

THE BRIDGES



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DM2 | Finale

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the PERSON

Wanda Rutkiewicz - 4 February 1943 – 12–13 May 1992) was a Polish mountaineer and computer engineer. She was the first woman to reach the summit of K2 and the third woman (first European woman) to summit Mount Everest.

She was one of history's best female alpinist. I chose four of the most important mountains she summited. The ones over 8000m are Mount Everest, Nanga Parbat, K2, Shisha Pangma, Gasherbrum I, Gasherbrum II, Cho Oju and Annapurna.



the PROJECT

In the memory of her achievements I wanted to make a collage of surfaces of some of the highest mountains in the world (Annapurna, Nanga Parbat, K2 and Mount Everest), she summited with suspension bridges.

The bridges connect the highest points of the mountain models. Their width and suspension length depends on the distances between the mountains. The models are in their original geographical position.



the CODE

First step of the code is to define the highest points of four mountains that are in a separate rhino file, imported in their geographical position. The rest is based on a definition to make a bridge, which is repeatedly used to create bridges with handrailings and planks between defined peaks. The suspension of the bridge depends on bridge's length that's why there's no collision of two bridges crossing each other paths.

```
24 mountain1 = rs.ObjectsByName("DEM_35_12_4_074_34_3", 0)          ### sel by name
25 coords1 = dm.getSurfacePoints( mountain1[0] )                    ### get coords of surface-Control-points !
26 coordsSorted1 = sorted(coords1, key=lambda sKey: sKey[2])        ### that's essential ! (sort by z_coord)
27 max1 = coordsSorted1[-1][2]
28 rs.AddPoint(max1)
29
51 peaks = [max1,max2,max3,max4,max1, max2,max4, max3,max1]

53 def makeBridge (max1,max2):
54     vec1 = rs.VectorCreate(max1,max2)
55     vecWidth = rs.VectorScale(rs.VectorRotate(vec1, 90, [0,0,1]),.02)    #vectowidht change last input
56     vecMid = rs.VectorScale(vec1, 0.5)
57     midPoint = rs.VectorAdd(max2, vecMid)
58     vecLen = rs.VectorLength(vec1)
59
60     # walkpath
61
62     #rs.AddPoint(midPoint)
63     DownScale = 0.07
64     downVec = rs.VectorSubtract([0,0,0],[0,0,(vecLen * DownScale)])
65     lowPoint = rs.VectorAdd(midPoint, downVec)
66     widPnt1 = rs.VectorAdd(lowPoint, vecWidth)
67     widPnt2 = rs.VectorAdd(lowPoint, rs.VectorRotate(vecWidth,180,[0,0,1]))
68     rs.AddPoint(widPnt1)
69     rs.AddPoint(widPnt2)
70     points1 = [max1,widPnt1,max2]
71     points2 = [max1,widPnt2,max2]
72
73     walkL = rs.AddCurve(points1,2)
74     planksL = rs.DivideCurve(walkL, 100)
75     walkR = rs.AddCurve(points2,2)
76     planksR = rs.DivideCurve(walkR, 100)
77     rs.AddPoints(planksL)
78     rs.AddPoints(planksR)
79     for j in range(len(planksR)):
80         rs.AddCurve([planksL[j],planksR[j]])
81
82
83     #handrailing
84     DownScale = 0.05
85     downVec = rs.VectorSubtract([0,0,0],[0,0,(vecLen * DownScale)])
86     lowPoint = rs.VectorAdd(midPoint, downVec)
87     widPnt1 = rs.VectorAdd(lowPoint, vecWidth)
88     widPnt2 = rs.VectorAdd(lowPoint, rs.VectorRotate(vecWidth,180,[0,0,1]))
89     rs.AddPoint(widPnt1)
90     rs.AddPoint(widPnt2)
91     points1 = [max1,widPnt1,max2]
```