

***'Exploring Software approaches in
simulating bending-active systems'***

*Riccardo La Magna
Julian Lienhard*

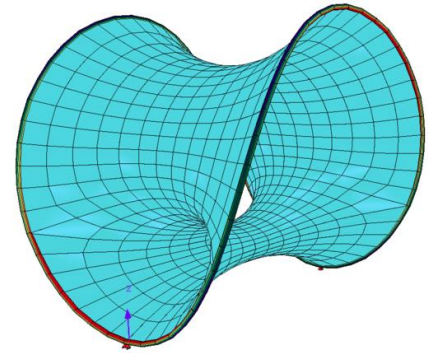
*Anna Bauer
Philipp Längst*

Gregory Quinn

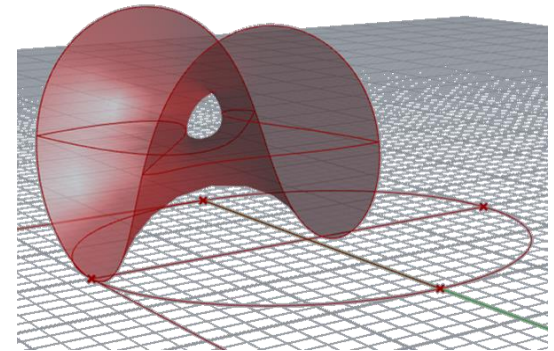
co-organised by



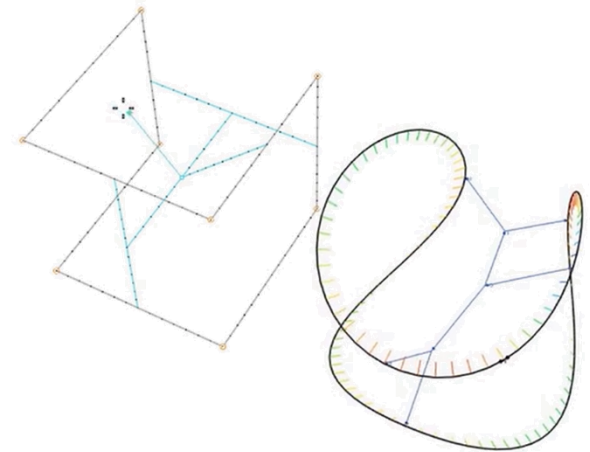
Mesh based FEM Sofistik



Nurbs based IGA Carat++



Vector based DR Kangaroo



Mesh based FEM Sofistik

FRIDAY 22.09.2017 9:00 – 18:00

Riccardo La Magna, Julian Lienhard

Nurbs based IGA Carat++

SATURDAY 23.09.2017 9:00 – 18:00

Anna Bauer, Philipp Längst

Vector based DR Kangaroo

SUNDAY 24.09.2017 9:00 – 15:00

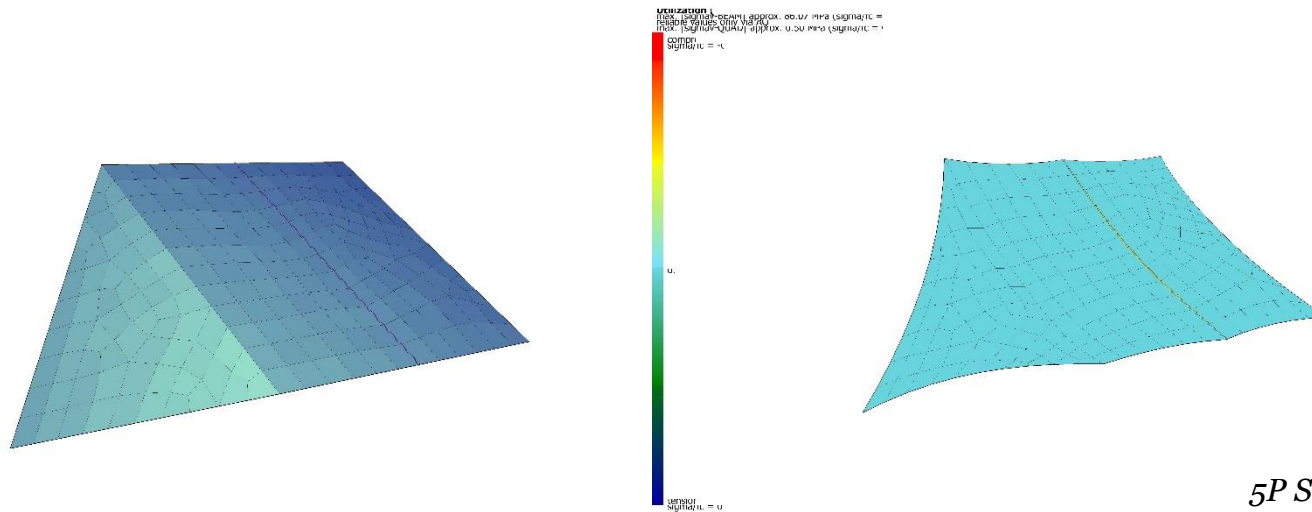
Gregory Quinn

Final comparing round and discussion

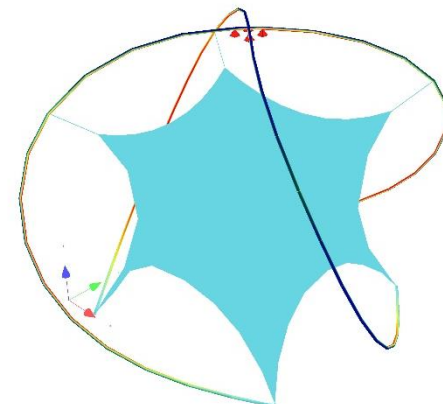
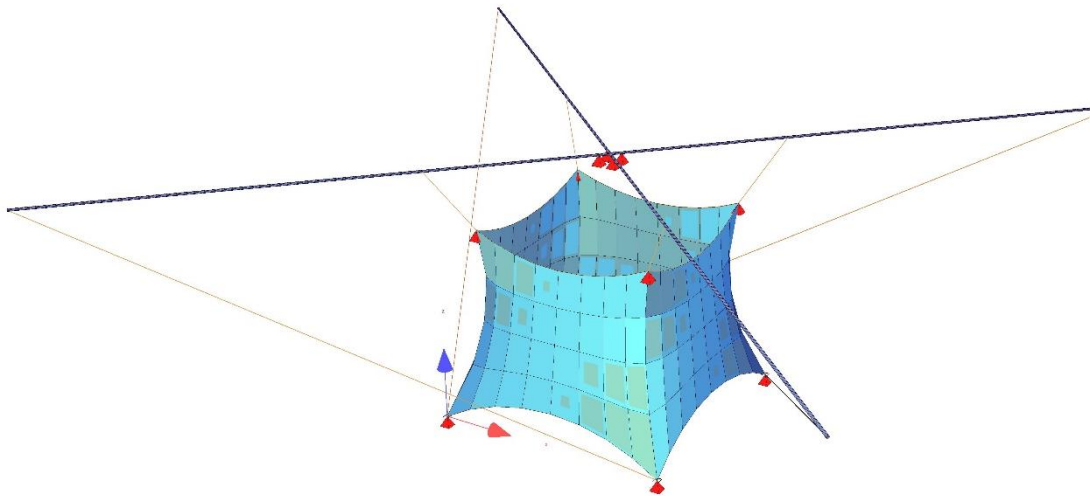
SUNDAY 24.09.2017 15:30 – 18:00

all

Tutorials Day 1: Mesh based FEM Sofistik

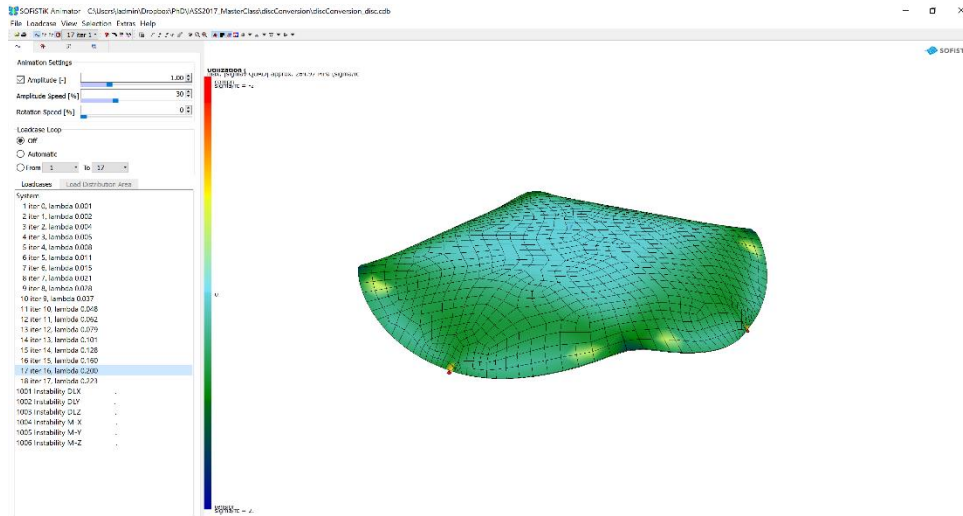


5P Sail with GFRP rod

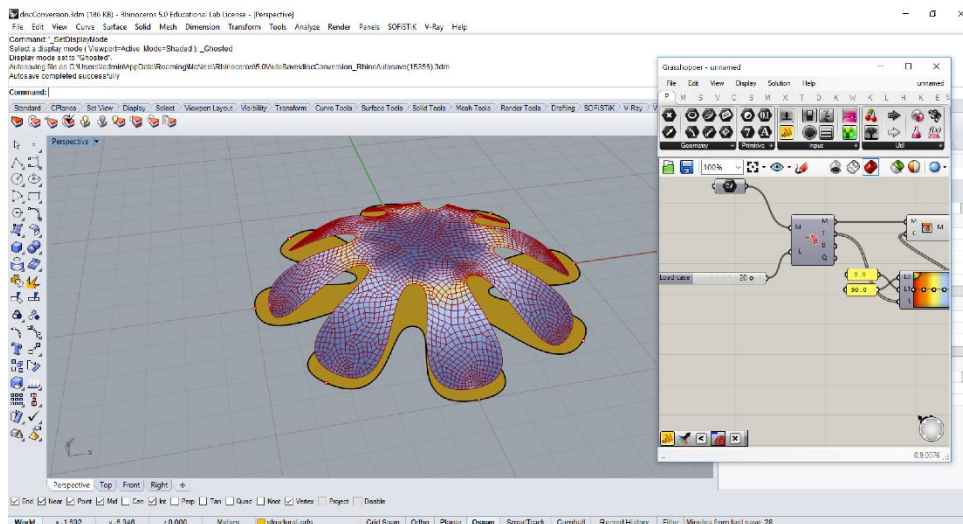


Complex textile hybrid

Tutorials Day 1: Mesh based FEM Sofistik

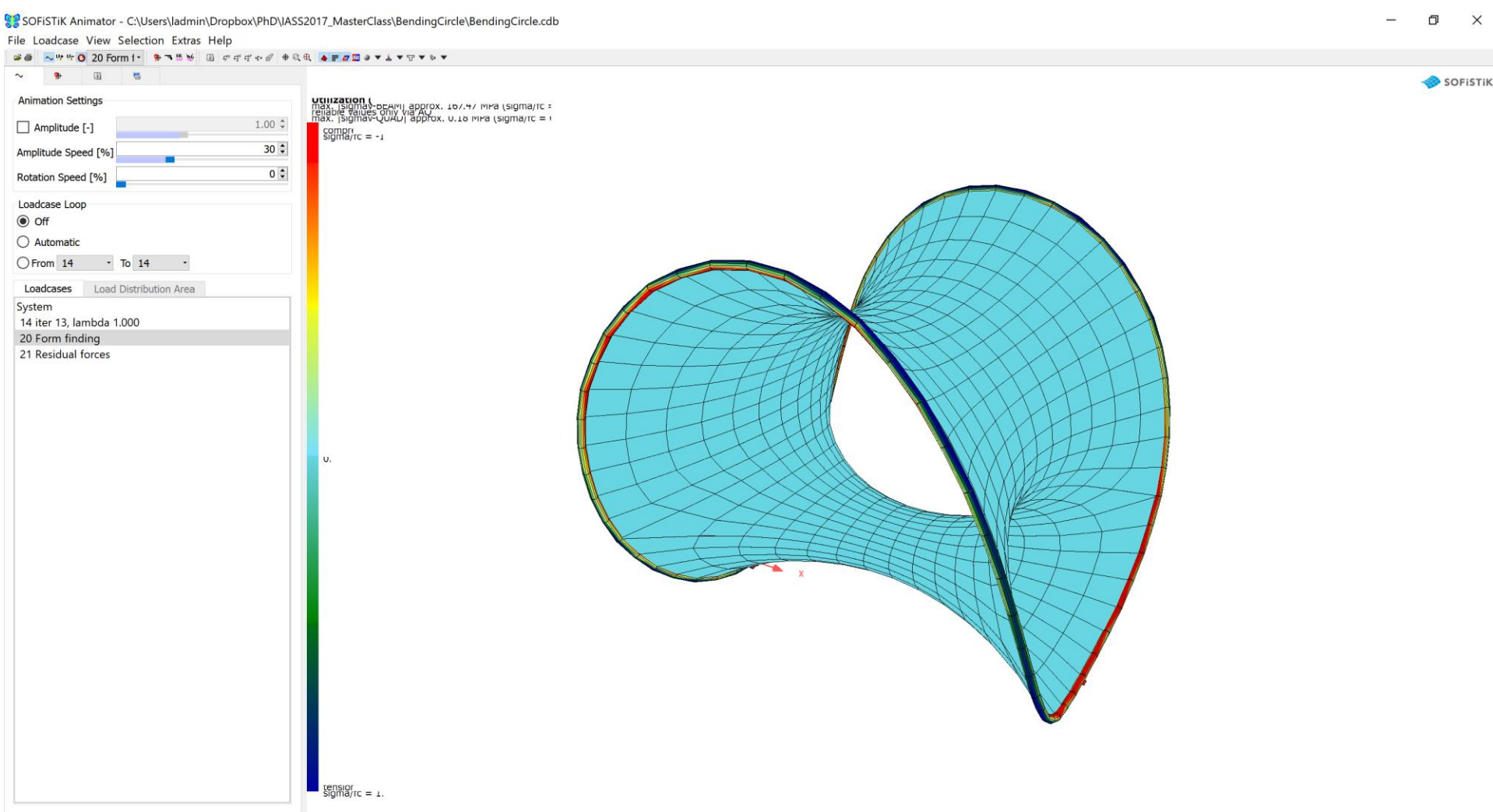


Bending Plates



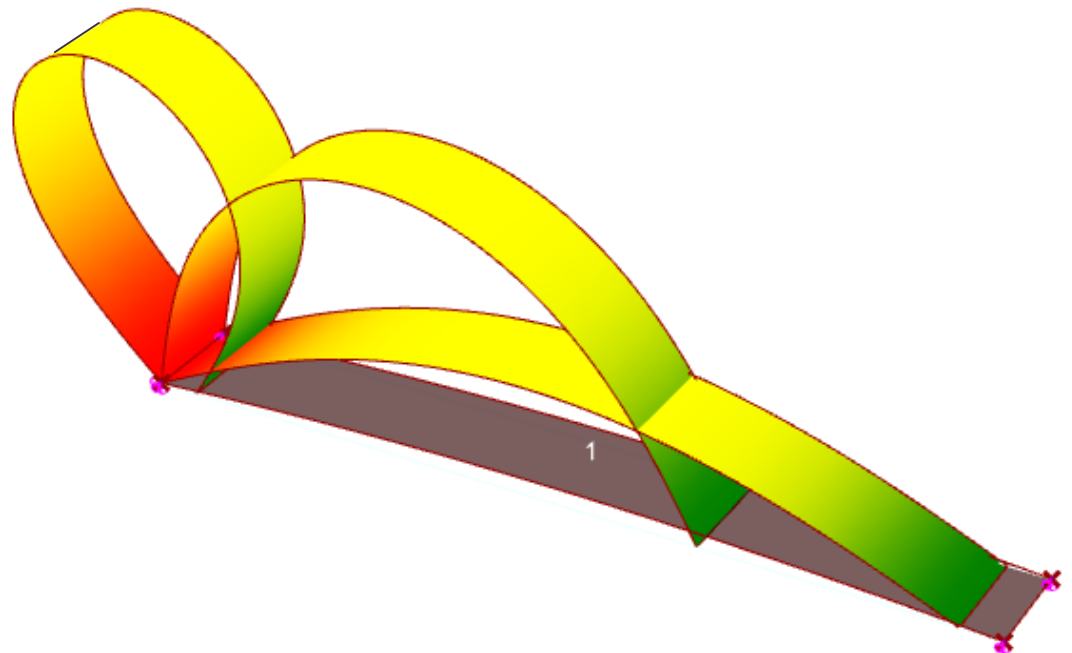
Bending Plates

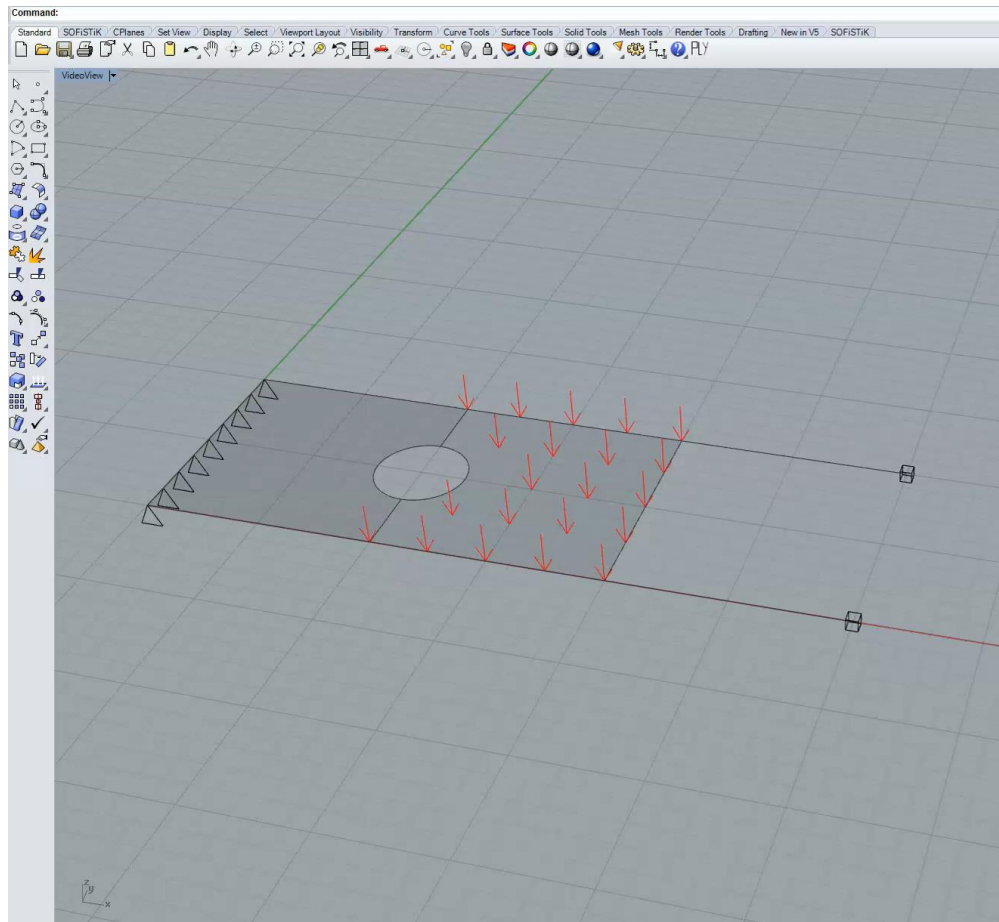
Tutorials Day 1: Mesh based FEM Sofistik

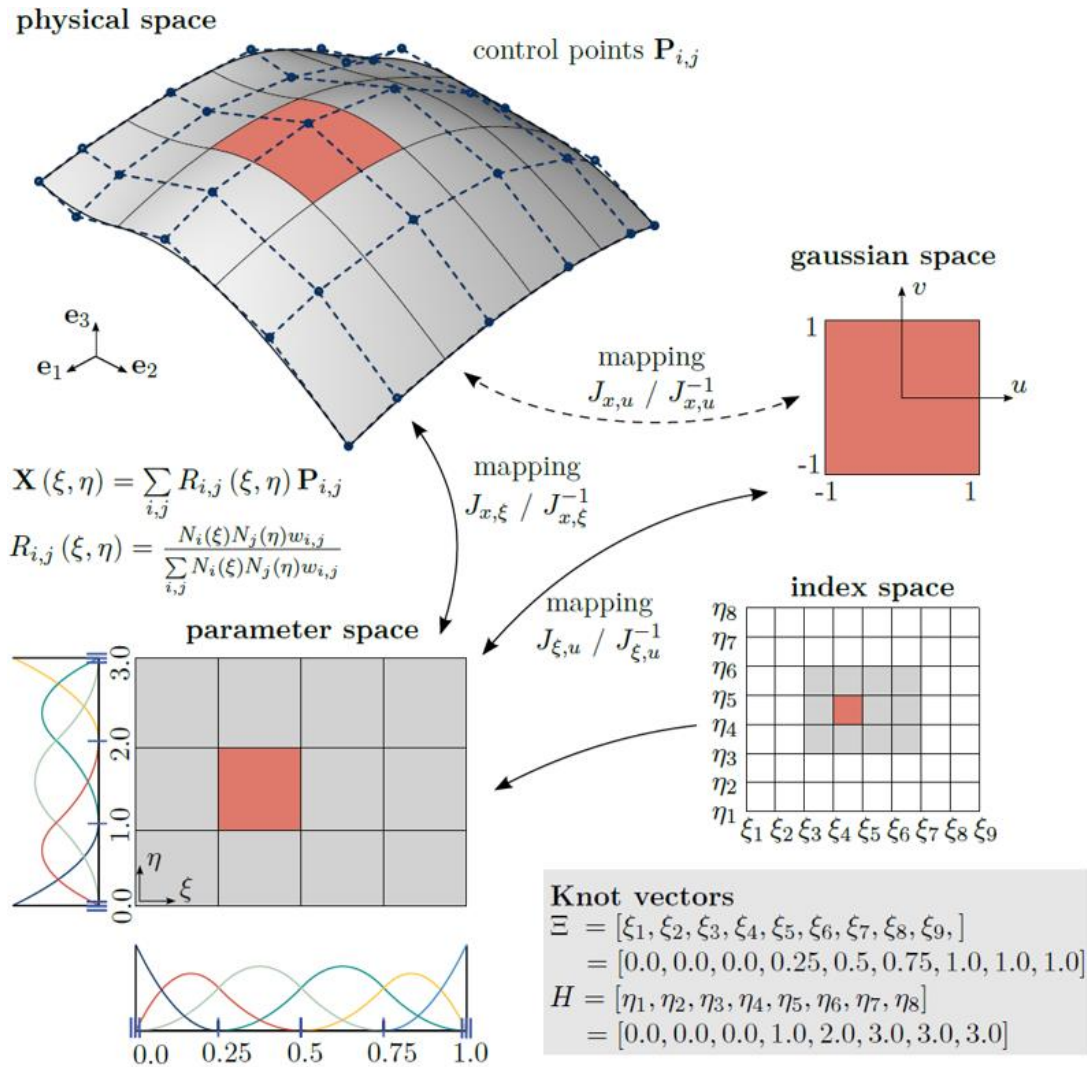


Bending with IGA

using Kiwi3d

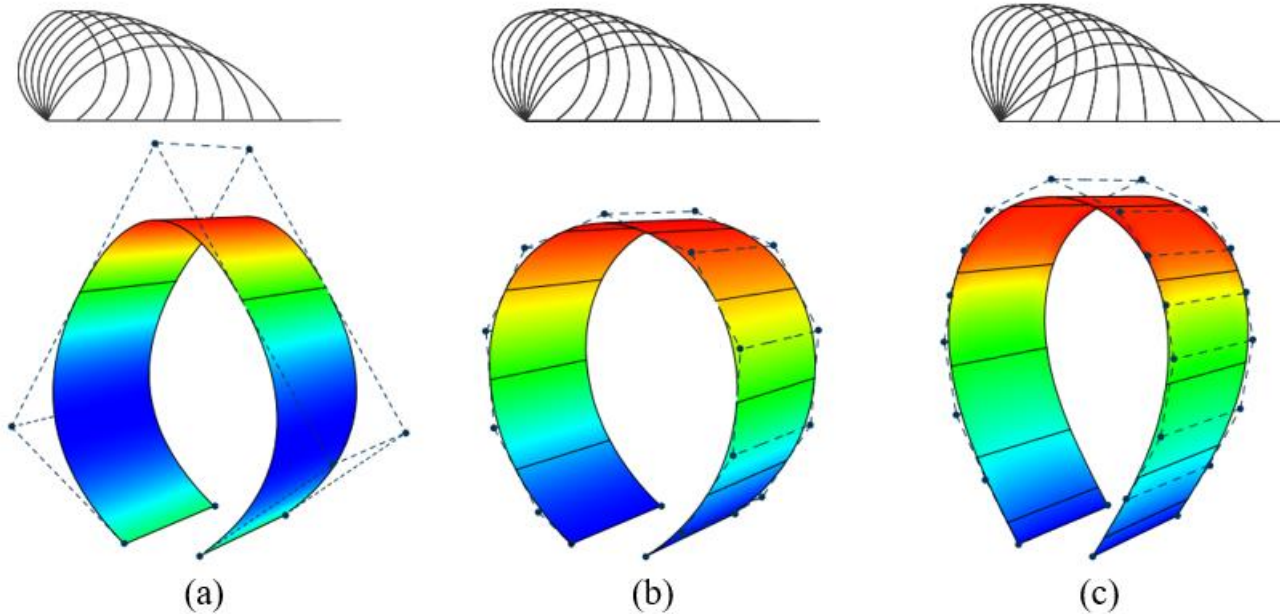






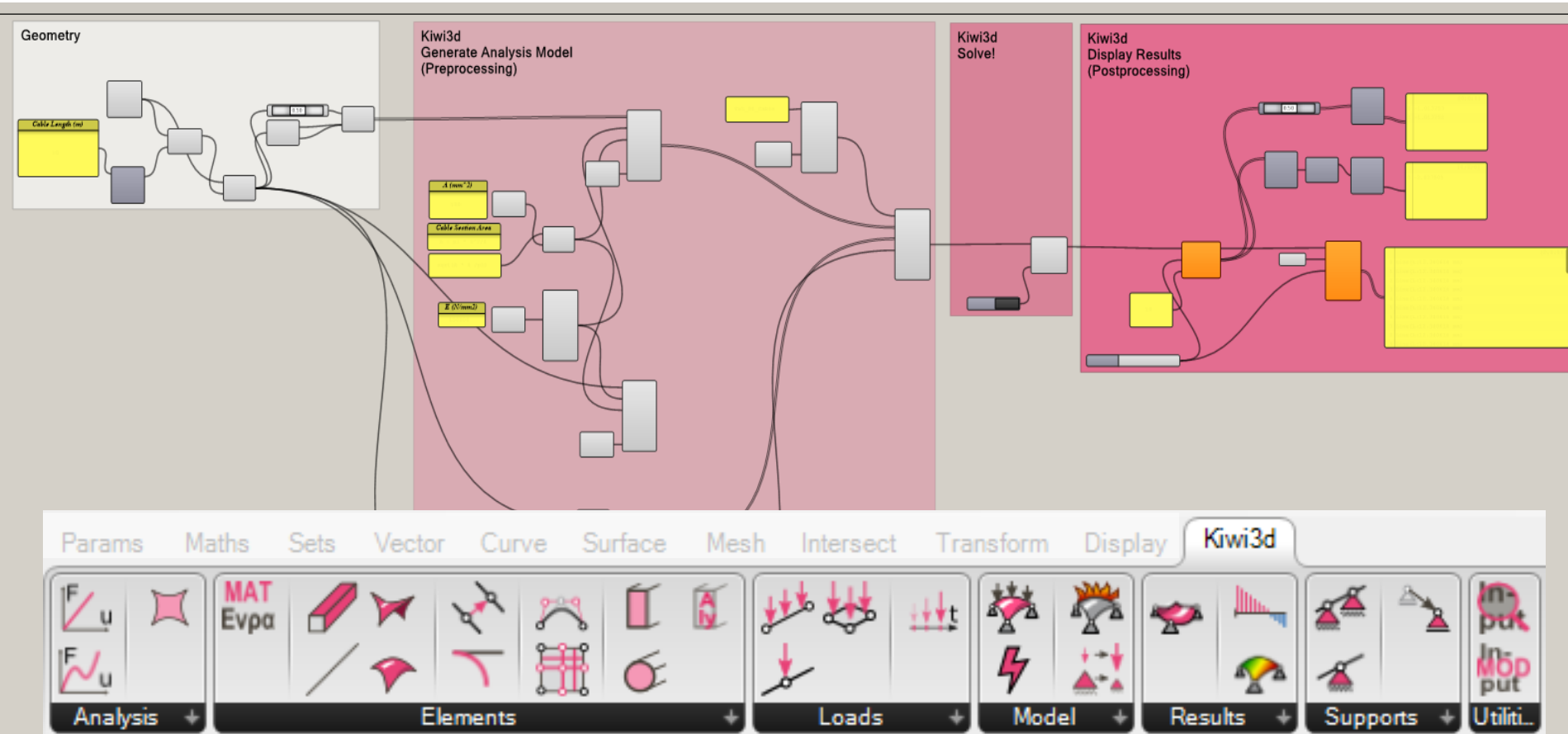
Analysis Suitable Modeling

- Mesh assessment



Kiwi3d

Setup a Model:



Tutorials Day 2: Nurbs based IGA Carat++

5-Point Sail with Beam

Formfinding Steps: 10

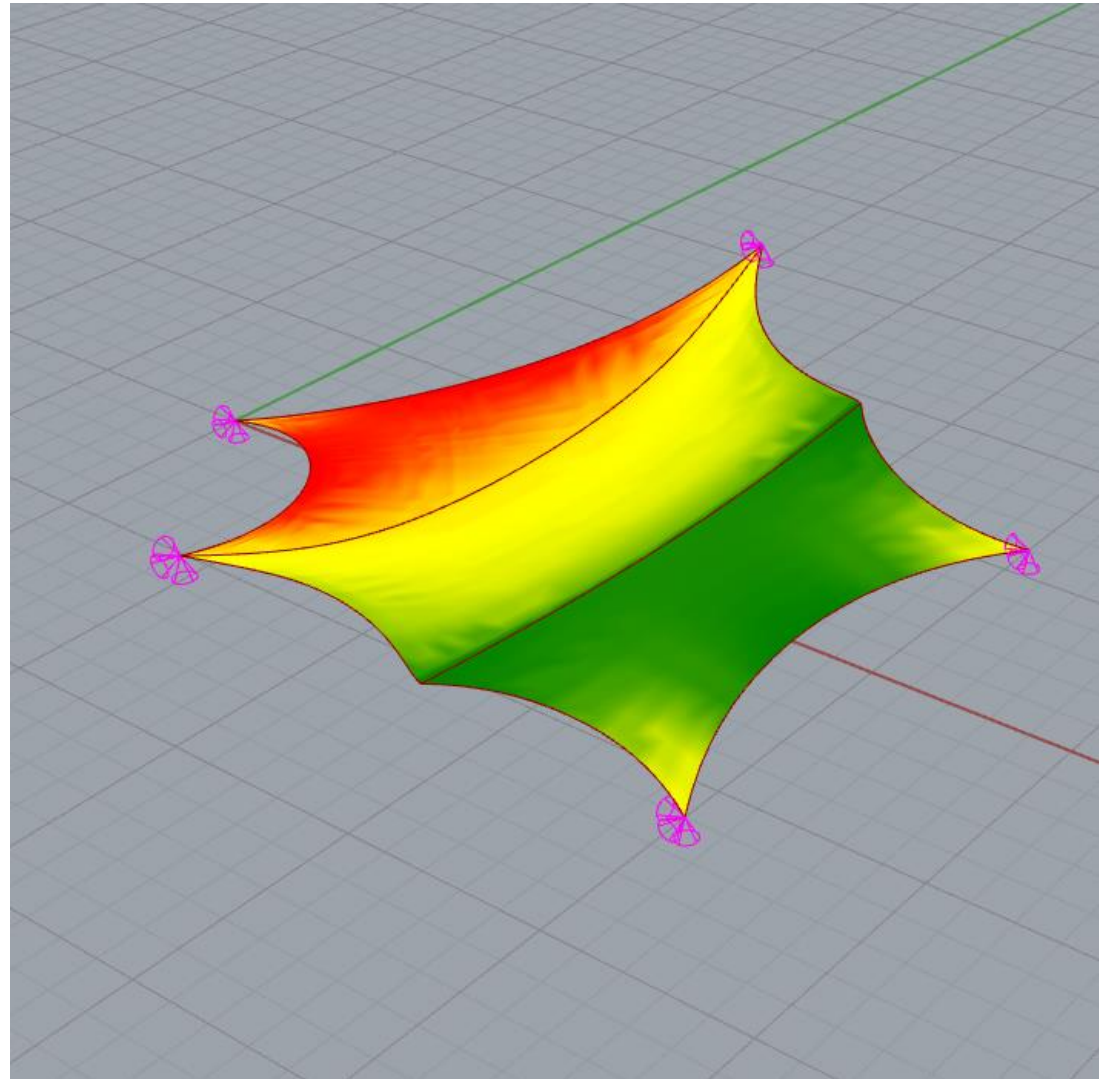
Membrane: $t = 0.001\text{m}$

Prestress: 0.1 kN/m^2

Cable: $D = 0.01\text{m}$

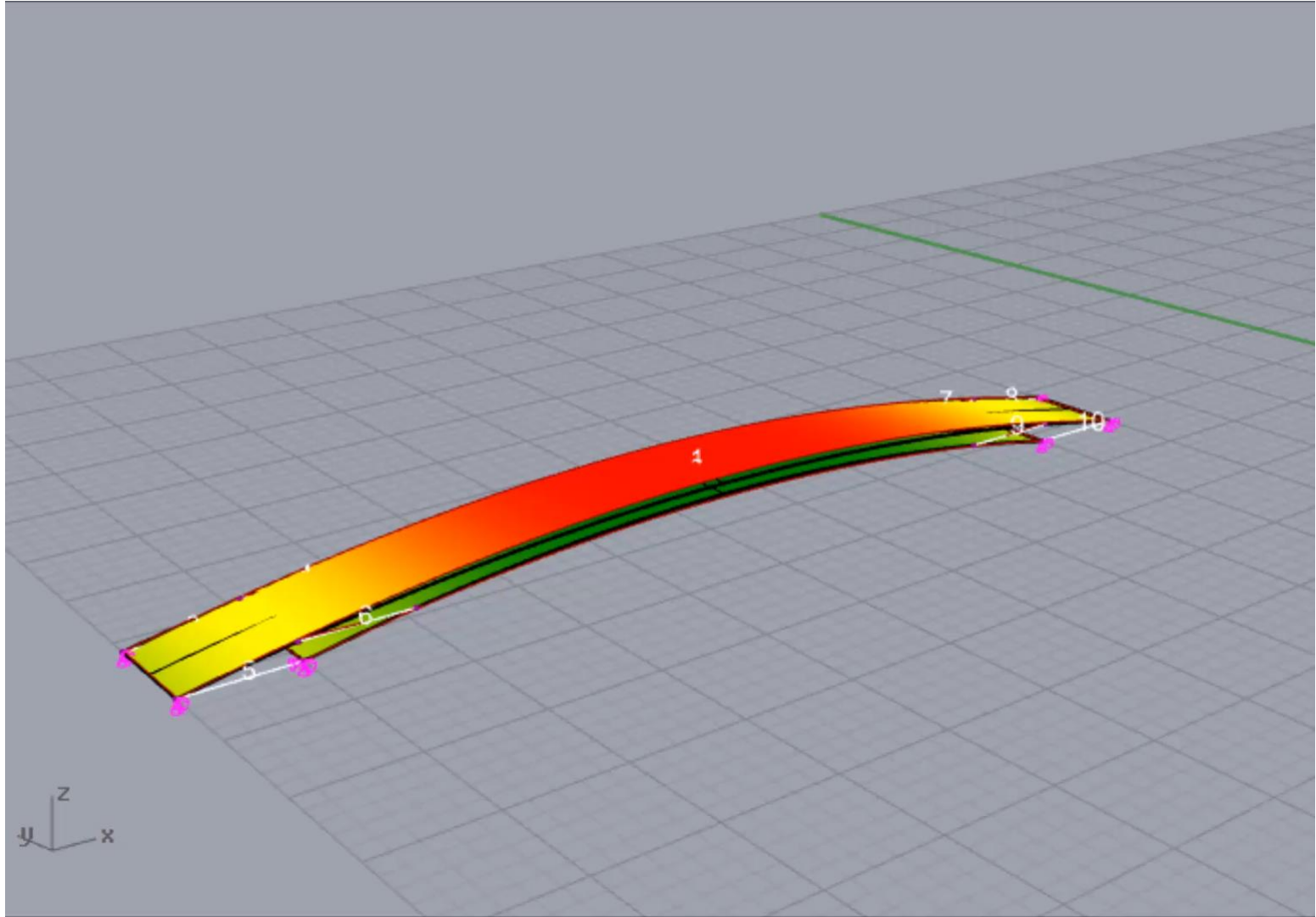
Prestress: 15kN

Beam: $D = 0.007\text{m}$

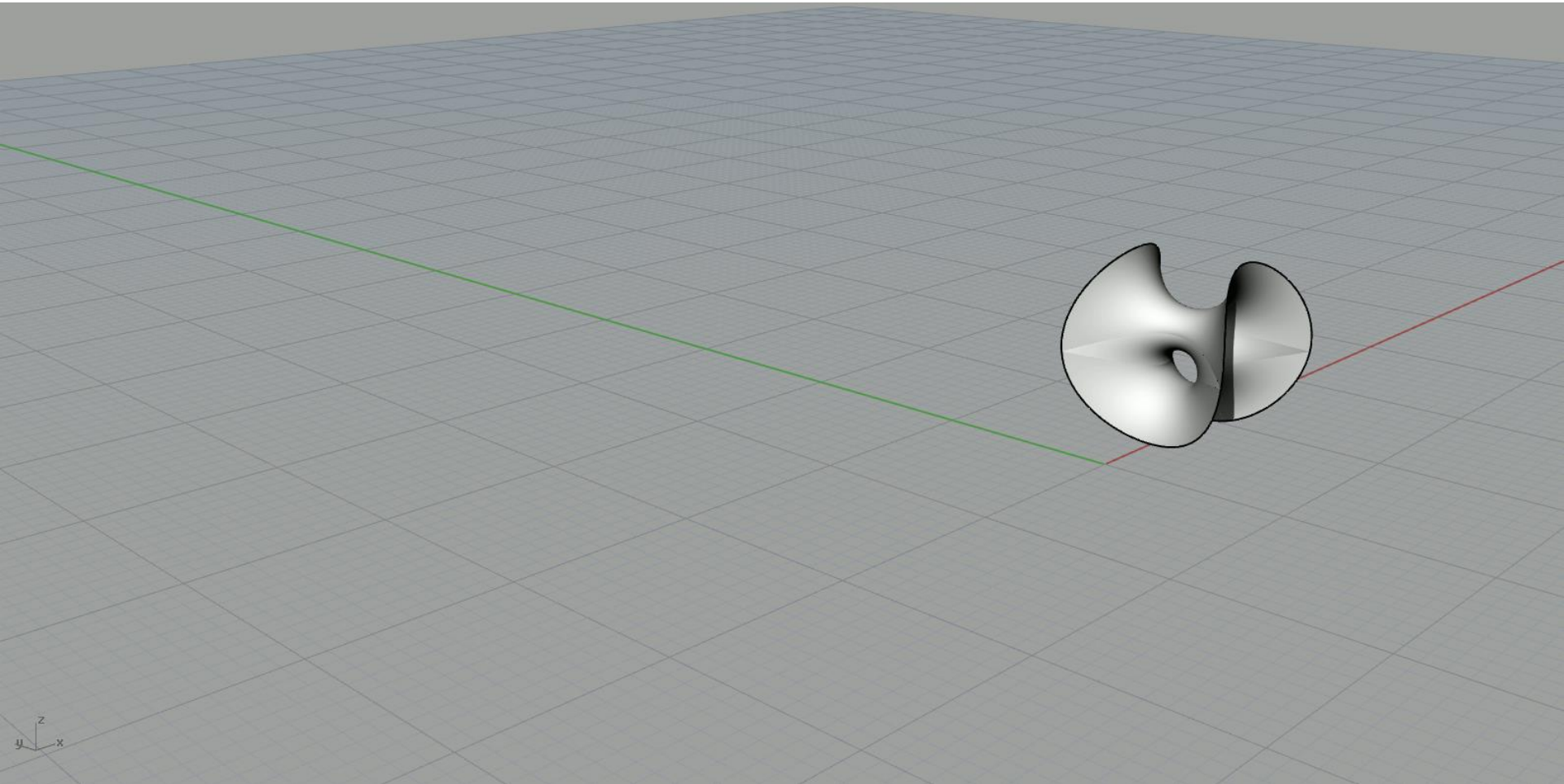


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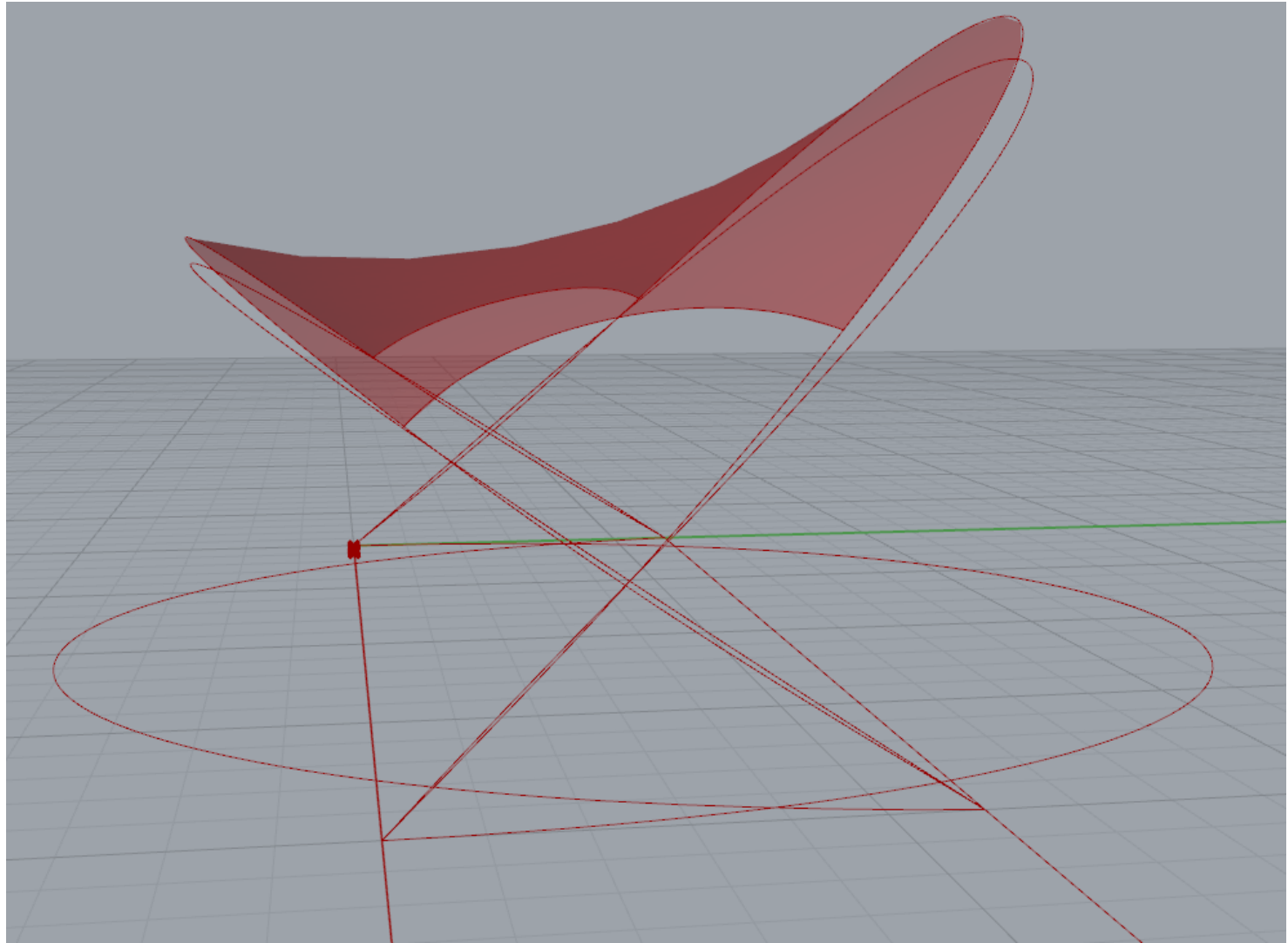
2 Strips



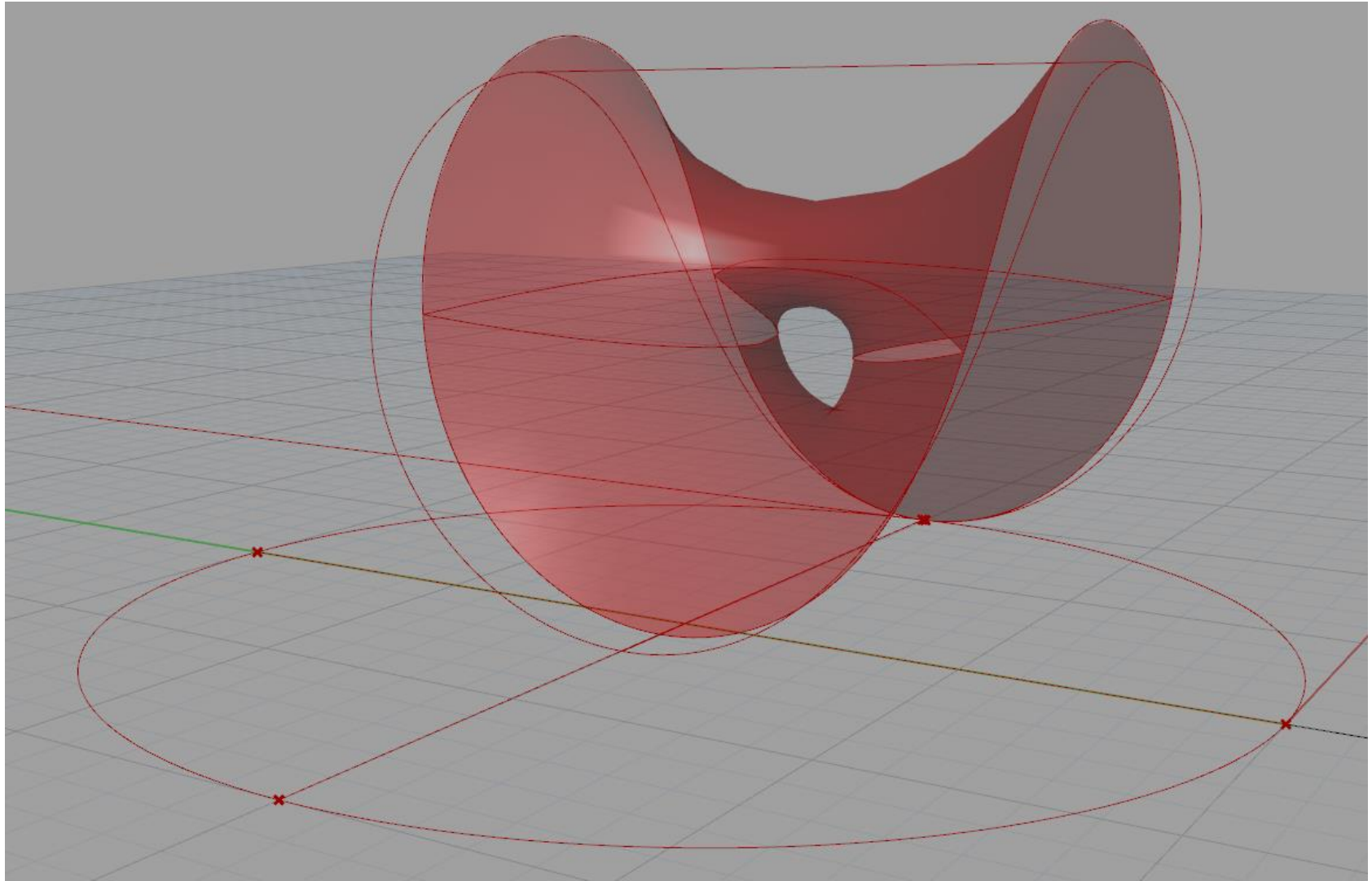
Tutorials Day 2: Nurbs based IGA Carat++



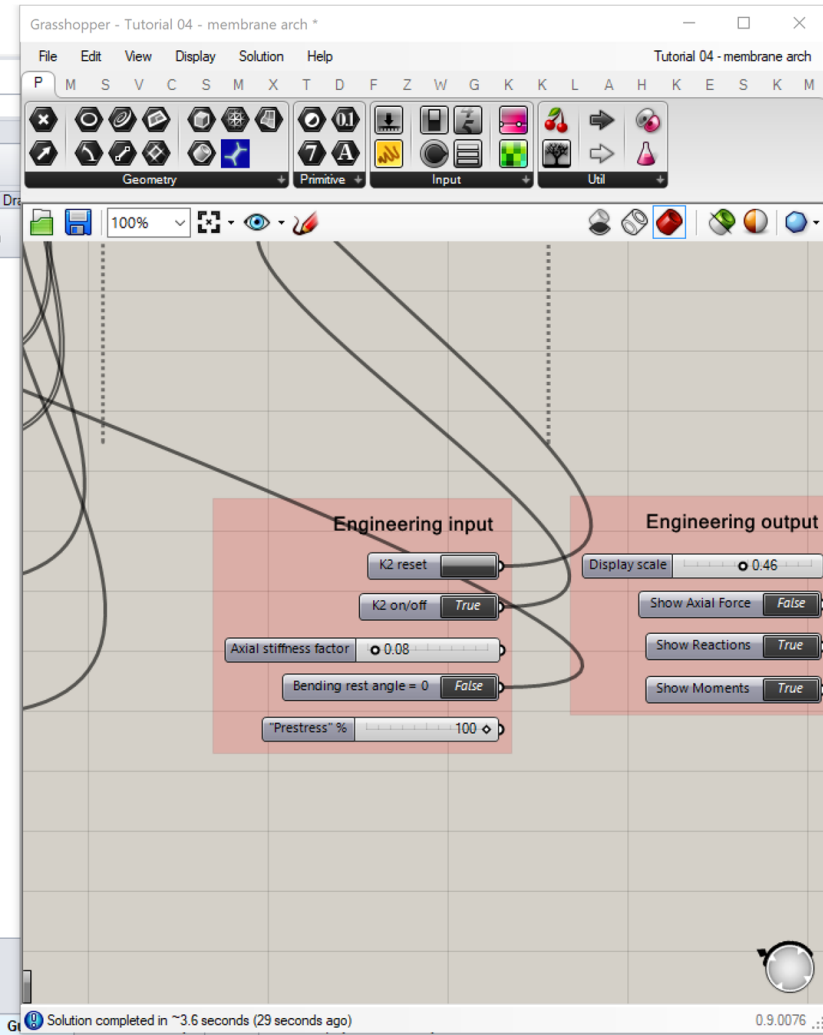
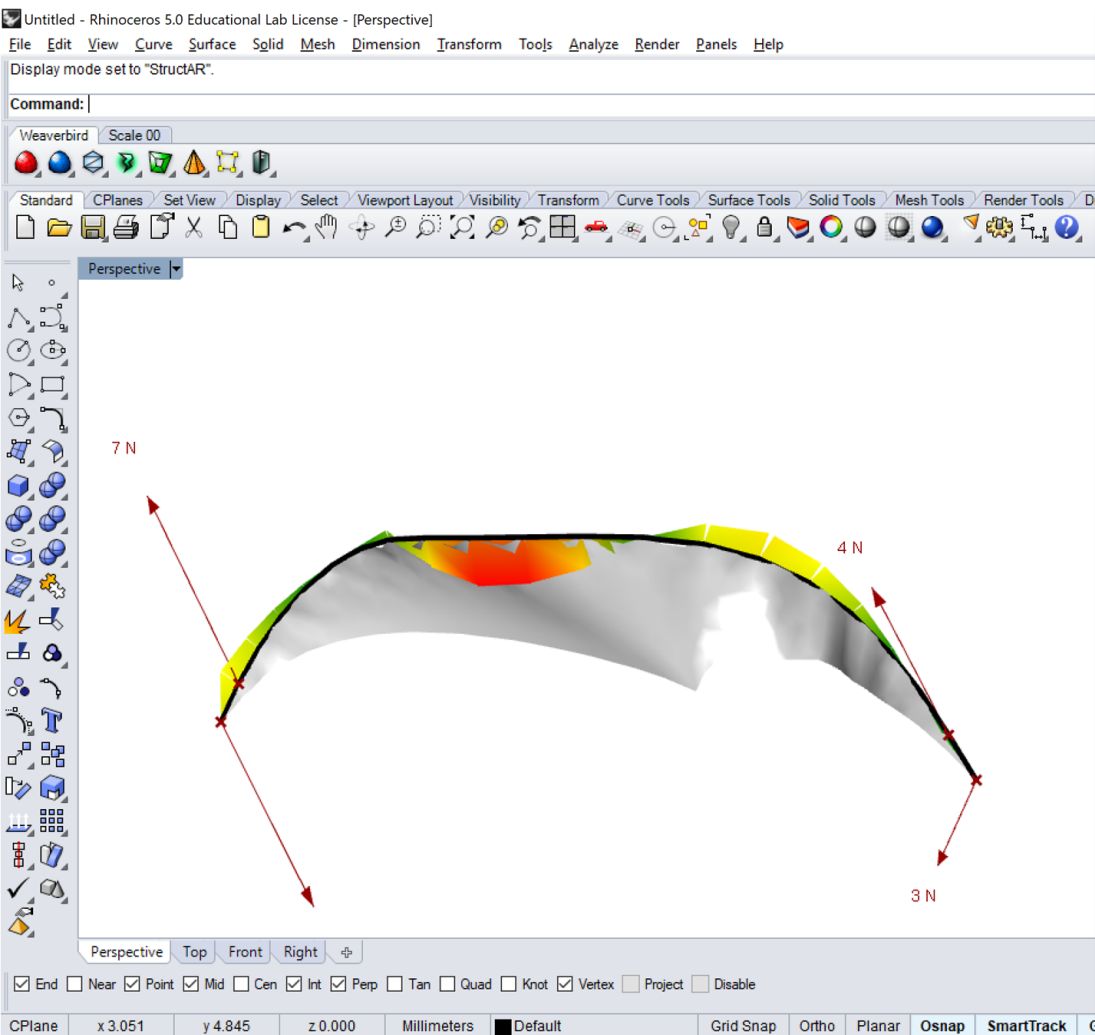
Tutorials Day 2: Nurbs based IGA Carat++



Tutorials Day 2: Nurbs based IGA Carat++



Tutorials Day 3: Vector based DR Kangaroo



Tutorials Day 3: Vector based DR Kangaroo

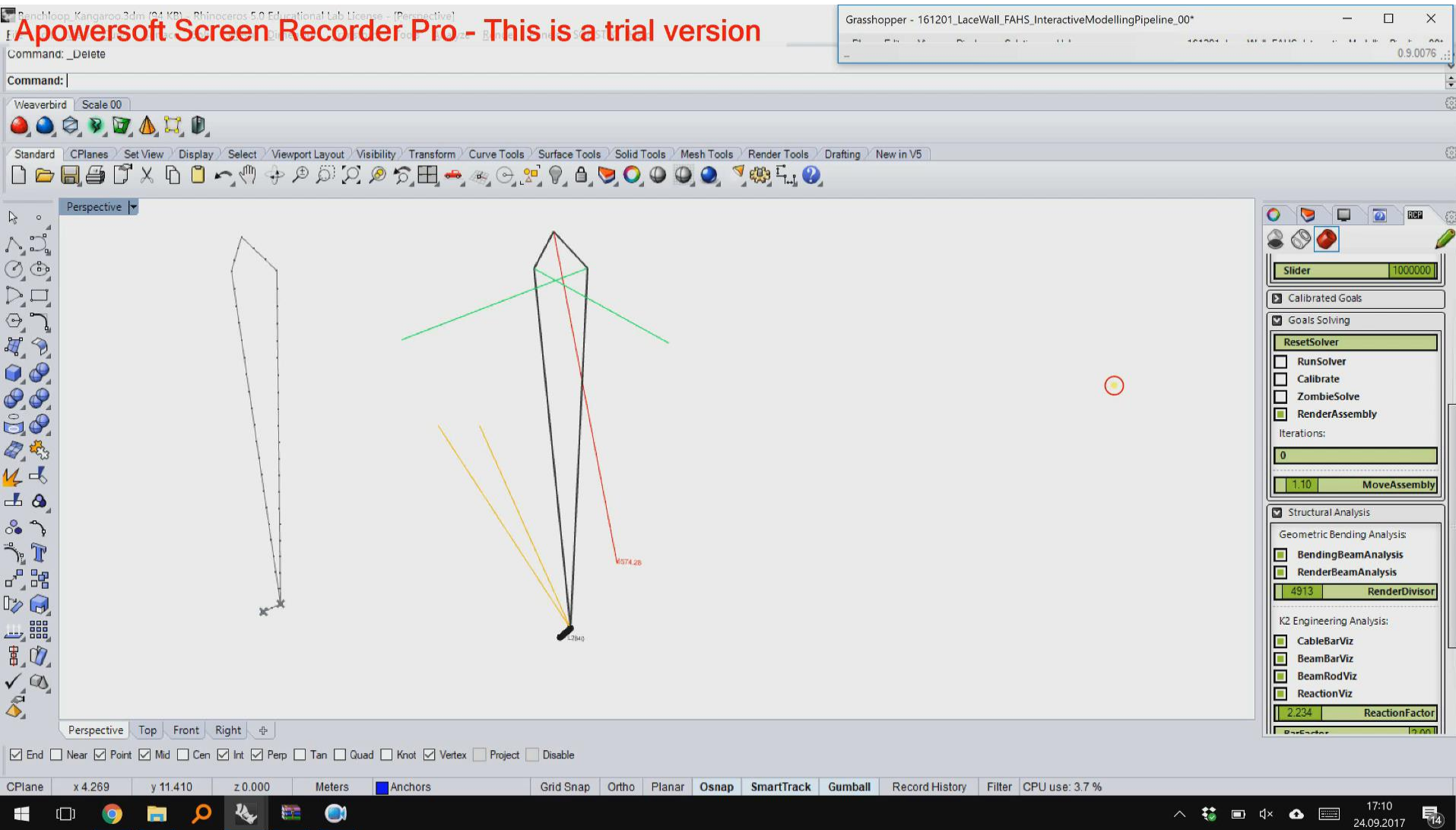
Script Editor

C# Script component: OnSurf

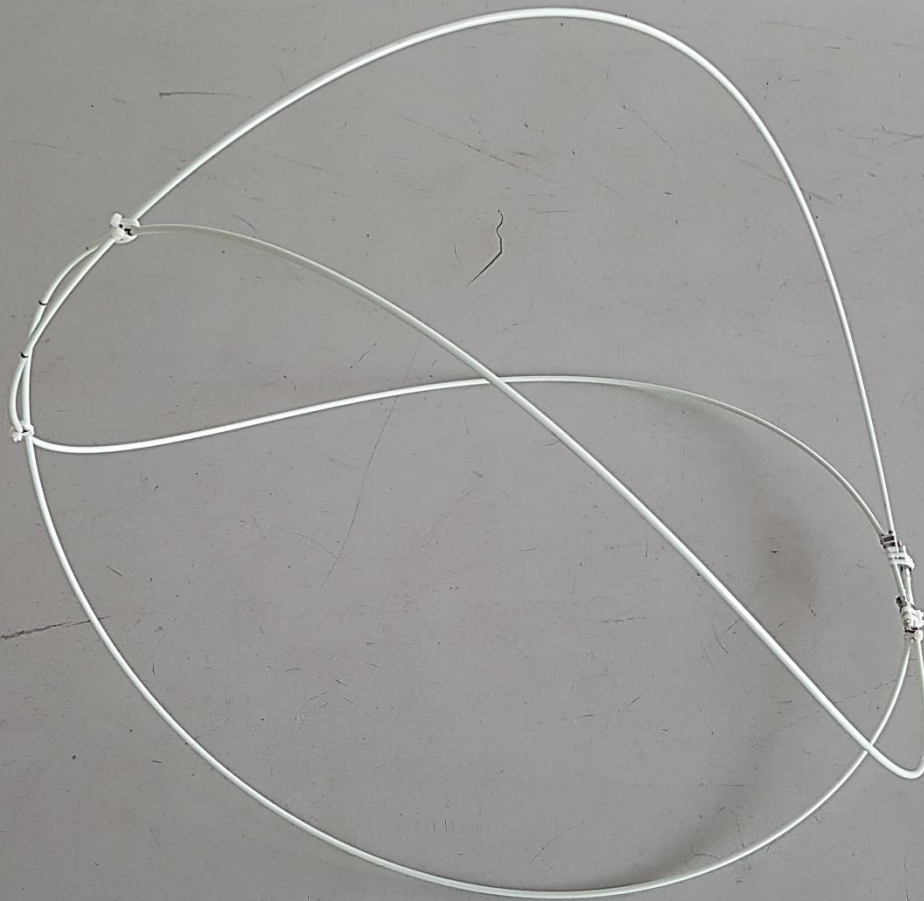
```
80
81 public class OnSurf : GoalObject
82 {
83     public double Strength;
84     public Brep TargetBrep;
85     // add here any other objects you want your goal to use
86
87     public OnSurf(Point3d P, double k, Brep Target)
88     {
89         PPos = new Point3d[1]{P};    // PPos must contain an array of the points this goal acts on
90         Move = new Vector3d[1];      // Move is an array of vectors, one for each PPos
91         Weighting = new double[1]{k}; // Weighting is an array of doubles for how strongly the goal affects ea
92         TargetBrep = Target;         // Any other data you want your goal to have access to
93     }
94
95     public override void Calculate(List<KangarooSolver.Particle> p)
96     {
97         Point3d ThisPt = p[PIndex[0]].Position;    //get the current position of the particle
98         Move[0] = TargetBrep.ClosestPoint(ThisPt) - ThisPt; //assign the goal vector moving this particle towa
99     }
100 }
101 /**/
102 }
```

Cache [Recover from cache](#) OK

Tutorials Day 3: Vector based DR Kangaroo



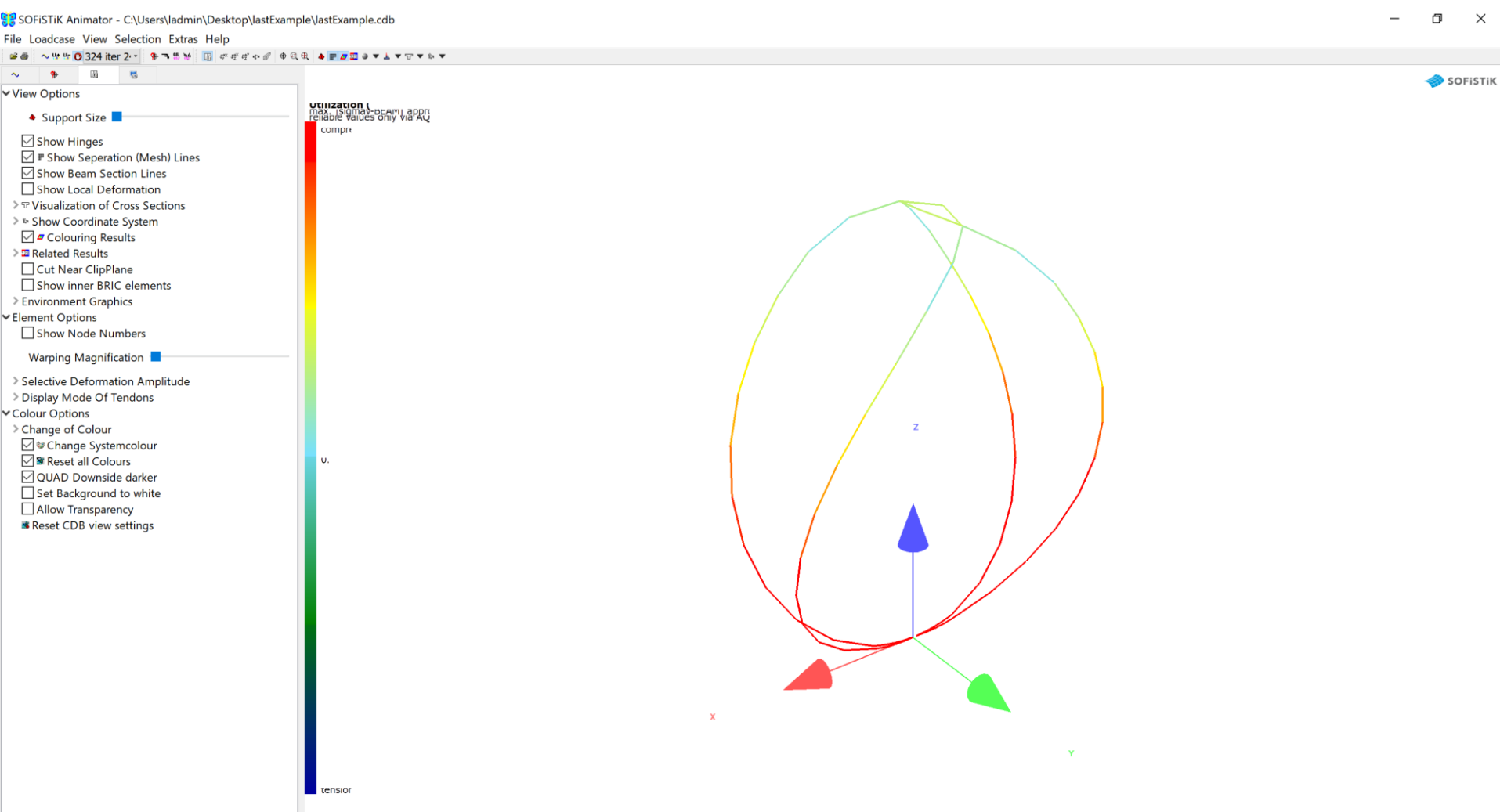
Benchmark: ONE challenge THREE teams



Benchmark: TEAM Sofistik



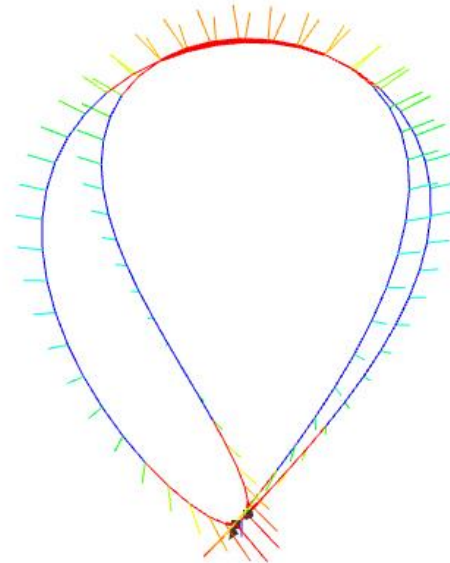
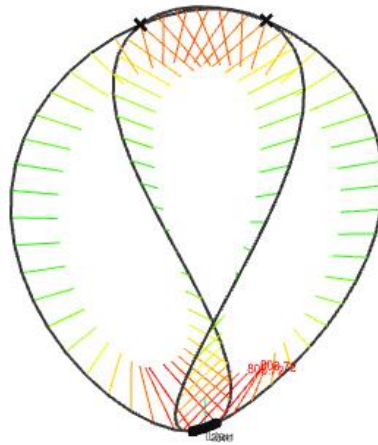
Benchmark: TEAM Sofistik



Benchmark: TEAM Kangaroo



Benchmark: TEAM Kangaroo



Benchmark: TEAM IGA Kiwi3D



Benchmark: TEAM IGA Kiwi3D

