1: Part 1:
2: Input: initial cross sections
3: Output: cross sections rotated perpendicular to longer horizontal main axis by minimization of cross section area
4: **for** each initial section **do**
5:     **for** each of 38 rotation steps (0° to 180° in 5° increments) **do**
6:         Compute rotation angle (theta)
7:         Apply rotation matrix to original normal ([1,0,0] or [0,1,0]) to get rotated normal
8:     end **for**
9:     **for** each rotated normal **do**
10:         Slice mesh using rotated normal and center point of section
11:         Retrieve vertices from rotated slice
12:         Project cross section into YZ plane to calculate area
13:         Compute centroid of this projected section
14:         Sort points by angle relative to centroid
15:         Compute area of polygon using sorted points and shoelace formula
16:     end **for**
17: end **for**
18:
19: Part 2:
20: Input: rotated cross sections
21: Output: rotated cross sections after artifact correction
22: Step 1:
23: **for** each rotated cross section **do**
24:     set vertex with lowest z-value as vertex index=0
25:     perform normalized nearest neighbour algorithm
26: end **for**
27:
28: Step 2:
29: **for** each section after normalized nearest neighbour algorithm **do**
30:     apply correction criterion
31:     **if** correction criterion = True **then**
32:         initialize manual vertex order correction in plotly.dash
33:         **for** each section with artifacts **do**
34:             correct vertex order by clicking on previous (correct) vertex **then** incorrect vertex
35:         end **for**
36:     end **if**
37: end **for**
38:
39: Part 3:
40: Input: corrected cross sections of 1st direction
41: Output: corrected cross sections of orthogonal direction
42: **for** each section of 1st direction **do**
43:     raster section vertically into 22 vertical lines
44:     **for** each vertical line **do**
45:         retrieve X, Y and Zmin+Zmax - coordinates
46:     end **for**
47: end **for**
48:
49: **for** 2 consecutive sections of 1st direction **do**
50:     **for** all vertical lines in both sections **do**
51:         extract X, Y and Zmin+Zmax (=2 points per section)
52:         combine 4 points into trapezoidal segment
53:     end **for**
54: end **for**
55:
56: **for** every index of vertical lines **do**
57:     combine trapezoidal segments to assemble uncorrected orthogonal section
58: end **for**
59:
60: **for** uncorrected cross sections of orthogonal direction
61:     repeat Part 2
62:
63: Part 4:
64: Input: all cross sections
65: Output: horizontal and vertical dimensional measurements
66: **for** each cross section of 1st direction except index 0 & 21 **do**
67:     rotate & project section onto YZ plane
68:     create 5 horizontal and vertical measurement transects
69:     measure horizontal and vertical dimensions between intersections of transect and polygon
70: end **for**
71:
72: **for** each cross section of orthogonal direction except index 0 & 21 **do**
73:     rescale sections (corresponds to rotation & projection onto YZ plane)
74:     create 5 horizontal and vertical measurement transects
75:     measure horizontal and vertical dimensions between intersections of transect and polygon
76: end **for**
77:
78: **for** all cross sections **do**
79:     compute gradients
80:     compute curvatures
81: end **for**