performing the cut, if no object is selected in the Cura workspace, an error message will appear. After pressing the cut button, if the cut was successful you will be presented with a "Done!" message in Cura. At the bottom of the dialog, a list with your results will be visible.

Next to the result list is a button to deploy the resulted mesh onto the Cura workspace, as shown below.

Upon choosing one of the two meshes in the result list and pressing view, you will be able to see the resulted cut in their default 3D-viewer.

4. Advanced Cutting

After having downloaded the plugin and moved to the directory of Cura, open the application and load a file onto the Cura workspace. For demonstration purposes of this manual, the 3D-object whose dimensions surpass the build volume of Cura, as shown in the below image has been created.

The highlighted error message indicates that the selected object is too big to slice and print in Cura. To be able to print it, use the FitnSit plugin by choosing it from the Extension menu, as shown in the following image. Make sure you have loaded and selected your object in the workspace before running the plugin.

Running the Cutting Tools, will open the plugin dialog, which consists of three tabs, for the different cutting modes. This section demonstrates an advanced cut example, so you will need to select the Advanced Cutting Tab. In this mode you can cut the object in one of the four Cura views: Front, Top, Left, Right and along a coordinate specified line.

Before inputting the coordinates, you can click on “Grab dimensions” to get an orientation of how big your object is. Then you can specify your x and y values of each point, as shown in the graphic below.

Upon deciding in which view you want to cut, you will see a message describing whether the cut object is watertight or not, as shown below. The “cap object” checkbox presents the possibility to make the cut object watertight using a cap.

When performing the cut, if no object is selected in the Cura workspace, an error message will appear. After pressing the cut button, if the cut was successful you will be presented with a “Done!” message in Cura. At the bottom of the dialog, a list with your results will be visible.

Next to the result list is a button to deploy the resulted mesh onto the Cura workspace, as shown below.

Upon choosing one of the two meshes in the result list and pressing view, you will be able to see the resulted cut in their default 3D-viewer.