

VISUAL COMPONENTS 4.0 ADD-ON

SURFACE MAKER

Here is the Add-On attached with this community post. Please download the attachment and unzip the file. Then move the unzipped file to the location –

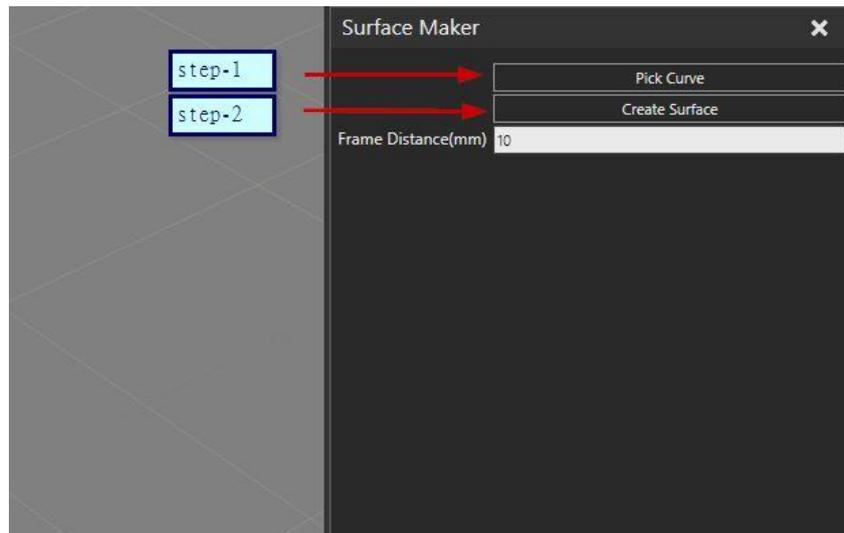
C:\Users\muhamJa1\Documents\Visual Components\4.0\My Commands

There is also a *.vcm component which is for the tutorial purpose. Please download the file [CAD_Test.vcm] as well.

Now open VC Premium and then load the CAD_Test.vcm into 3D world. Next go to Tab > Modeling and there user will find the Add-On in

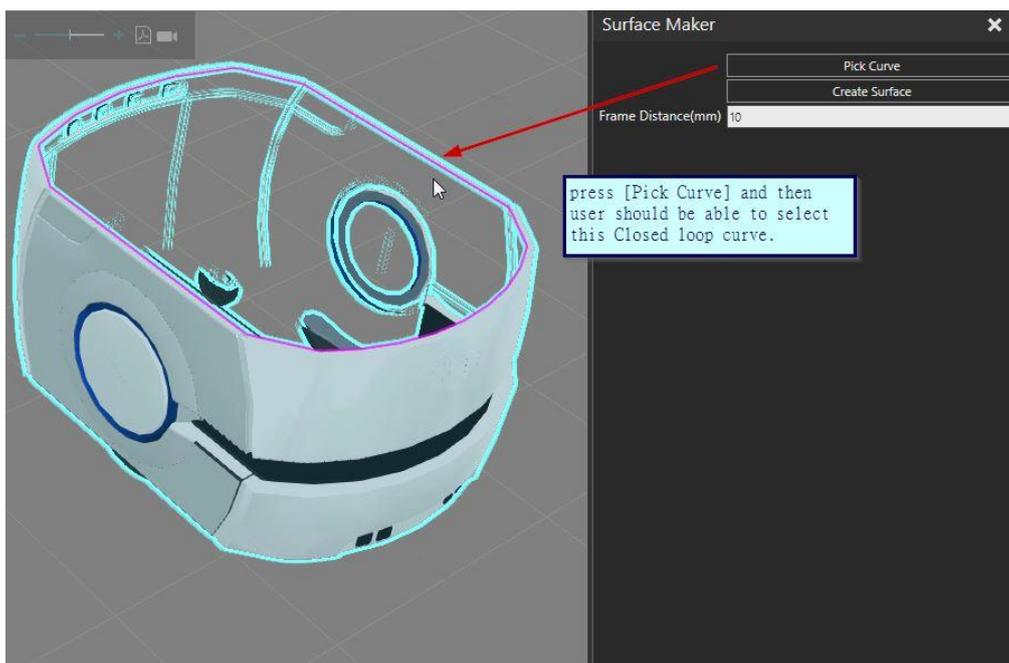
Wizards > My Add-On > Surface Maker

Now the Add-On will open as following.

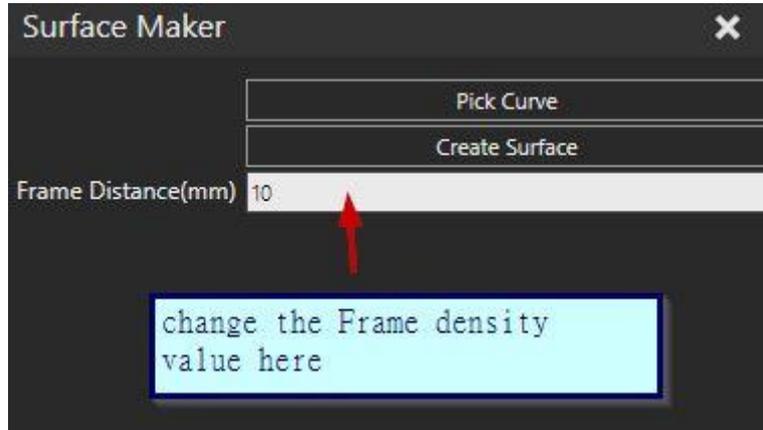


Complete Loop

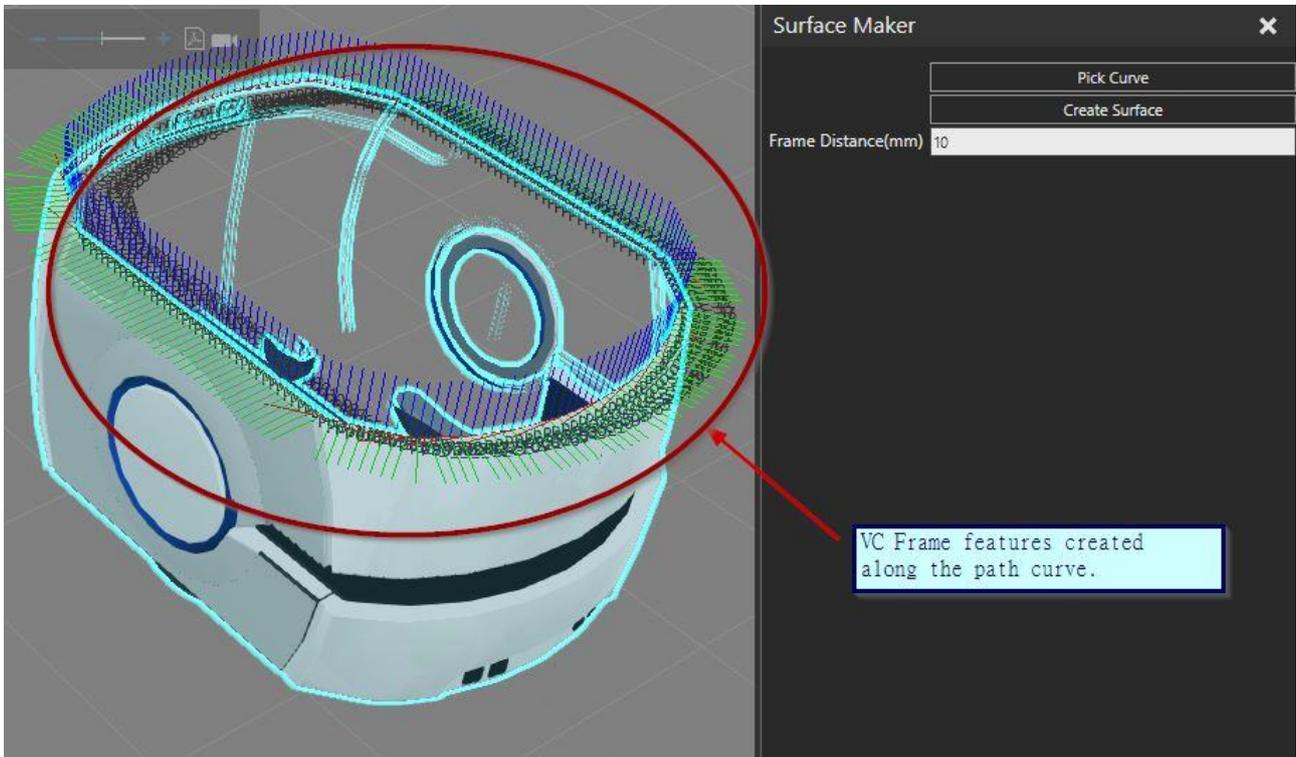
Now click the button > [Pick Curve]; now we need to select the curve on the hollow surface of the CAD file. Here “interactiveTopologyPick” is used to get handle to topology of the CAD file.



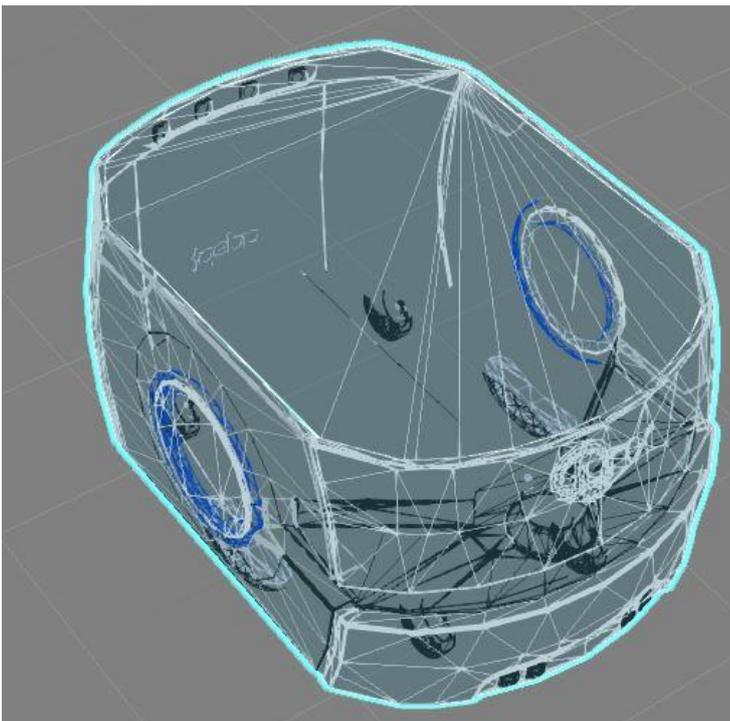
Now after the closed loop curve has been selected press Enter on keyboard. User will see the set of Frames create along the curve. To change the density of the Frames user can change the value of REAL property [Frame Distance(mm)] before the [Pick Curve] operation.



See of Frames creates along the curve path as following.



Now press the button [Create Surface] and user will see the Surface created utilizing the set of Frames created. User will see as following in mode #Shaded and #WireFrame

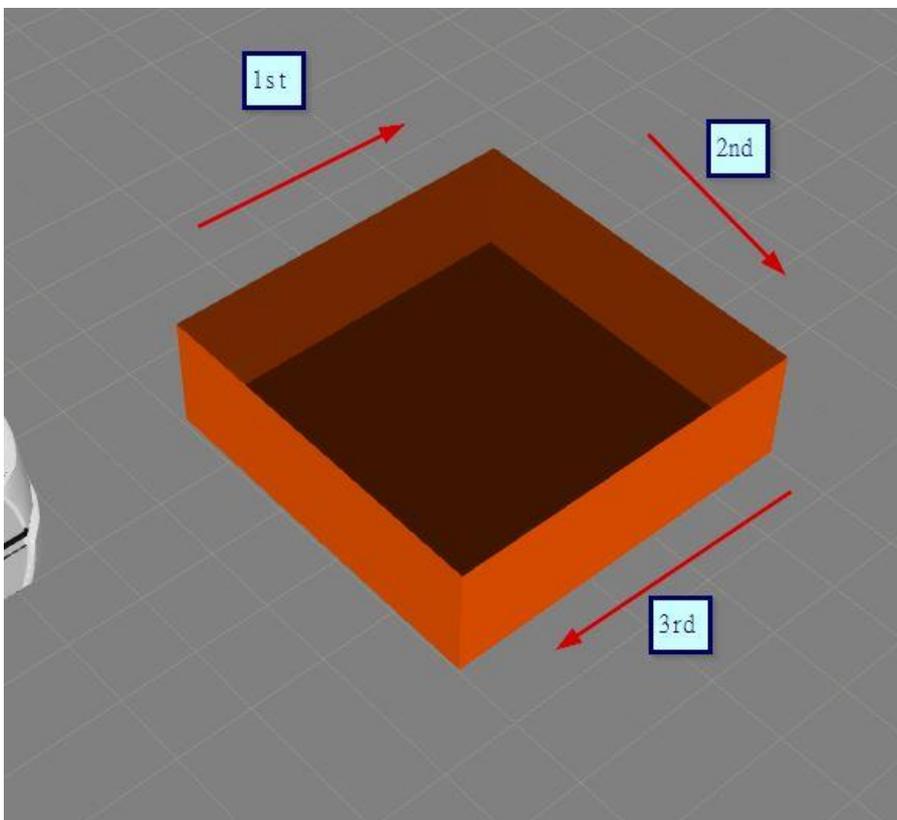
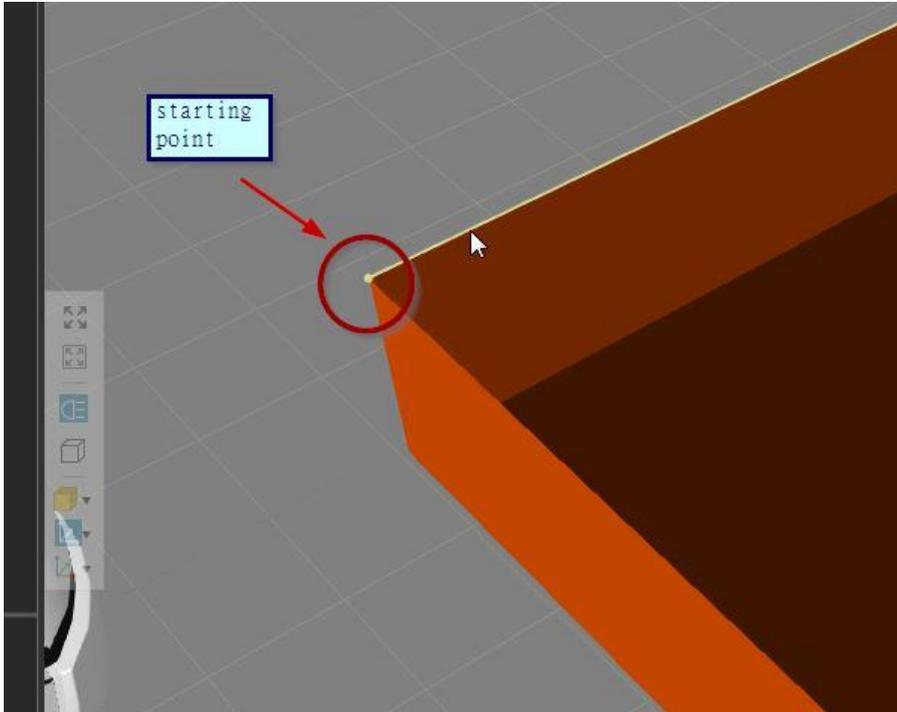


The Add-On deletes automatically the Frame features which were created during the Surface Creation process.

Incomplete loop

Now open the 2nd CAD file [SquareBox.vcmx] from the folder [CADtutorial]. In this example the user is going to select the 3 edges of the box in clockwise manner, then create the surface.

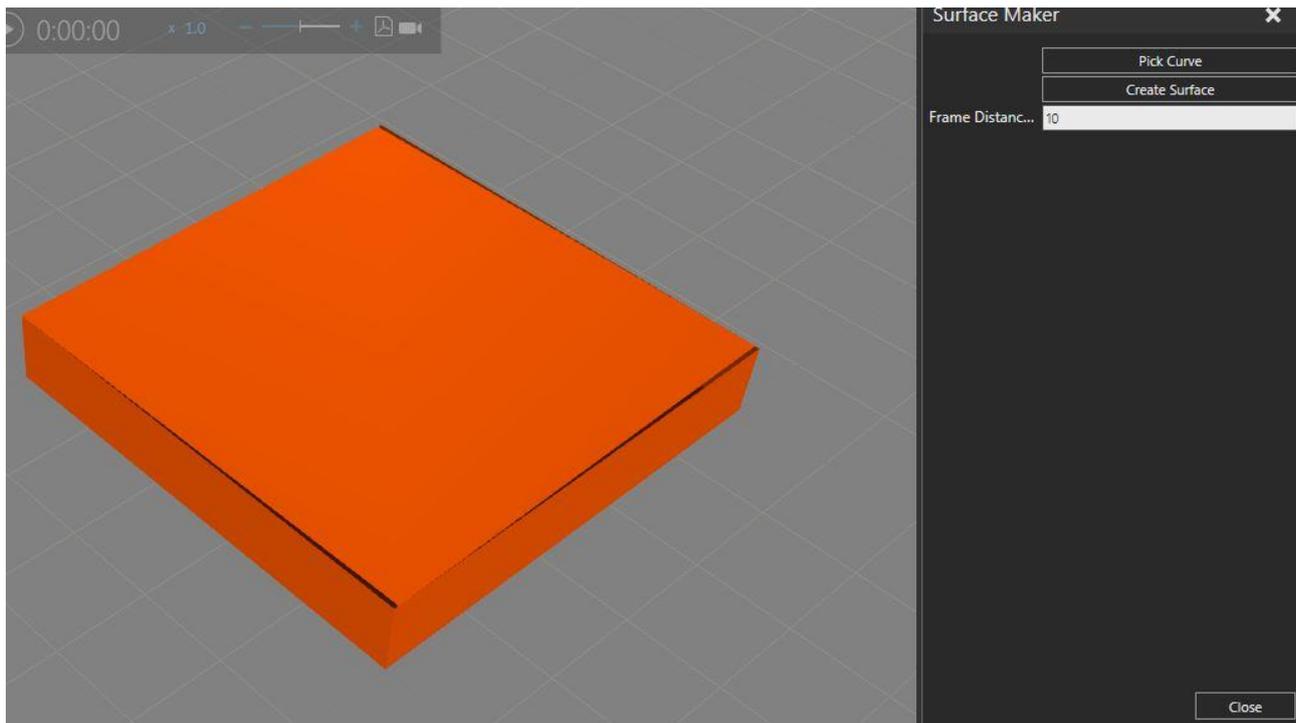
Now click the button > [Pick Curve]; now we need to select the curve on the edge of the box geometry. Here “interactiveTopologyPick” is used to get handle to topology of the CAD file.



Please note that when selecting the curve be careful to take into account the direction of the path propagation. The tiny little yellow circle denotes the starting point of the line propagation. The user can select the starting point position by selecting the edge either from the right corner or left corner, the closest end point of edge closest to selection becomes the starting point.

Now select the 3 edges of the box as shown in above screenshot. Prior to this select the number in [Frame Distance(mm)] . After selecting the curve press [Enter], this will create Frames along the selected curve. To see the frames user needs to set the Frame visibility ON.

Finally select [Create Surface] to create the surface.



The main part of Python code for this Add-On is as following:

```
12 def picked(cmd):
13     global topo_pick, comp
14     comp = None
15     name_index = 0
16     # Delete all frames from the picked component(s)
17     for t in topo_pick.TargetCurves:
18         node = t[0]
19         comp = node.Component
20         for i in comp.RootFeature.Children:
21             if i.Type == VC_FRAME and 'Pos_' in i.Name:
22                 i.delete()
23     # Use topology data of the picked curves for creating frames along the curves
24     for t in topo_pick.TargetCurves:
25         node = t[0]
26         g_set = t[1]
27         curve_index = t[2]
28         curve_direction = t[3]
29         comp = node.Component
30         topo = g_set.Topology
31         le = topo.getCurveLength(curve_index)
32         a = 0
33         transform_node = comp.RootFeature.createFeature(VC_TRANSFORM, "Frames Holder")
34         while a < le:
35             pos = topo.getCurvePosition(curve_index, a) # returns a matrix position at a certain len
36             a += getProperty('Frame Distance(mm)').Value
37             name_index += 1
38             frame = transform_node.createFeature(VC_FRAME, 'Pos_%i' % name_index)
39             frame.PositionMatrix = pos
40             frame.rebuild()
41         topo_pick.OnTargetSet = None
42
43 def nowPick(arg):
44     global topo_pick
45     topo_pick = app.findCommand('interactiveTopologyPick')
46     topo_pick.SnapOnCurve = True
47     topo_pick.SnapOnCurveLoop = True
48     #topo_pick.SnapOnSurface = True
49     topo_pick.ContinuousMode = True #allows user to pick a chain of multiple curves
50     topo_pick.FaceDisplayMode = VC_FACEDISPLAY_FACE
51     topo_pick.OnTargetSet = picked
52     topo_pick.execute()
53     print 'step-1: Pick curve and then press [Enter]\'
54     print 'step-2: Press [Create Surface] to create surface along the Frames\'
55
56 def createCurve(arg):
57     global comp, pos_previous_WPR
58
59     geoFeat = comp.RootFeature.createFeature(VC_GEOMETRY, "Surface_Geometry")
60     geoSet = geoFeat.Geometry.createGeometrySet(VC_TRIANGLESET)
61     child = comp.findFeature("Frames Holder")
62     pos_previous_WPR = 0
63
64     for i in child.Children:
65         if i.Type == VC_FRAME:
66             vec1 = i.PositionMatrix.P
67             if notOnSameLine(i):
68                 geoSet.addPoint(vec1)
69                 pos_previous_WPR = i.PositionMatrix.WPR
70
71     for i in range(1, geoSet.PointCount-1):
72         geoSet.addTriangle(0, i, i+1)
73
74     comp.rebuild()
75     frame_holder = comp.findFeature("Frames Holder")
76     frame_holder.delete()
77
78 def notOnSameLine(pos_current):
79     global pos_previous_WPR
80     if pos_previous_WPR:
81         pos_current_WPR = pos_current.PositionMatrix.WPR
82         if pos_current_WPR == pos_previous_WPR:
83             return False
84         else:
85             return True
86
```