CODA
CODA AUDIO

Operation Manual

- S.U. Exporter Extension v1.0.2 -

1. The Application

S.U. Exporter is a plugin / extension designed for SketchUp® that allows users to export data from SketchUp into CODA's System Optimiser. Tools are provided for streamlining this process, their operation is summarised herein.

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4. Requirements

4.1. Hardware Minimums

This software does not require any special hardware to function. If the minimum hardware requirements for both SketchUp and System Optimiser are met, then successful execution should be assured.

4.2. Software

This software was developed & tested with **SketchUp Pro 2020** version 20.1, on both macOS and Windows. Compatibility with previous versions of SketchUp Pro / SketchUp Make may be possible, but are not supported or tested.

The software will export venue files compatible with CODA System Optimiser v0.5 and upwards. Compatibility with previous versions of CODA System Optimser may be possible, but is not supported or tested.

5. Changelog

5.1. v1.0.2 | Initial Release

Features:

- Erasing of unused edges.
- Layer texture / colour / material flattening.
- Triangulation of selected surfaces.
- Exporting of surfaces.

6. Installation

*Note – it is recommended to uninstall previous versions of S.U. Exporter prior to installing the latest version. To uninstall the previous version, open SketchUp, and click **Window** then **Extension Manager**. Select the **Manage** tab at the top of the window, then click **Uninstall** next to the older version of the plugin.*

The download for the S.U. Exporter extension contains:

- This document.
- The 'CODA SU Exporter v1.0.2.rbz' file

Procedure to install S.U. Exporter:

- Launch SketchUp.
- Click **Window** then **Extension Manager**.
- Click **Install Extension**.
- Browse to **CODA SU Exporter v1.0.2.rbz**
- Close the Extension Manager.

7. Features

To access the features of S.U. Exporter, click the **Extensions** menu entry then select **CODA**.

Note – The processes & tools presented here destructively perform their methods on the active SketchUp model, so care should be taken to save a duplicate file first before committing these operations to ensure successful restoration of the model, if so desired.

7.1. About

This displays the version & contact information of the installed extension.

7.2. Erase Unused Edges

The desired outcome from using this extension is the successful transfer of a collection of 'faces' from SketchUp, that will become 'Free Planes' within System Optimiser. We are not trying to export random edges that are not connected at both ends, faces that are not completely bound by edges, or hidden geometry. The 'Erase Unused Edges' tool will iterate through the whole
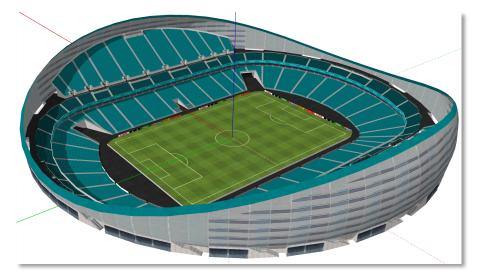
drawing and remove any entities that match these criteria. It will iterate through all the nested groups, to remove surfaces that are not required.
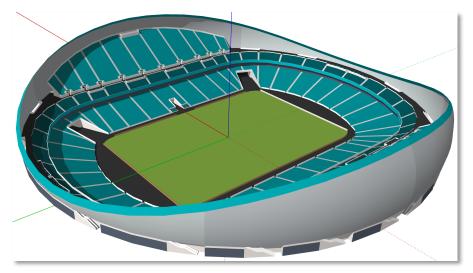
7.3. Flatten Materials

To add realism to a SketchUp model, it is possible to add materials (textures / colours) to selected entities within the model. These materials can be added to either side of a face independently. To bring this realism into System Optimiser, the Flatten Materials tool should be used. This tool will perform the following actions:

- If there is a specified front material AND back material, the back material will be discarded & the front material will be copied to the rear.
- If the material is on the back of the face only, it will be copied to the front.
- All materials in the file are then replaced with a solid colour, closest to that of the material.
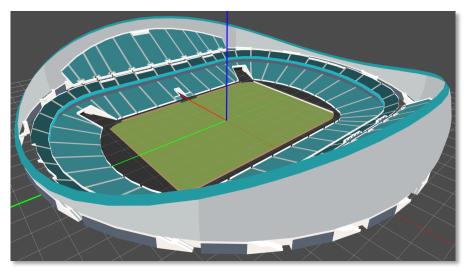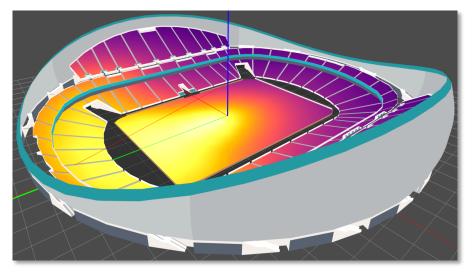

[Fig 1 – Example SketchUp File [1]]

[Fig 2 – After Flatten Materials tool has been used]

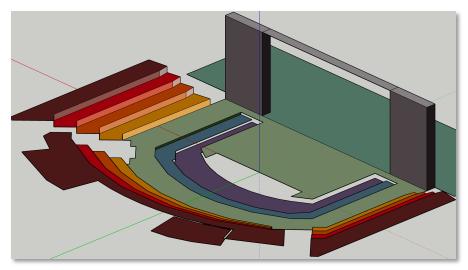*[Fig 3 – File imported into System Optimiser]*

[Fig 4 – Example of resultant mapping]
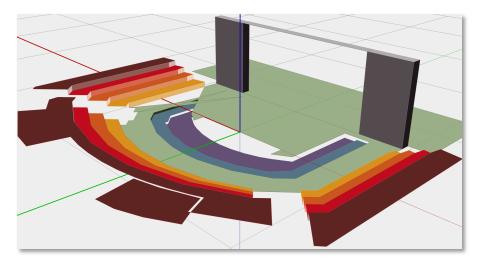
7.4. Triangulate Selected

System Optimiser, like many of its counterpart 3D modelling applications, cannot calculate or map on self-intersecting surfaces, nor on surfaces which are concave. This tool is designed to 'triangulate' these faces, allowing them to be accurately mapped in System Optimiser.

Ordinarily with the majority of models, this tool is not needed, but on occasion it may be noticed that a surface has not been imported into System Optimiser correctly. This is the occasion where this tool should be considered. Simply select the surface within SketchUp and apply the "Triangulate Selected" tool, and the selected surface will be divided up into individual triangles.
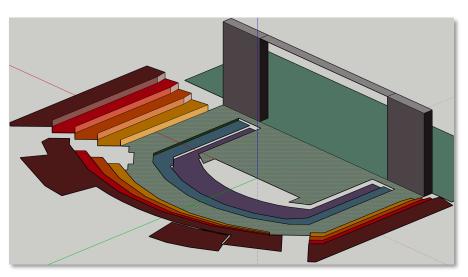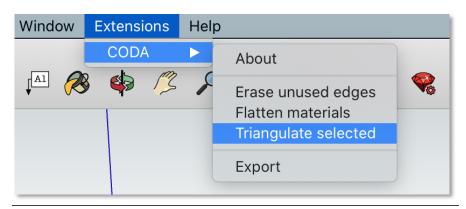
[Fig 5 – Example SketchUp File]

[Fig 6 – Example SketchUp File imported into System Optimiser]
(Notice the malformed surface downstage of the stage right proscenium)
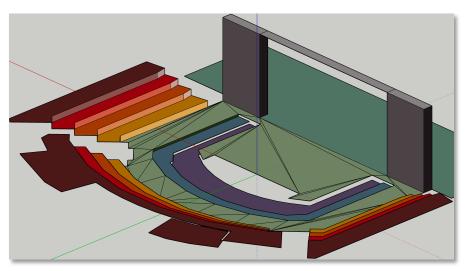

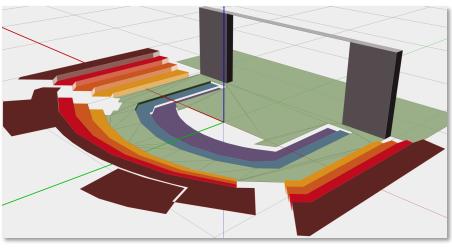*[Fig 7 – Returning to SketchUp – selecting the concave face]*

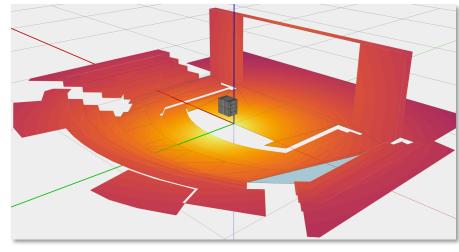[Fig 8 – Selecting the "Triangulate selected" tool]

[Fig 9 – The problematic concave face is now split into triangles]

[Fig 10 – Back in System Optimiser – The face now is drawn correctly]

[Fig 11 – Mapping now renders correctly]

7.5. Export

If you hadn't guessed it already, the export menu item begins the export process. There is a fundamental concept to understand before you do the export however! *Keep reading young jedi..*

> Faces that are **selected** within the SketchUp file will be exported as Audience Layers.
> Faces that are **not selected** within the SketchUp file will be exported as Scenery.

This makes it very quick and easy to determine which areas you want SPL Calculation performed on within System Optimiser (Audience Layers), which is far less computationally expensive than calculating all surfaces unnecessarily.

When a layer is exported as an Audience Layer by the SketchUp Extension, it will have the following properties applied to it in System Optimiser:

Property	Value
Hide	False
Enable	True
Obstacle	False
Scenery	False

And for Scenery layers:
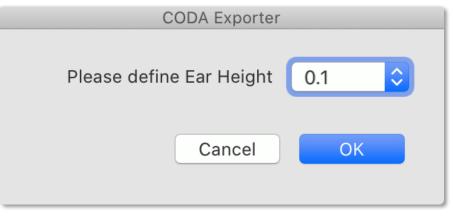
Property	Value
Hide	False
Enable	False
Obstacle	False
Scenery	True

Once you have selected the surfaces you wish to define as Audience Layers, then clicked **Extensions \ CODA \ Export**, you will be presented with a dialog where you can define the audience layer ear height:

[Fig 12 - Ear Height selection dialog]

Note: Scenery layers do not have an ear height layer drawn within System Optimiser.

Note: There is logic within the extension which automatically sets the ear height of any audience layer which is found to be vertical (for instance, a wall) to zero. This will prevent the ear height layer being drawn in the same place as the surface layer.

Note: If the ear height is set to zero, there will be no underlying surface layer drawn underneath the ear layer, therefore any coloured surfaces will not be drawn within System Optimiser, only the light blue ear layers.

After the Ear Height is defined, the extension will present a dialog stating what has been found for export. In terms of what is an acceptable number of areas to export, there are no hard and fast limits, but with a modern computer, it has been found that with a few hundred Audience layers, and a couple of thousand Scenery layers, acceptable performance can be expected.

[Fig 13 - Export Notification dialog]

The file that is exported will have the file extension **.cvlf**. This file can be imported into a System Optimiser project using the **Import** button on the **VENUE** page of System Optimiser:

[Fig 14 - Import button on the VENUE page]

8.   References

[1] MartinLeRoy, 2014. *Arriva Stadium*. 3DWarehouse. [Accessed July 2020]
https://3dwarehouse.sketchup.com/model/2a5df249bafa259433dc4b1d78b757f/Arriva-Stadium

Model used in accordance with Section 1.B.ii of the 3D Warehouse terms of use, accessed July 2020.