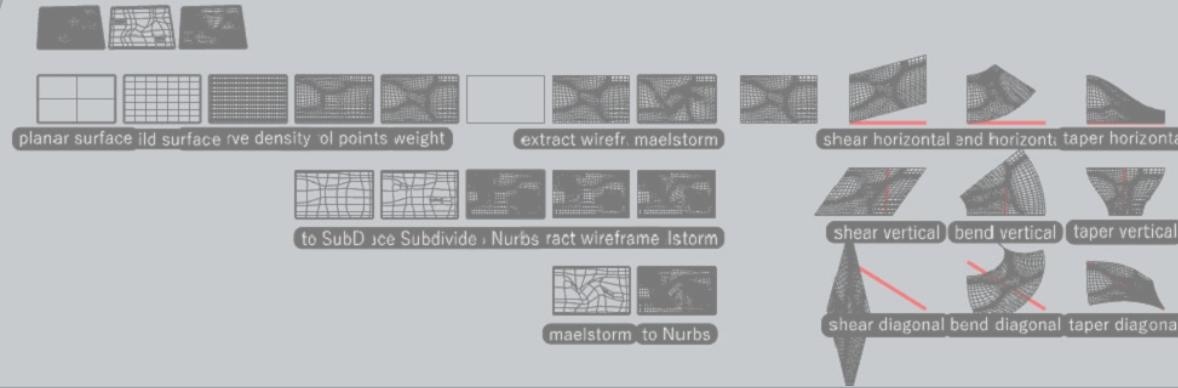


Diagram Modelling

Planar Surface
Rebuild Surface
Control Point Weight
Extract Wireframe
SubD
Maelstrom
Shear
Bend
Taper

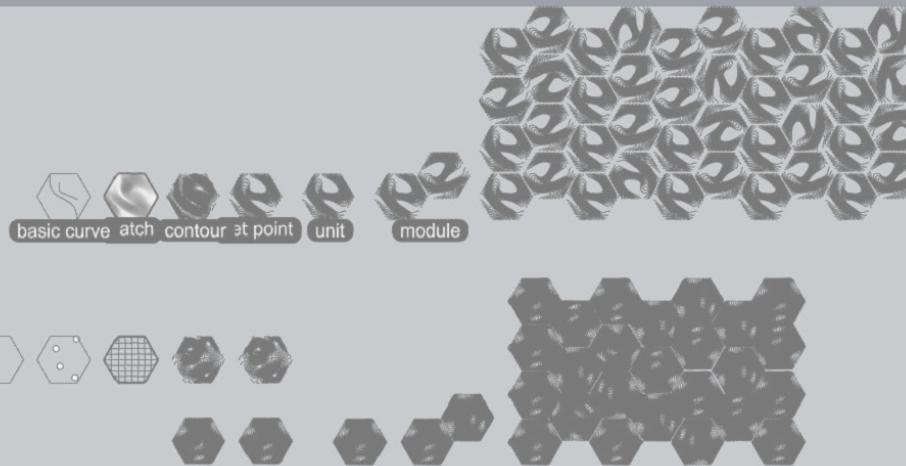
Network Grid

1



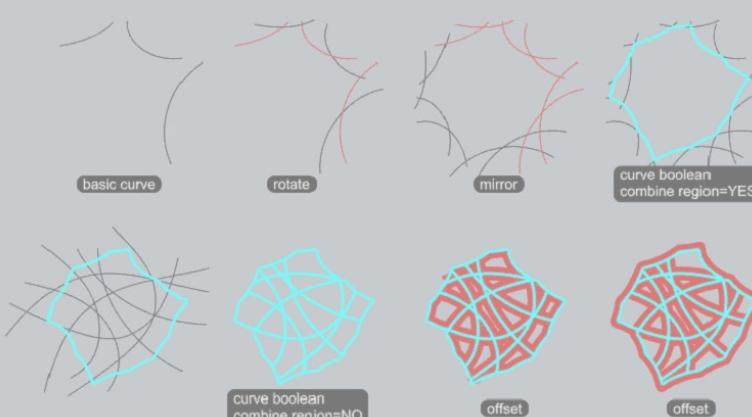
Polygon Curve
Patch
Contour
Set Point
Array
Gumball

2



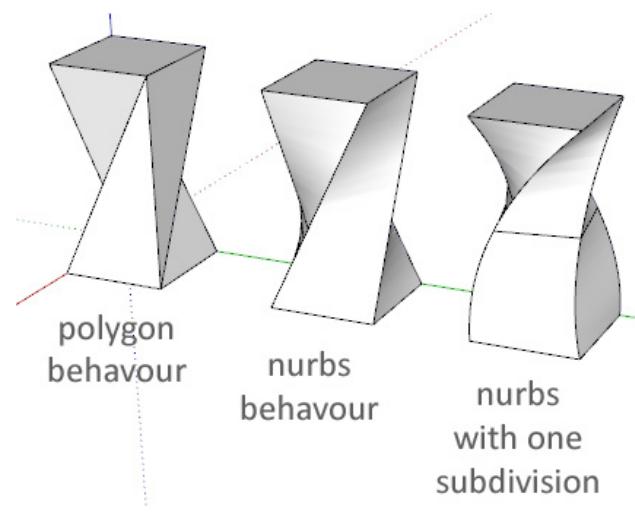
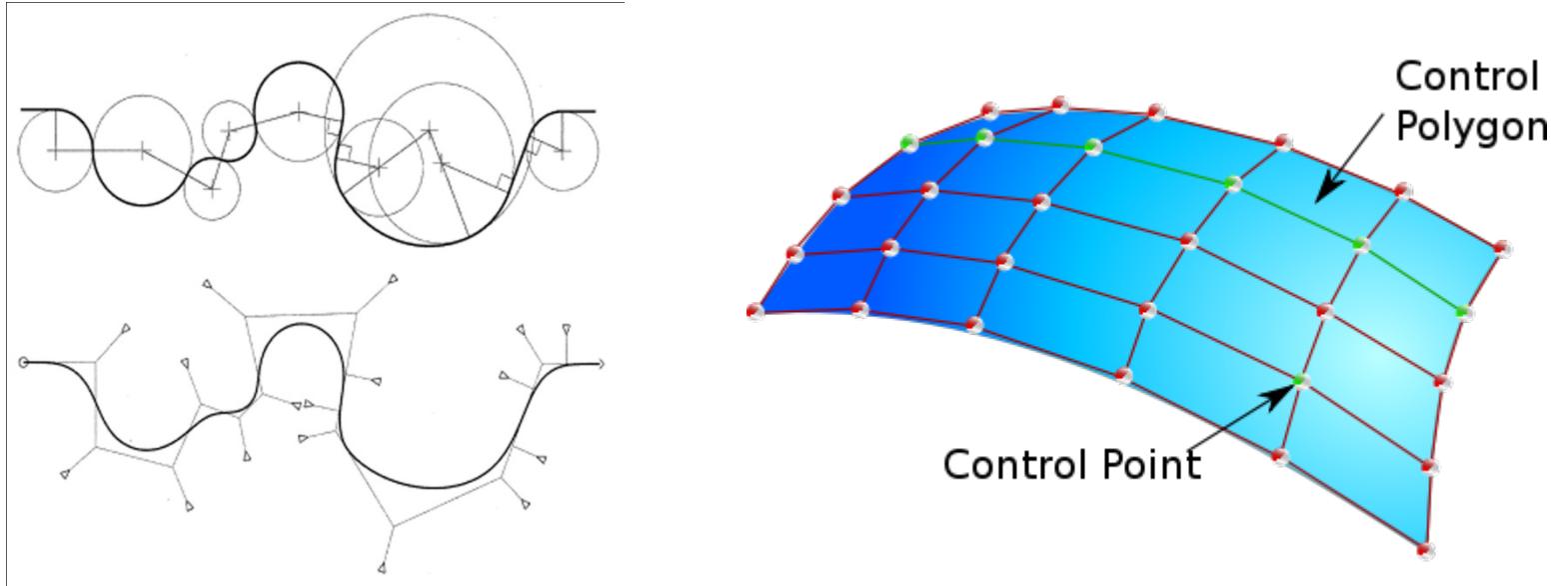
Morph Tile

?

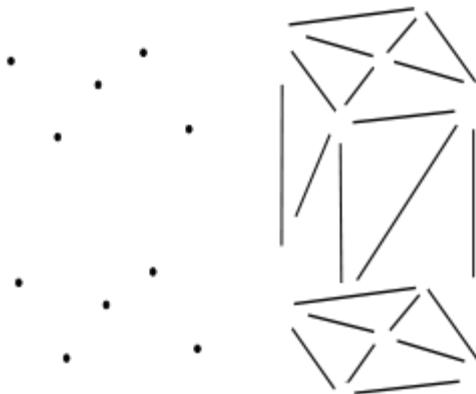


Curve
Rotate
Mirror
Curve Boolean
Offset
Grasshopper
GhPython

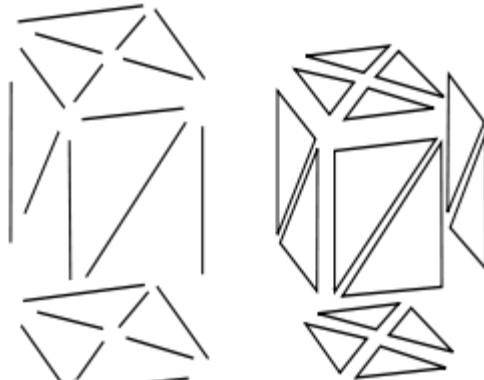
Multi Offset



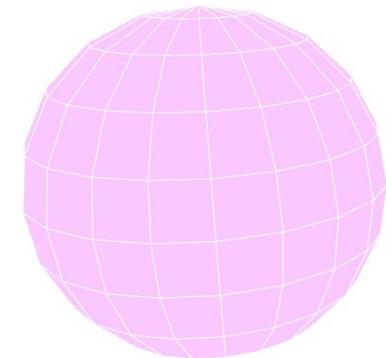
Descriptive Geometry
Non-Uniform Rational Basis Spline
Mesh



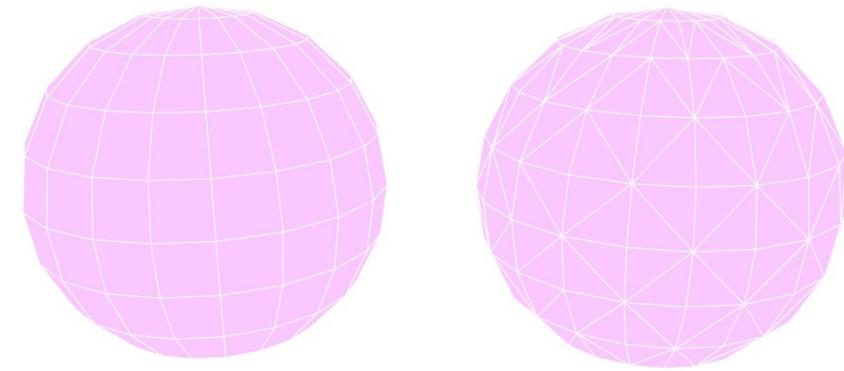
Mesh Vertices



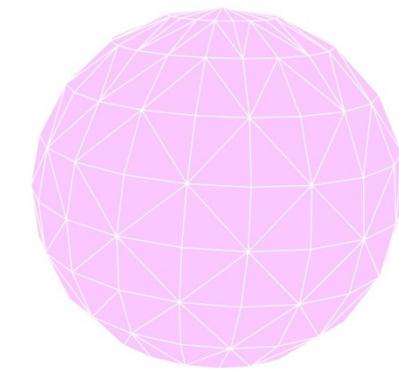
Mesh Edges



Mesh Faces



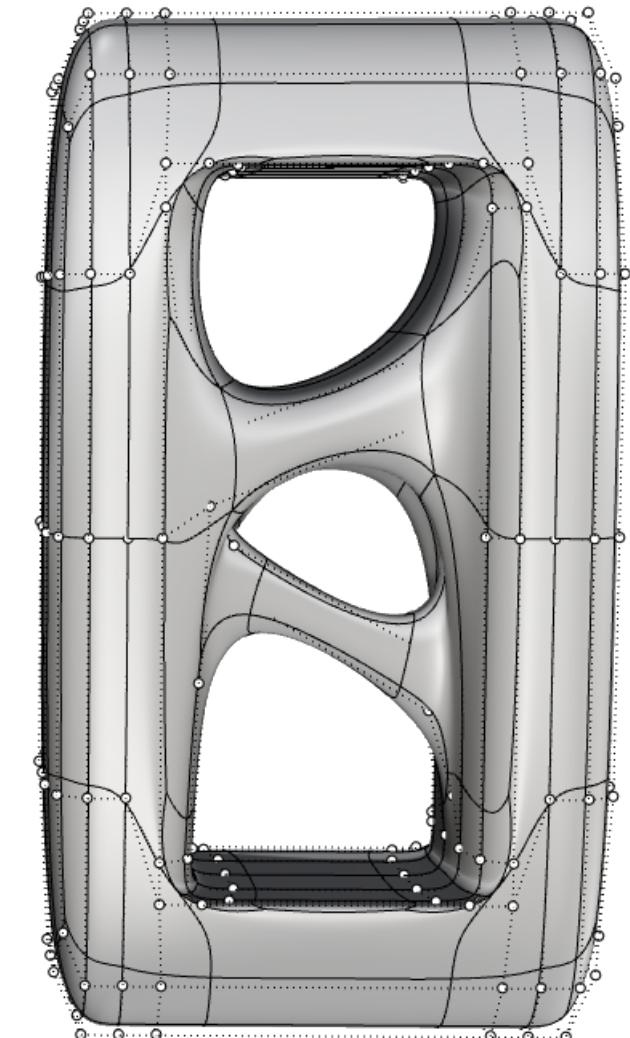
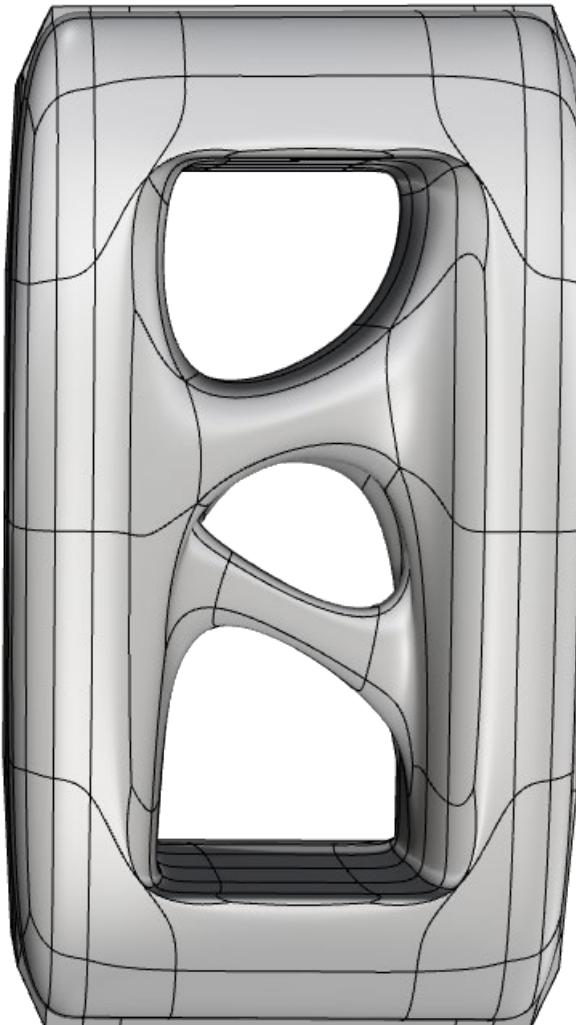
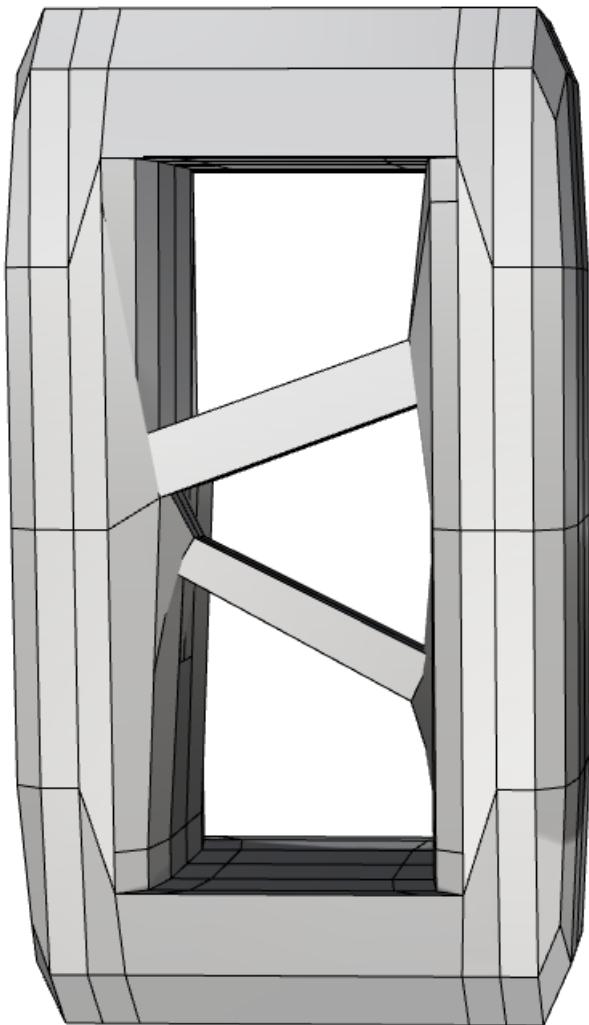
Mesh Quads



Mesh Triangles



MESH

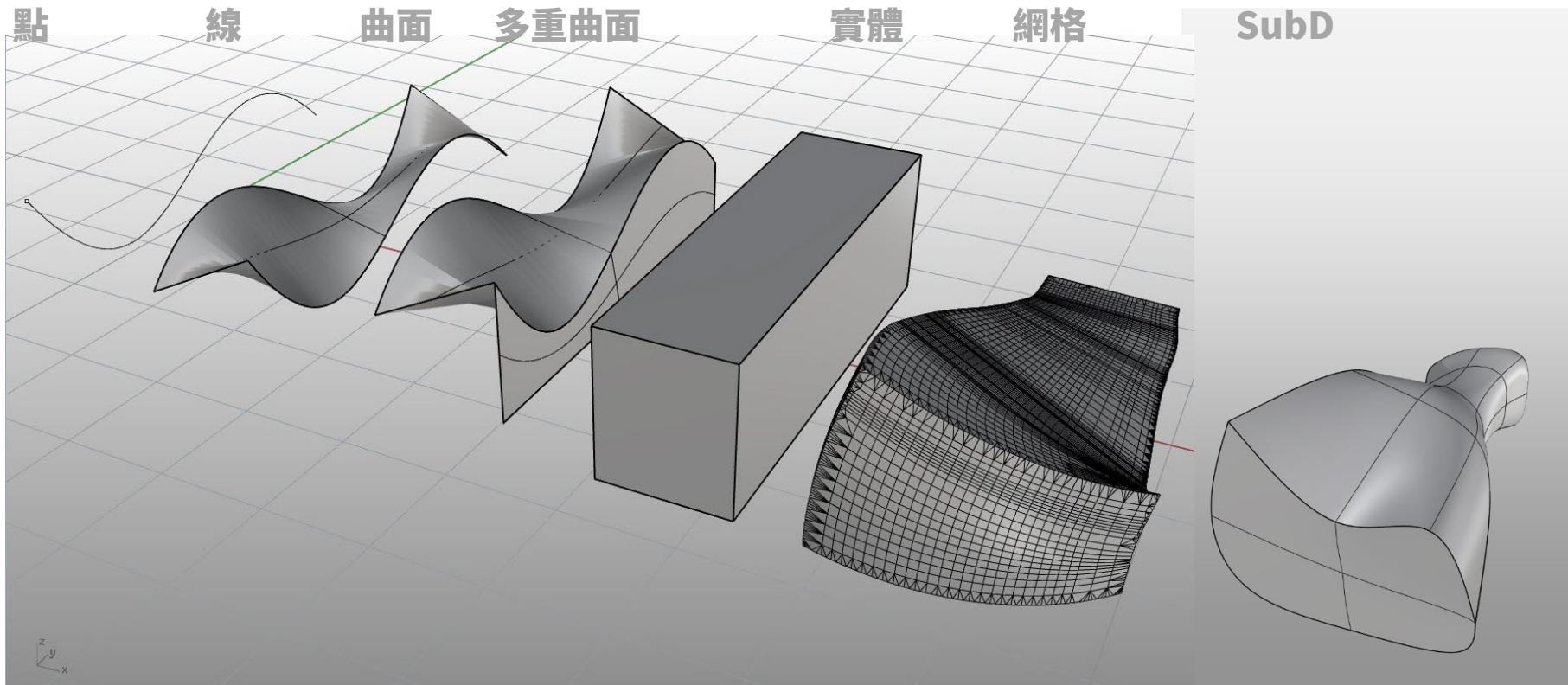


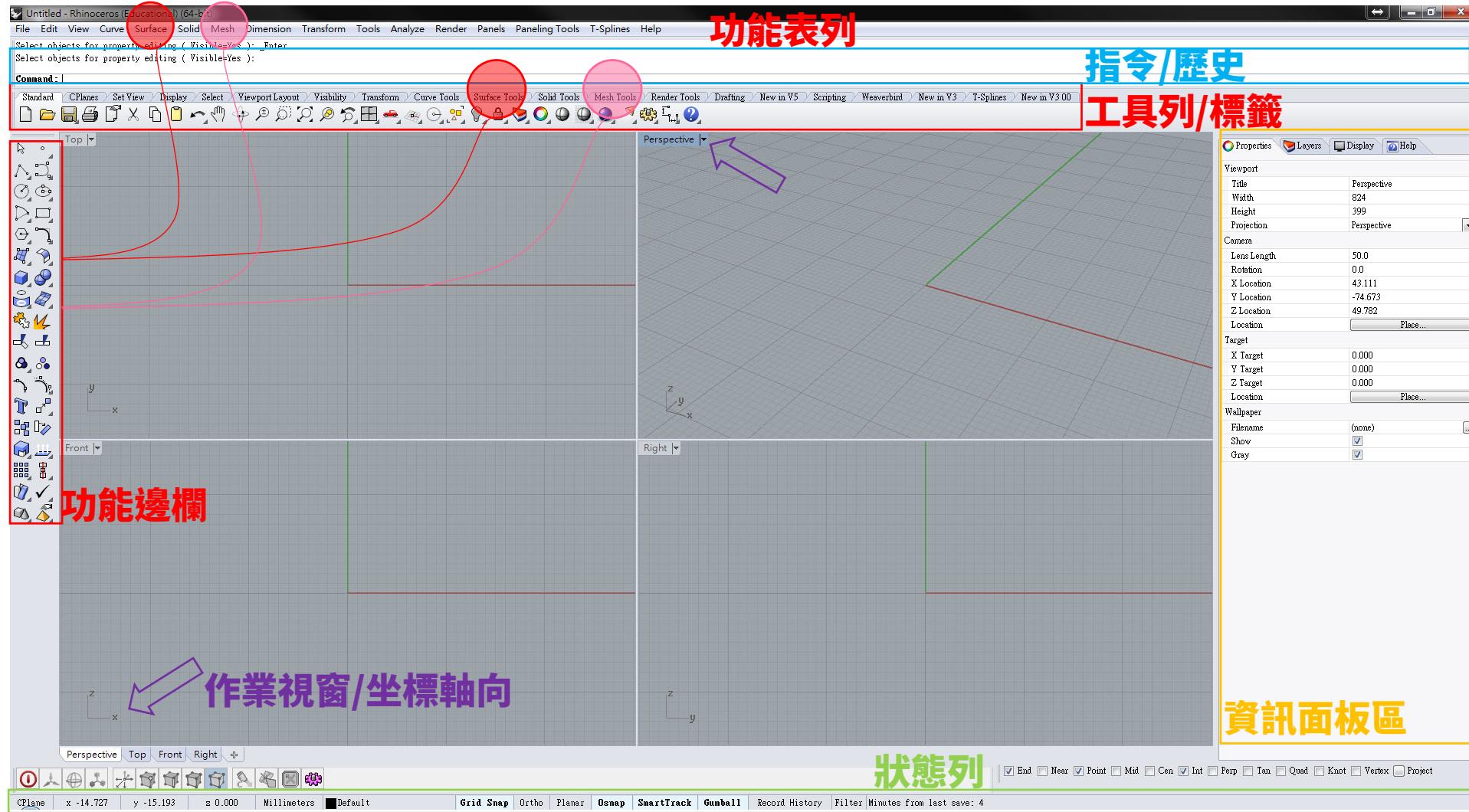
SubD

Rhinoceros_01
UI & 2D

Rhinoceros Object Type

Point
Curve
Surface
Polysurface
Solid
Mesh
SubD





User Interface



點 **Point**

線 **Line/Curve**
NURBS Curve

曲面 **Surface**

實體 **Solid**

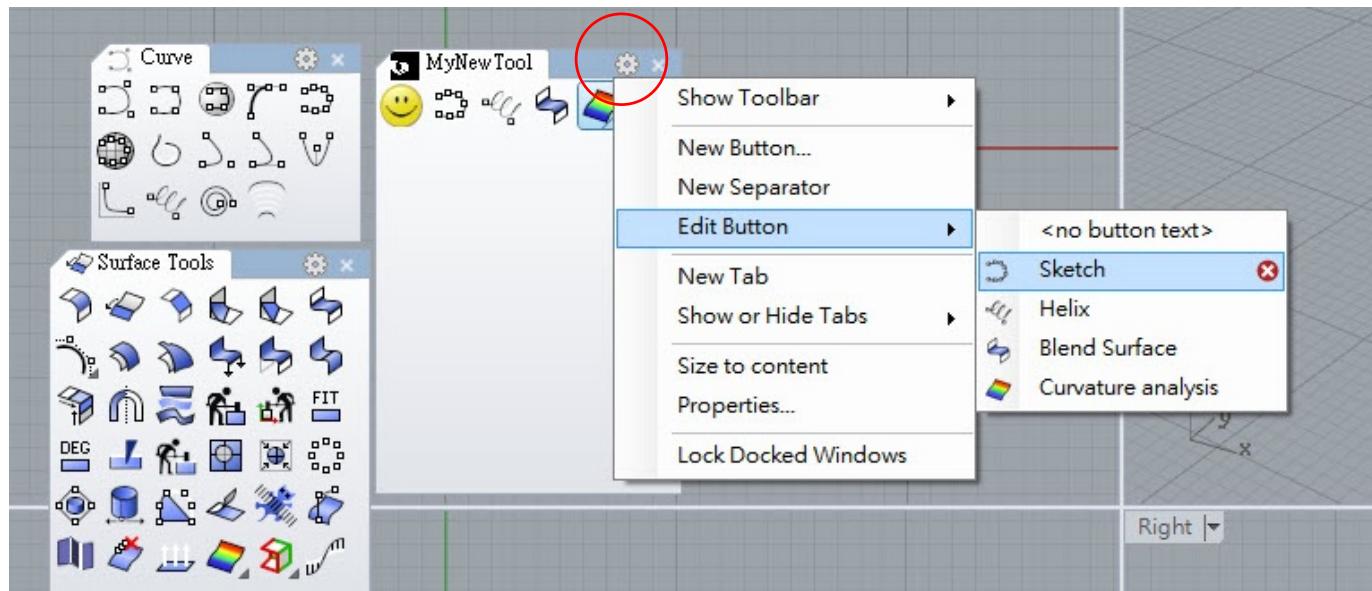
網格 **Mesh**

編輯

修改

分析

MyNewToolBar

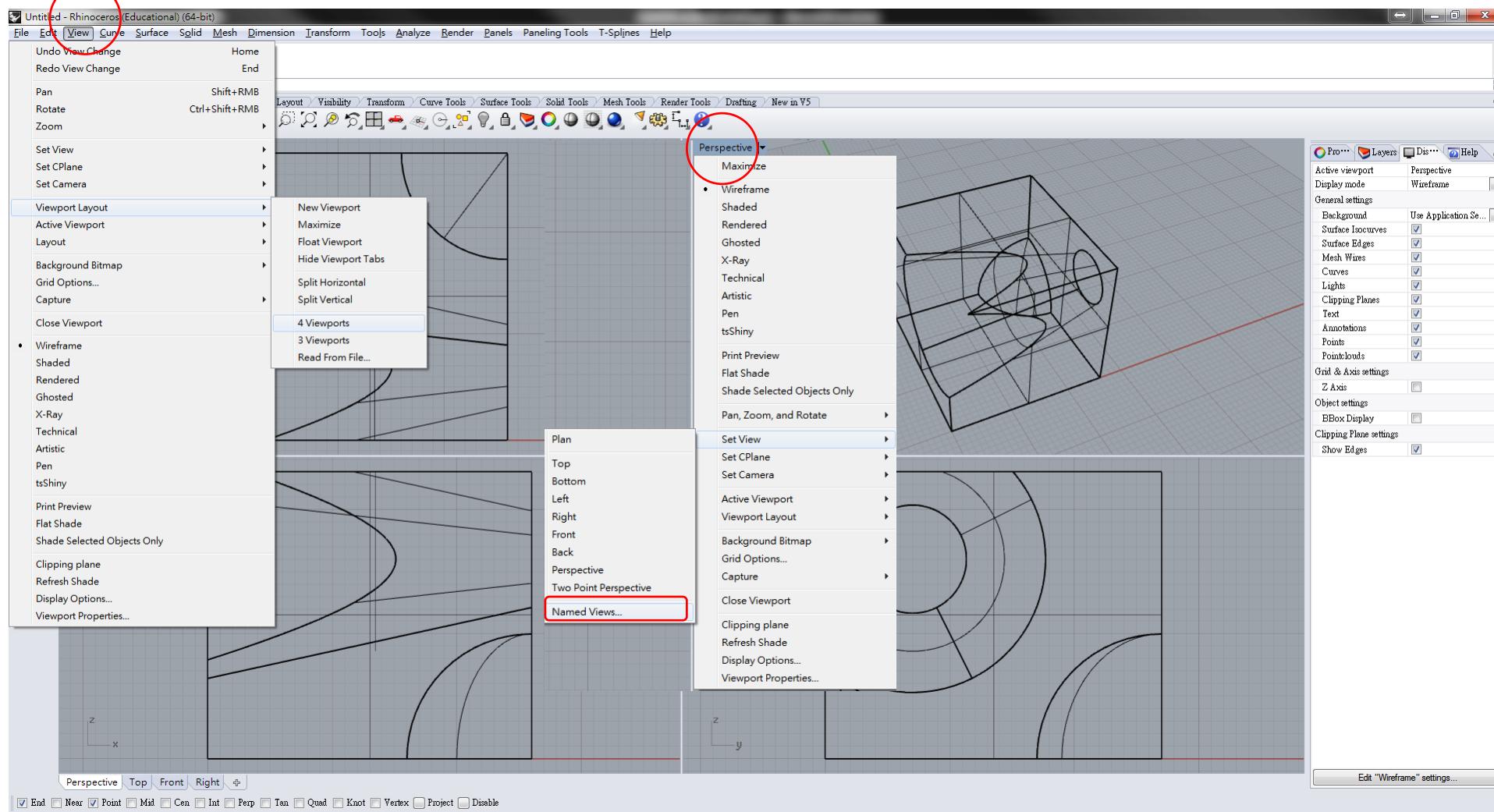


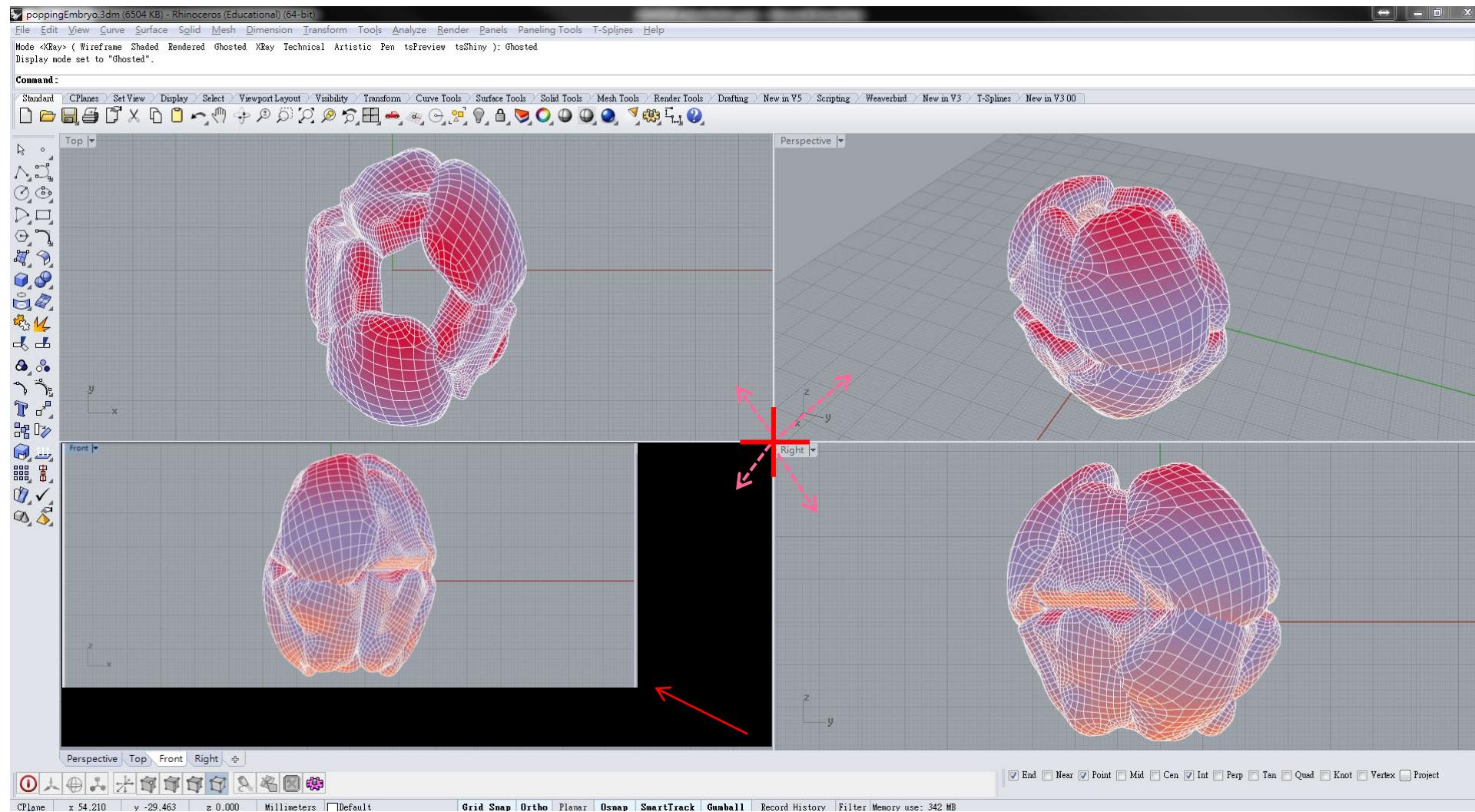
Ctrl + mouse drag to add tool icon
Shift + mouse to edit and delete

	透視投影	平行投影
滑鼠右鍵	旋轉視窗	平移視窗
滑鼠右鍵+Shift	平移視窗	平移視窗
滑鼠右鍵+Ctrl	縮放視窗	縮放視窗
滑鼠滾輪	縮放視窗	縮放視窗
滑鼠右鍵+Ctrl+Alt	移動鏡頭	

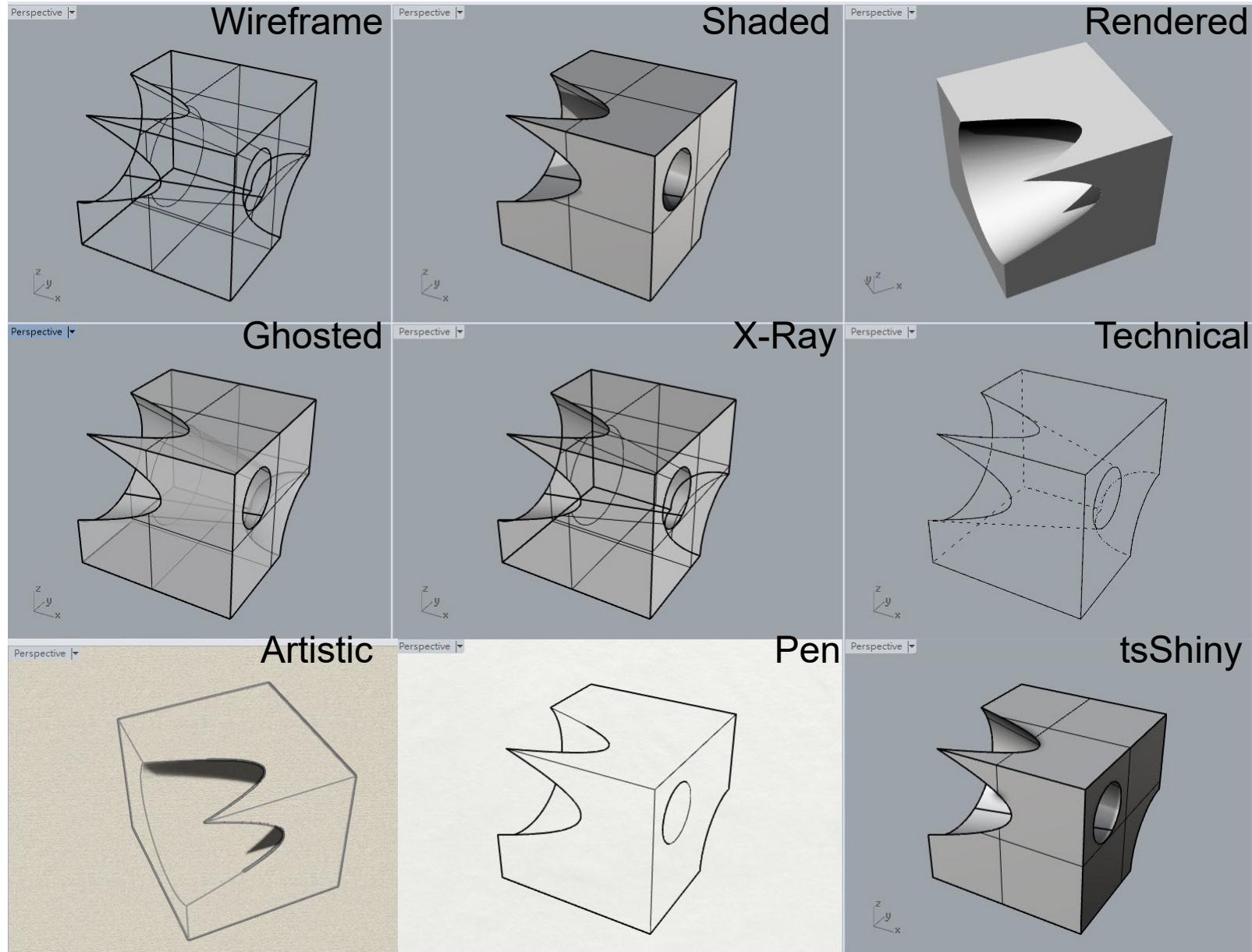
左方向鍵	順時針旋轉	向左平移
左方向鍵+Ctrl	向左平移	
右方向鍵	逆時針旋轉	向右平移
右方向鍵+Ctrl	向右平移	
上方向鍵	向前旋轉	向上平移
上方向鍵+Ctrl	向上平移	
下方向鍵	向後旋轉	向下平移
下方向鍵+Ctrl	向下平移	
Page Up	放大	放大
Page Down	縮小	縮小
Home	復原視圖變更	復原視圖變更
End	重做視圖變更	重做視圖變更

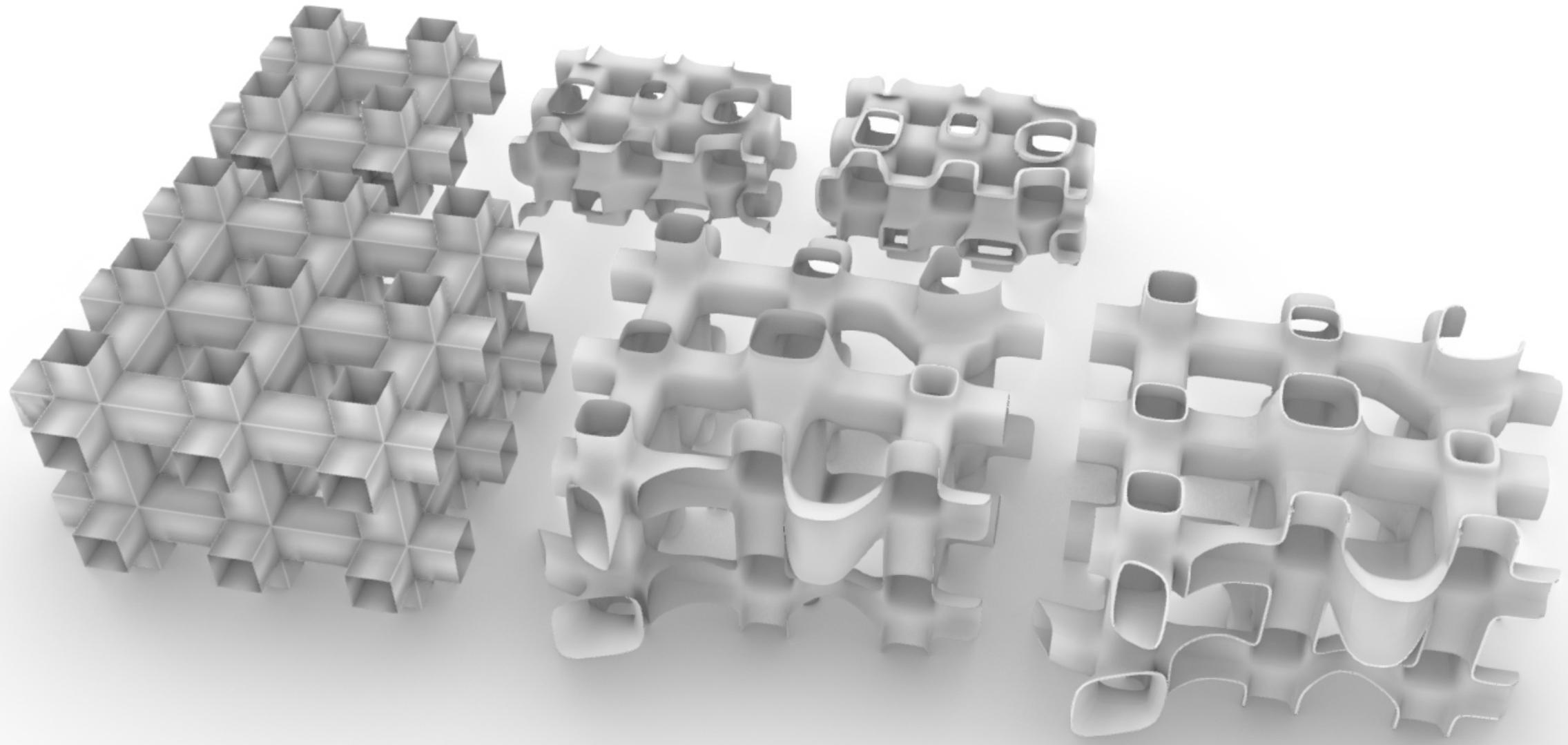
Viewport



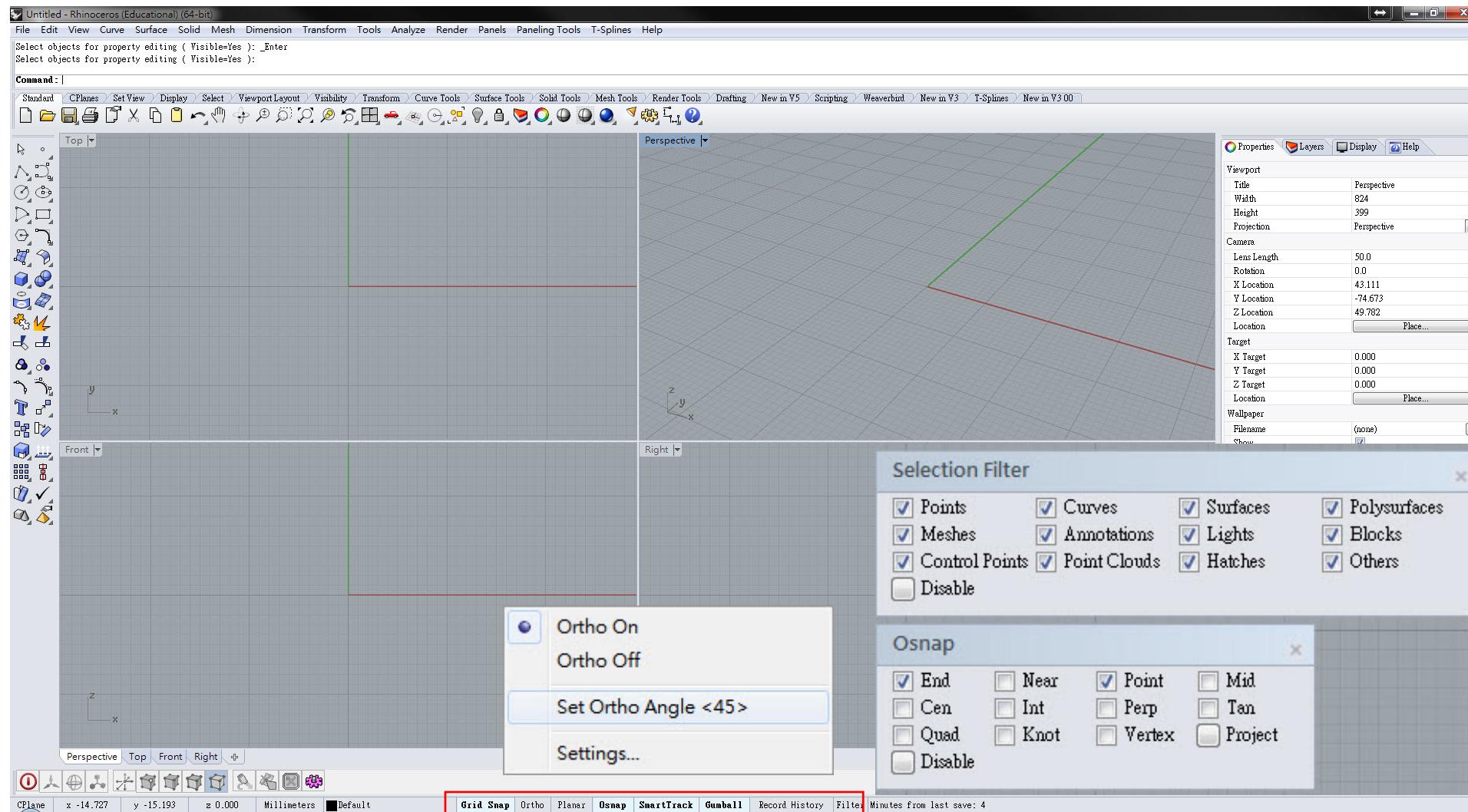


Display Mode





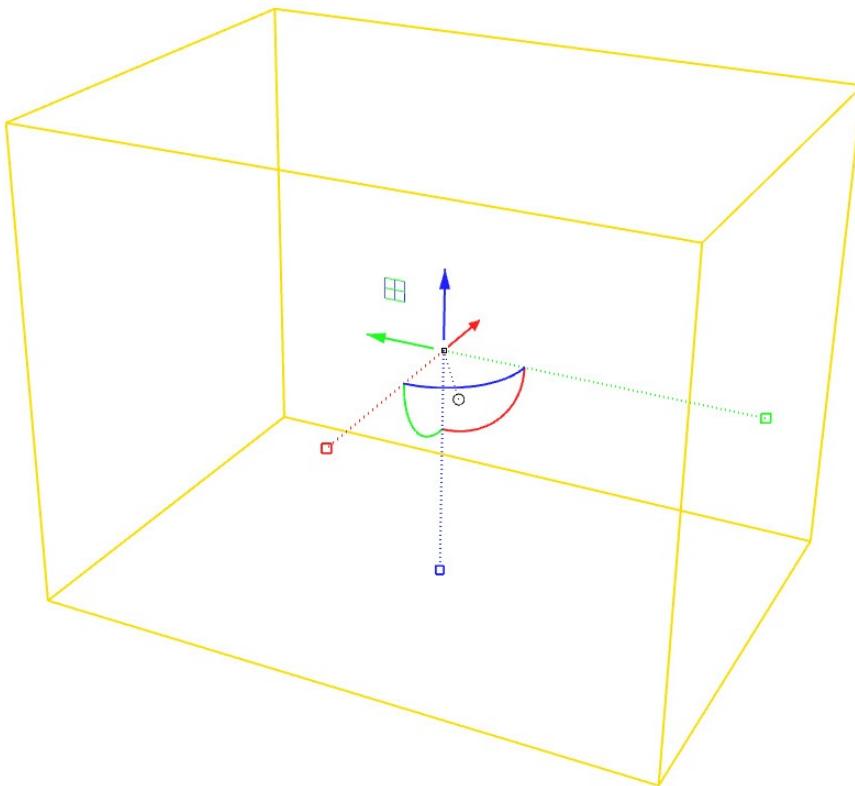
Arctic



鎖定格點、正交、平面模式、物件鎖點、智慧軌跡、操作軸、記錄建構歷史、篩選器
F9 F8 P/Enter

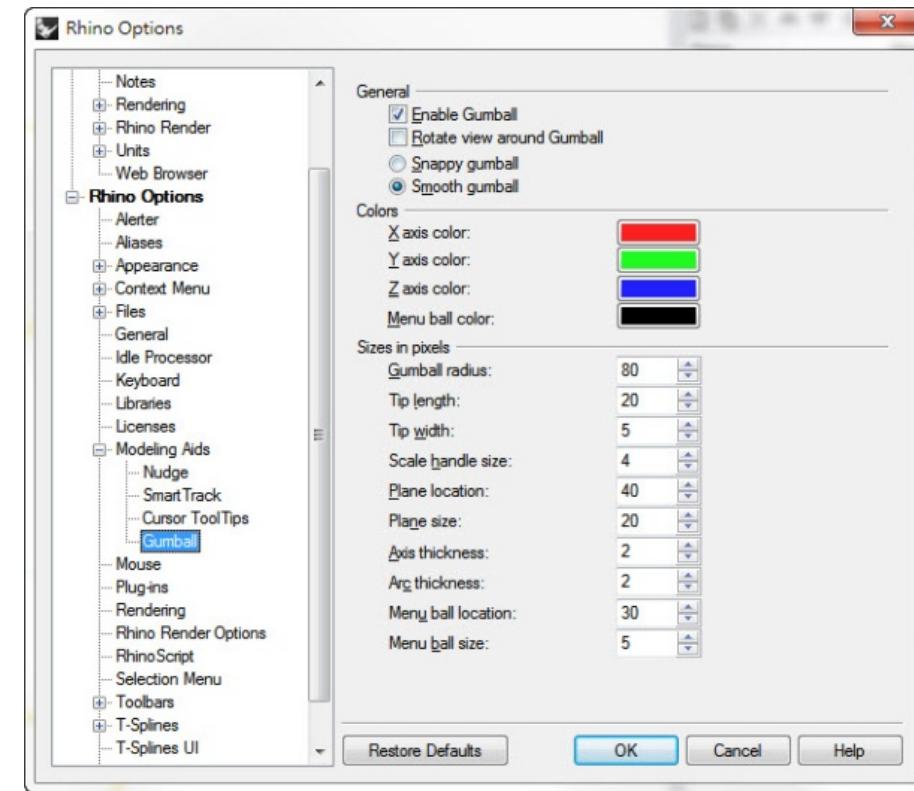
End		端點物件鎖點可以鎖定曲線的端點、曲面邊緣的角或多重曲線的線段端點。
Near		最近點物件鎖點可以鎖定曲線或曲面邊緣距離滑鼠游標最近的點。
Point		點物件鎖點可以鎖定控制點、編輯點、雲點或點物件。
Mid		中點物件鎖點可以鎖定曲線或曲面邊緣的中點。
Cen		中心點物件鎖點可以鎖定曲線的中心點，這個物件鎖點通常用於圓與圓弧。
Int		交點物件鎖點可以鎖定兩條曲線的交點。
Perp		垂直點物件鎖點可以鎖定曲線上的某一點，該點與上一點形成的方向與曲線垂直 這個物件鎖點無法在指令提示指定第一點的時候使用。
Tan		切點物件鎖點可以鎖定曲線上的某一點，該點與上一點形成的方向與曲線正切 這個物件鎖點無法在指令提示指定第一點的時候使用。
Quad		四分點物件鎖點可以鎖定四分點，四分點是一條曲線在工作平面 X 或 Y 軸座標最大值或最小值的點。
Knot		節點物件鎖點可以鎖定曲線或曲面邊緣上的節點。
Project		將鎖定的點投影至工作平面上。
Vertex		可以鎖定網格物件的頂點。
停用		關閉持續性物件鎖點但保留設定。

Gumball

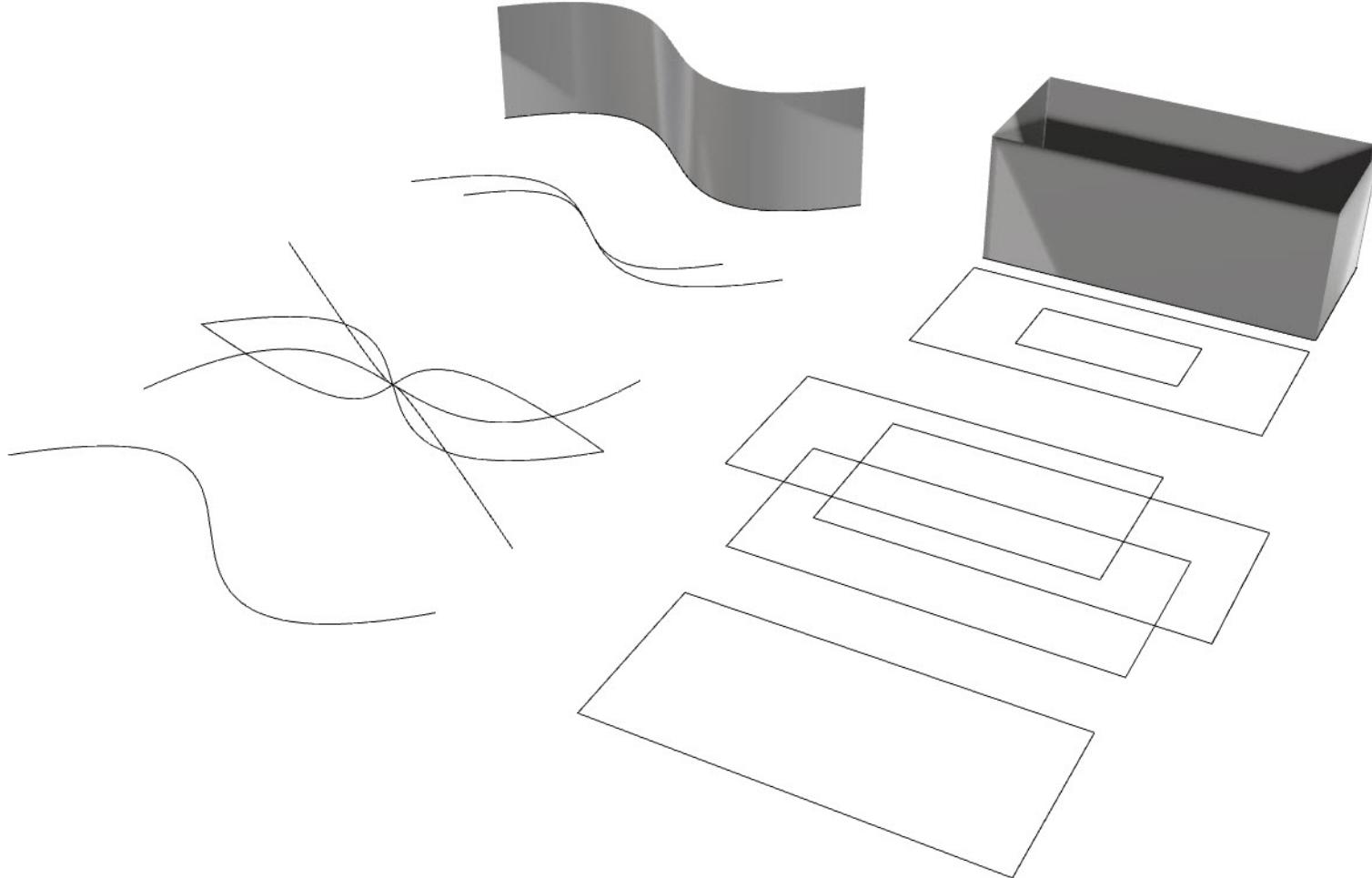


→ 移動
----- 縮放
—— 旋轉
□ 平移
□ 設定
○ 原點

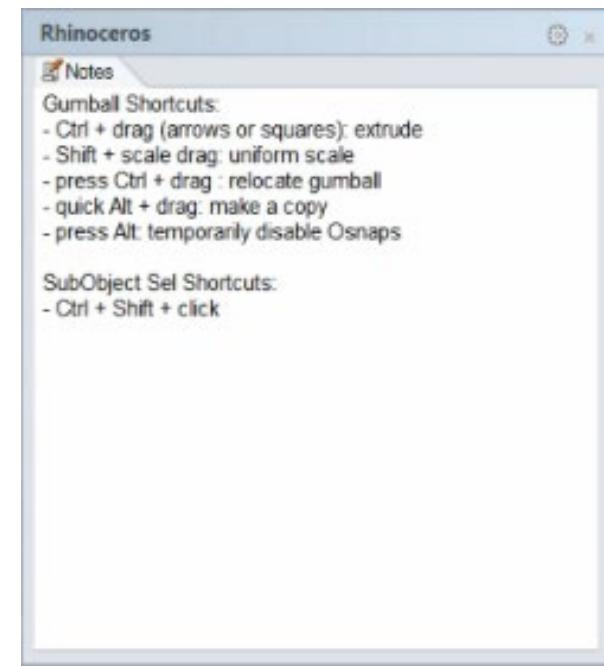
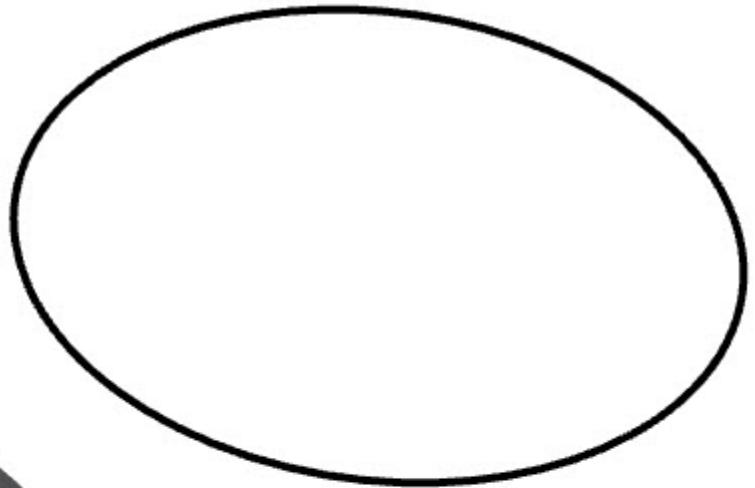
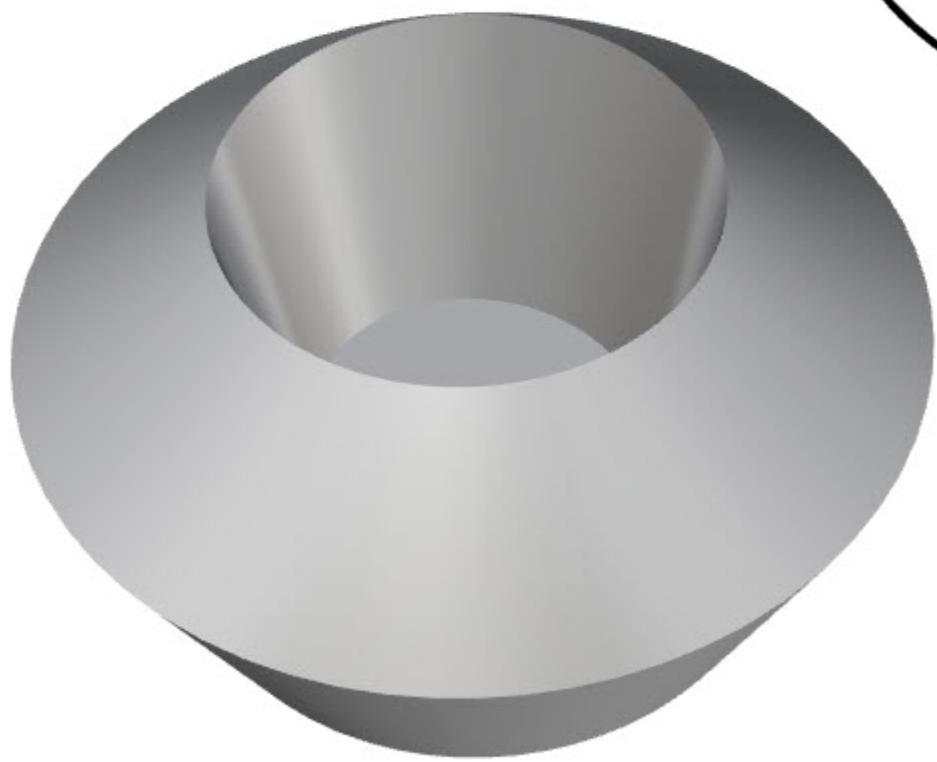
- Relocate Gumball
- Reset Gumball
- Align to CPlane
- Align to Object
- Align to World
- Snappy Dragging
- Smooth Dragging
- Set Drag Strength <100%>
- Settings...



- Gumball On
- Gumball Off
- Align to CPlane
- Align to Object
- Align to World
- Snappy Dragging
- Smooth Dragging
- Rotate View Around Gumball
- Set Drag Strength <100%>
- Settings...



**點按Alt + 動作可複製物件
長按Shift+ 縮放為三軸縮放
先按Ctrl + 動作可定義原點
先按動作 + Ctrl可擠出曲面
先按Shift +Ctrl+左鍵可選子物件**



Notes

Gumball Shortcuts:

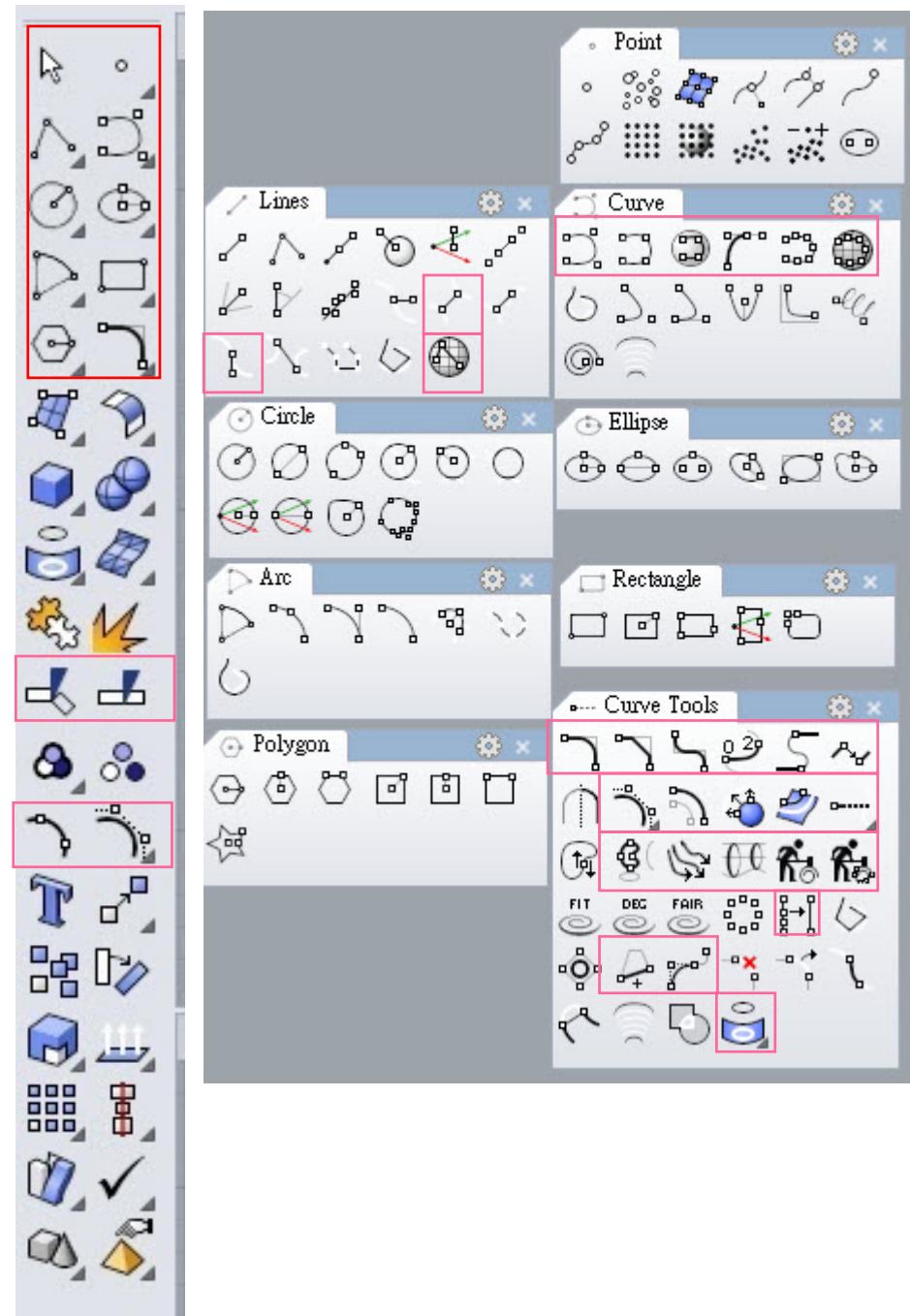
- Ctrl + drag (arrows or squares): extrude
- Shift + scale drag: uniform scale
- press Ctrl + drag : relocate gumball
- quick Alt + drag: make a copy
- press Alt: temporarily disable Osnaps

SubObject Sel Shortcuts:

- Ctrl + Shift + click

Rhinoceros
NURBS-Based Modeling System
Non-Uniform Rational Basis Spline

CP **控制點**
EP **編輯點**
Knot **節點**
Degree **階數**



NURBS Curve

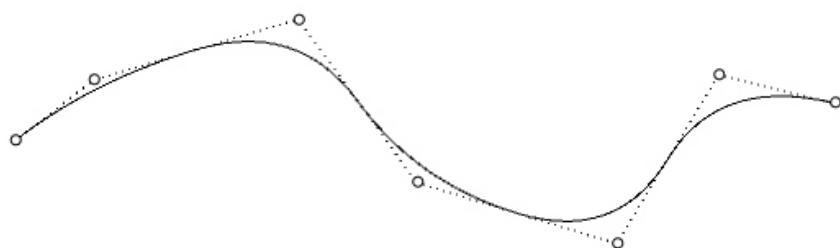
**直線 Line 曲線Curve
(polyline)**

**開放曲線
封閉曲線**

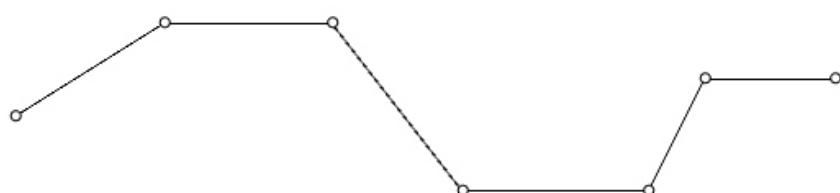
CP
Knot
Degree

控制點 節點 階數

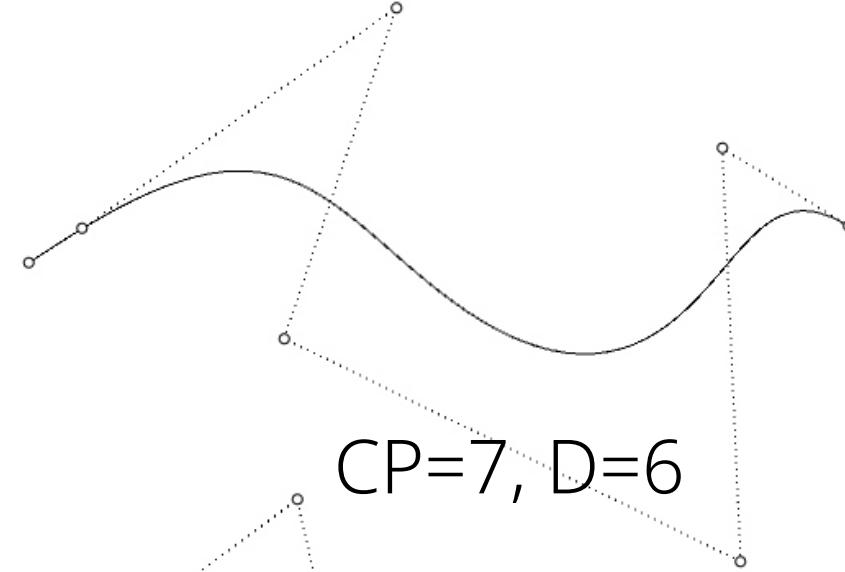
CP=D+1
K =CP+D-1



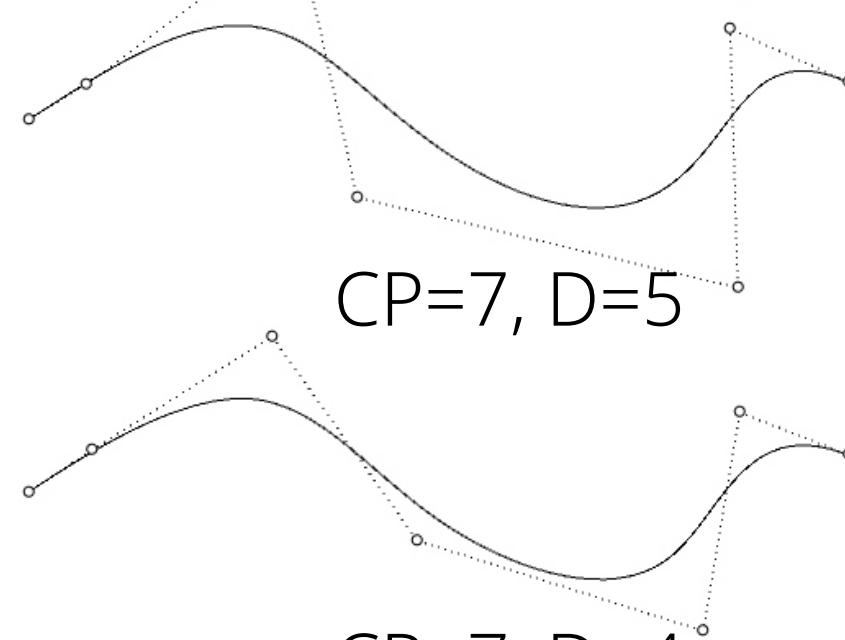
CP=7, D=3



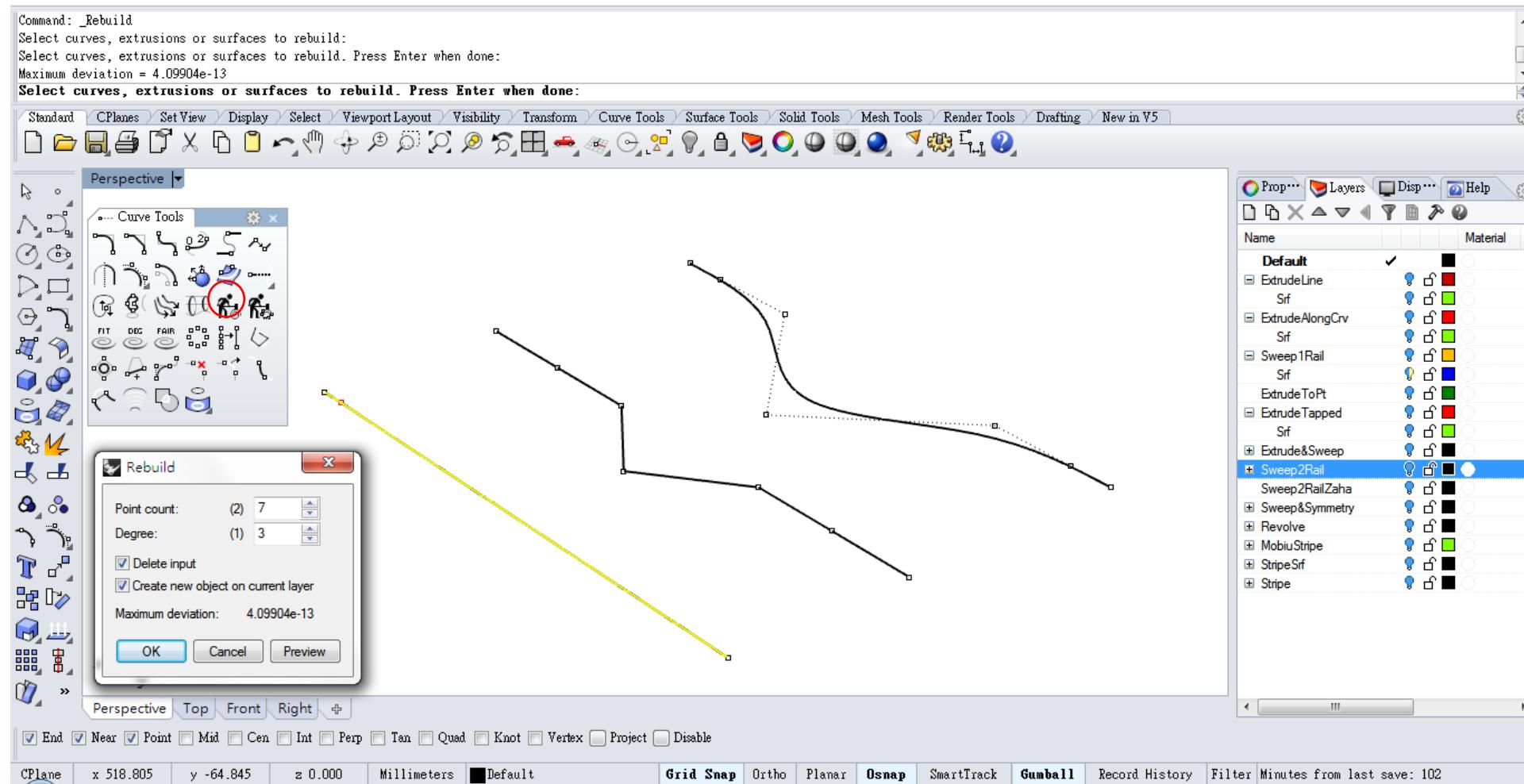
CP=7, D=2



CP=7, D=6

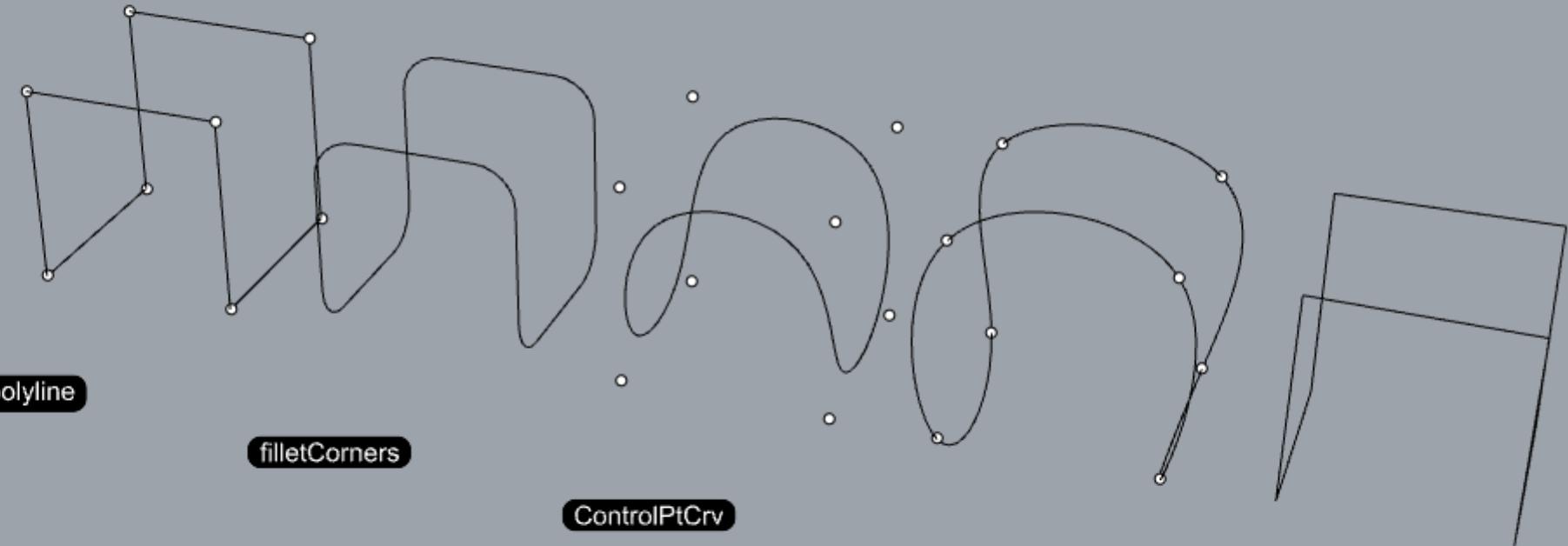


CP=7, D=5



Rebuild Curve

(0,0,0)
(0,0,10)
(10,0,0)
(10,0,10)
(10,10,0)
(10,10,10)
(0,10,0)
(0,10,10)



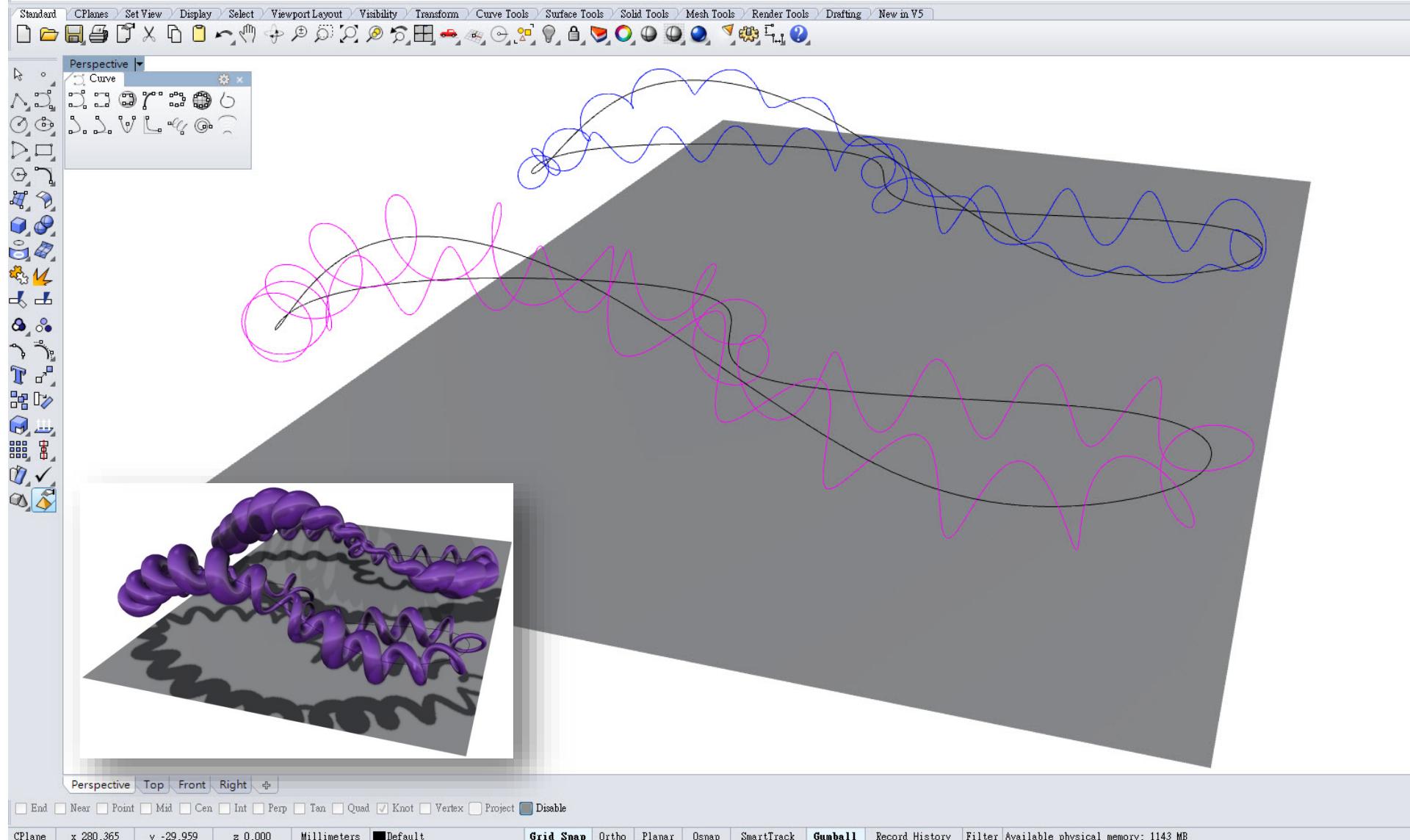
ControlPtCrv

InterpolateCrv

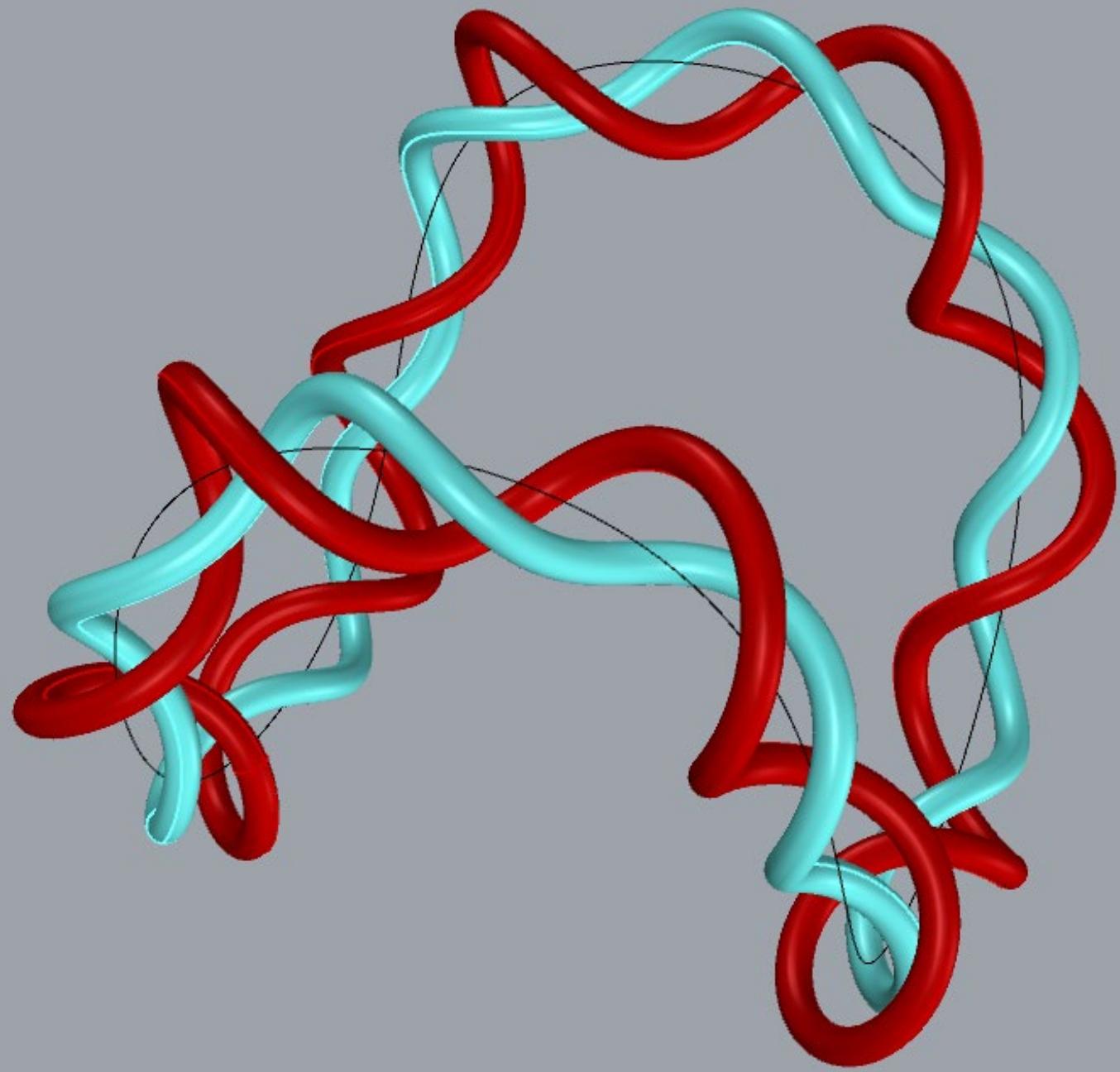
RebuildCrv

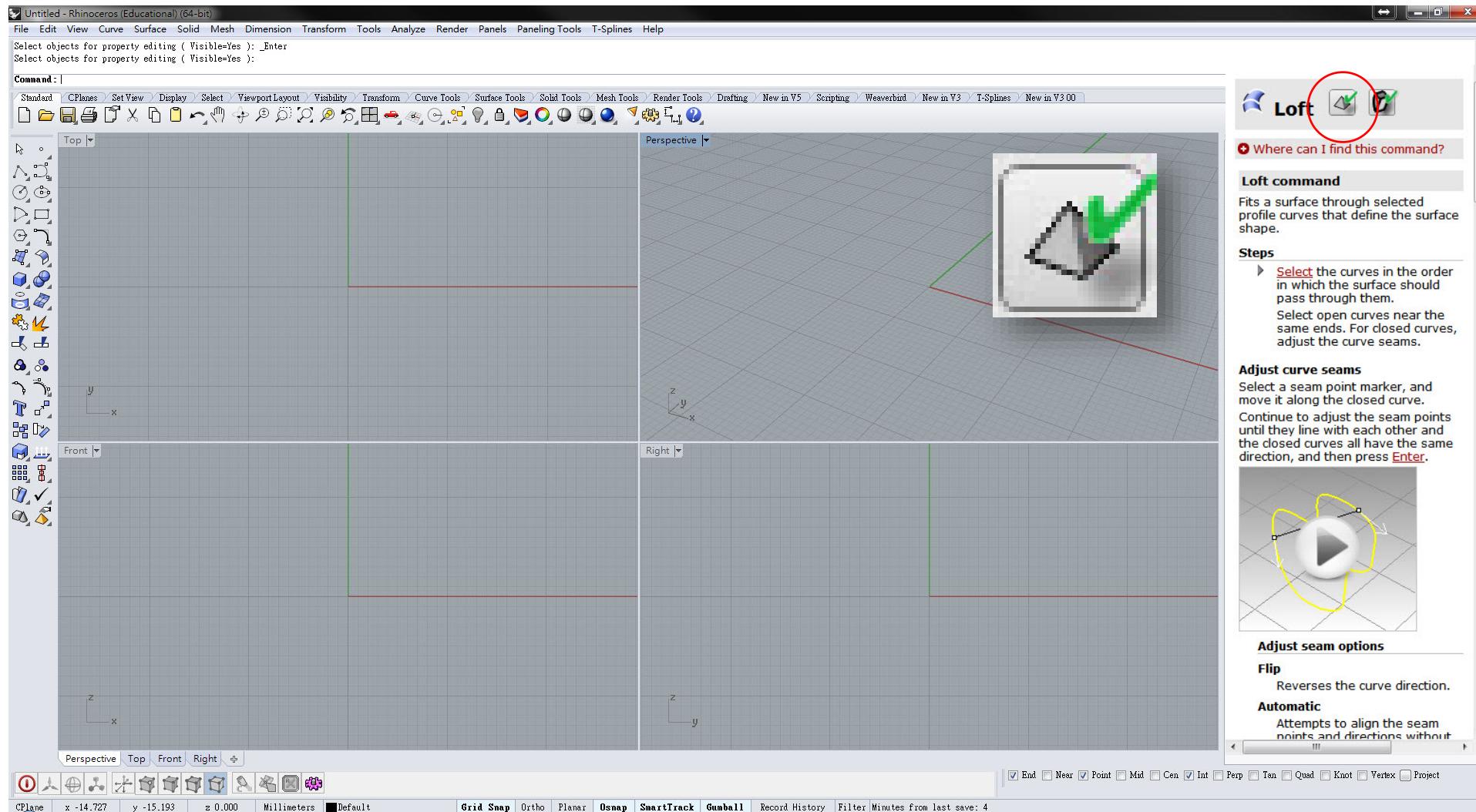
1 surface added to selection.
1 object changed to layer "Default".

Command : |

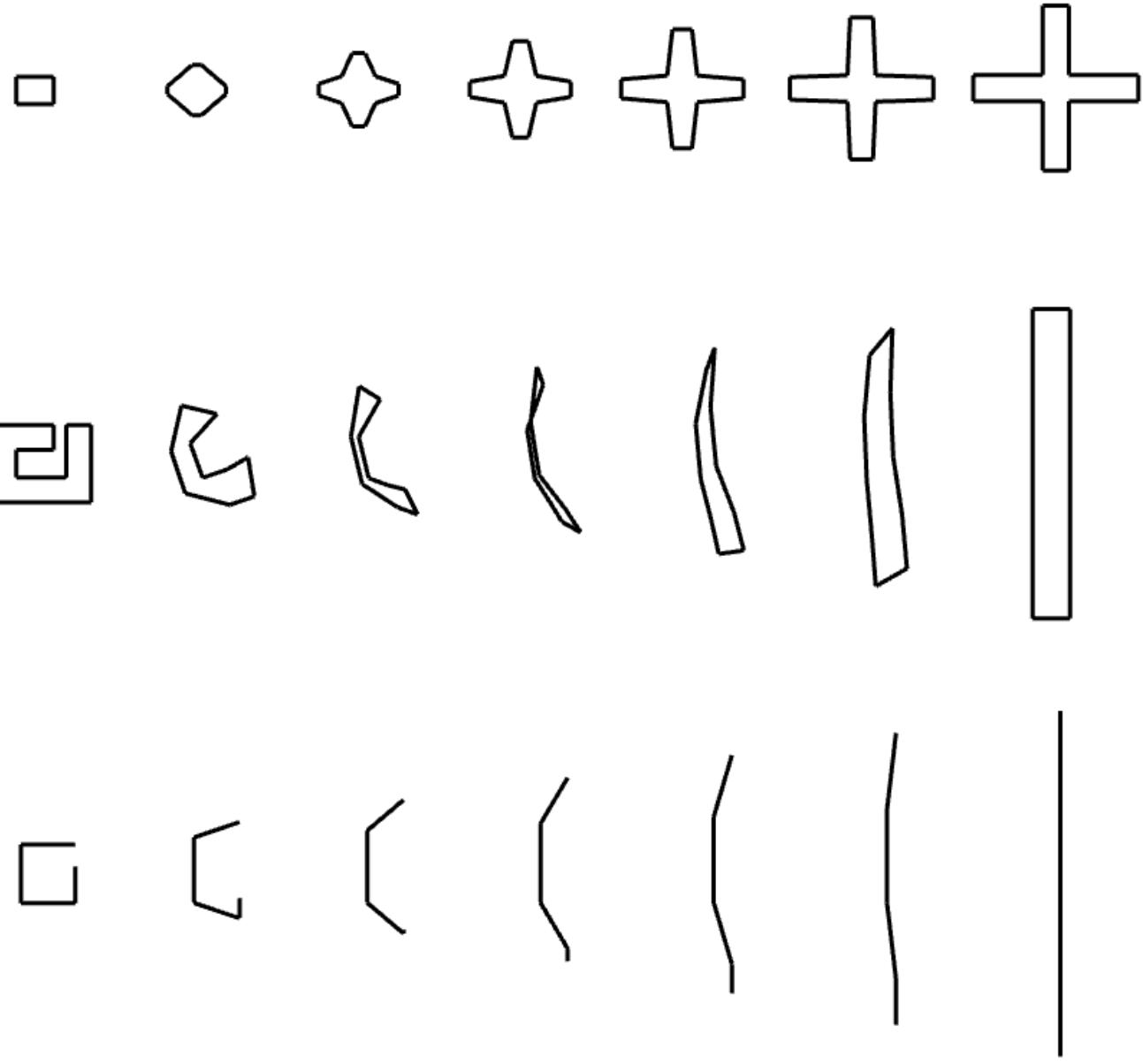
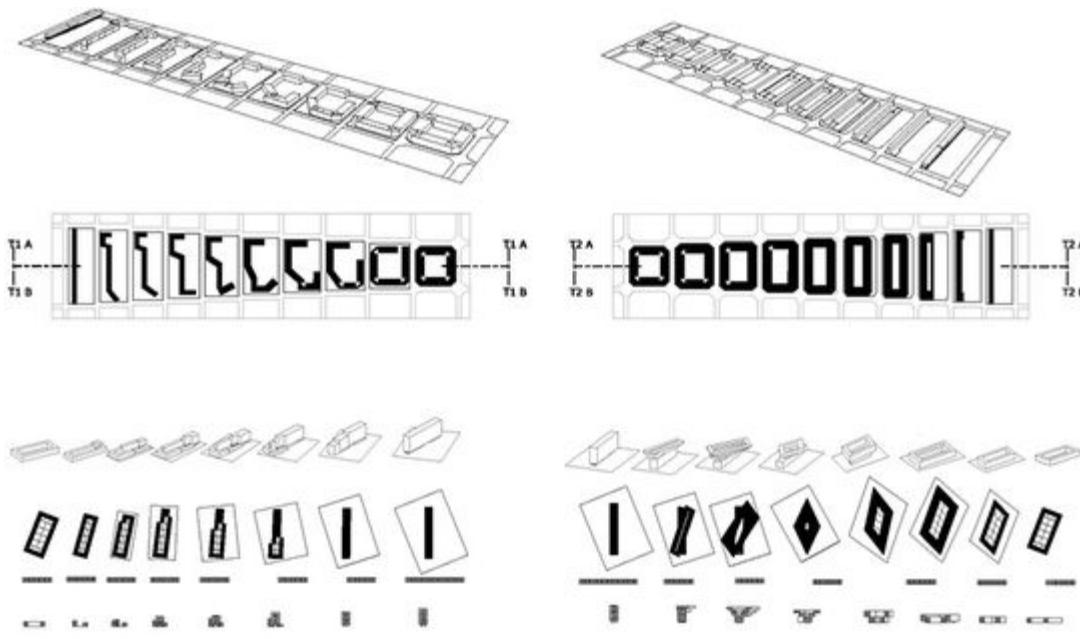


Helix & Spiral



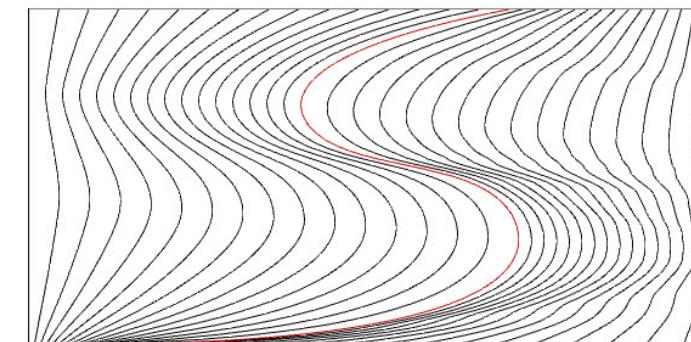
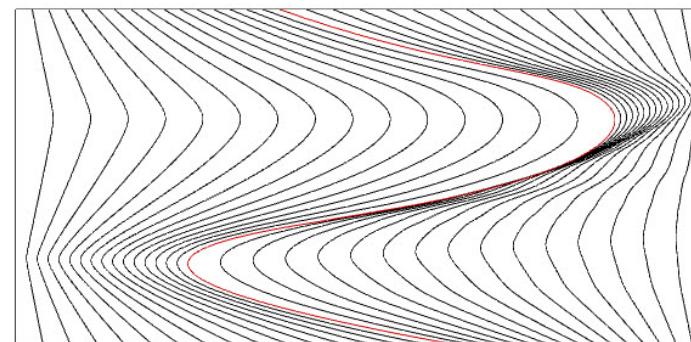
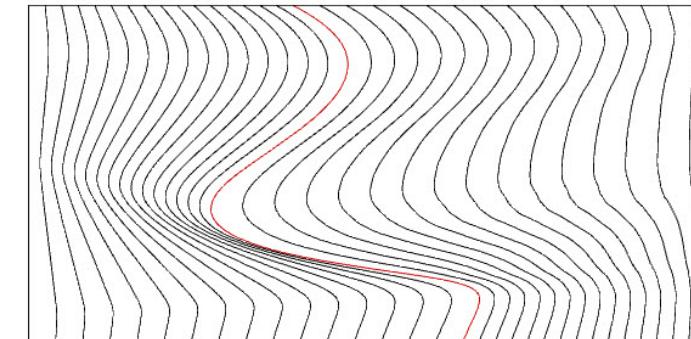
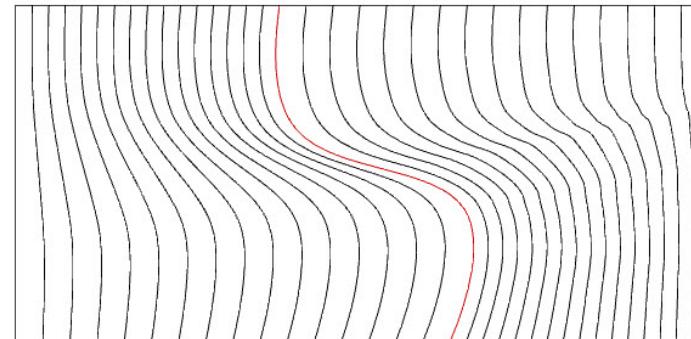
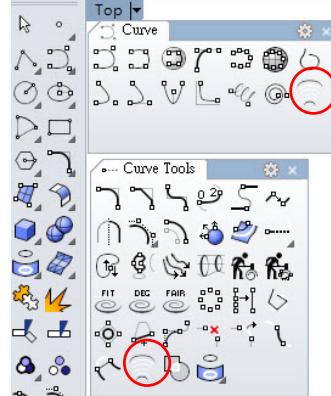


可記錄建構歷史的指令



Drag objects, tap Alt to make a duplicate, press and hold Alt to temporarily toggle osnaps:
History updated 30 objects.

Command:



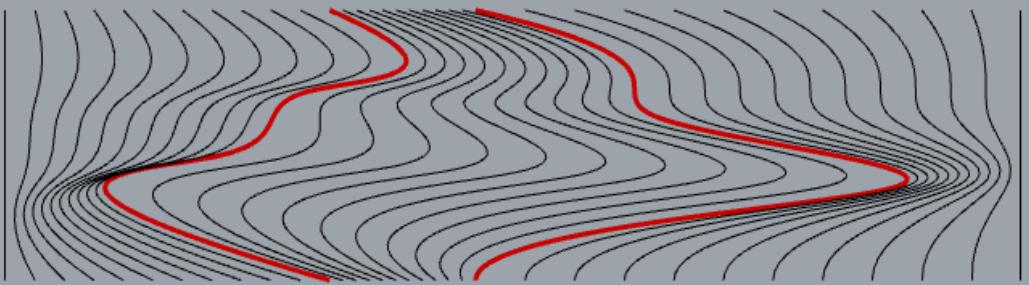
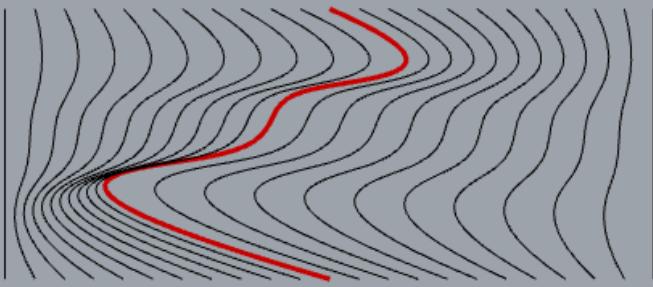
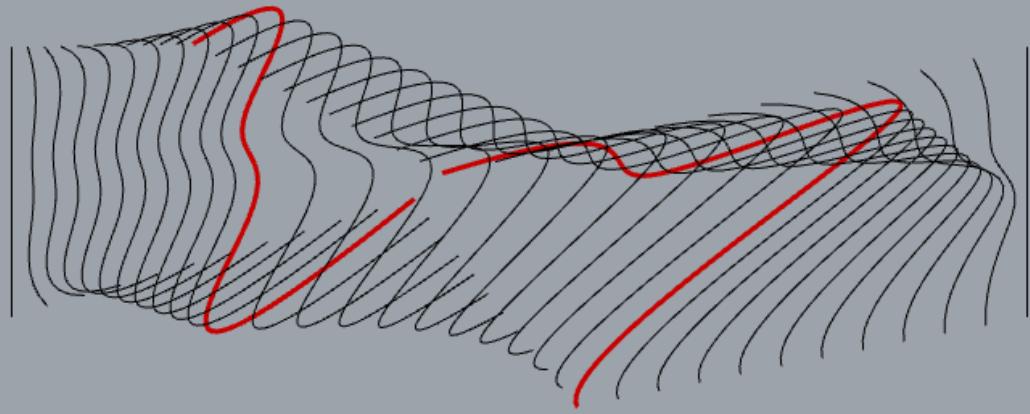
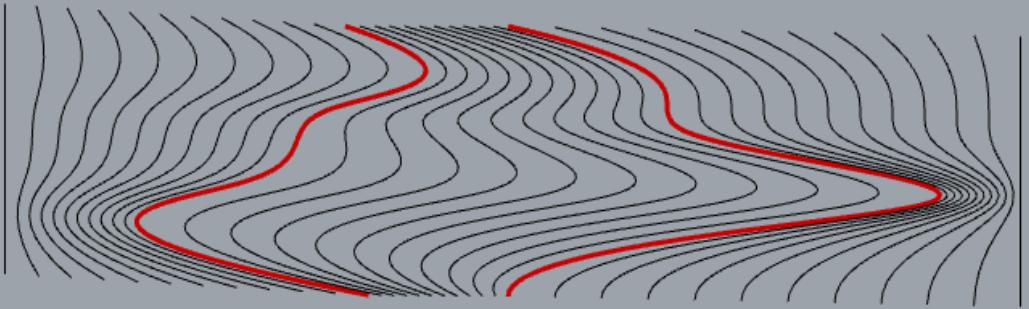
Perspective Top Front Right

End Near Point Mid Cen Int Perp Tan Quad Knot Vertex Project Disable

CPlane x 2006.287 y -2014.591 z 0.000 Millimeters Default

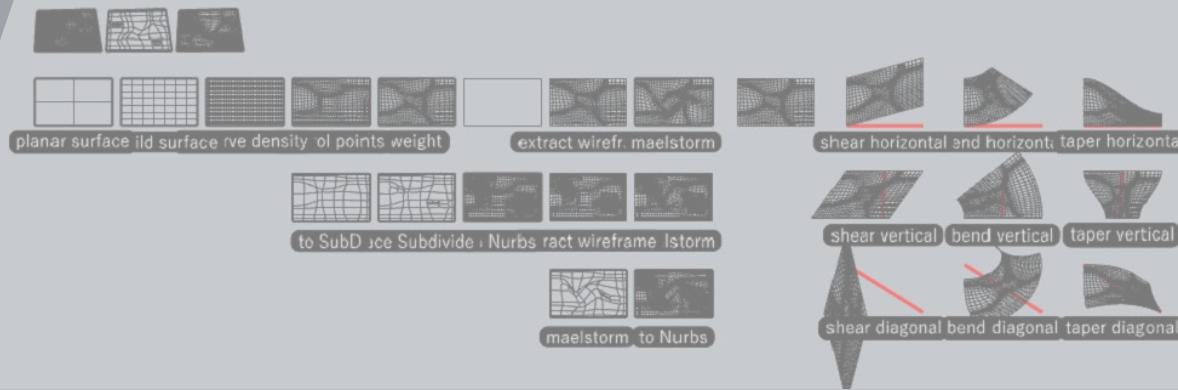
Grid Snap Ortho Planar Osnap SmartTrack Gumball Record History Filter CPU use: 17.2 %

Tween



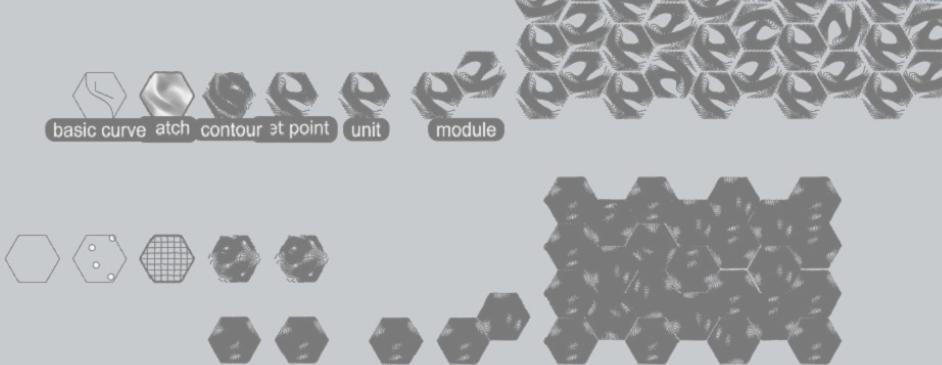
Planar Surface
Rebuild Surface
Control Point Weight
Extract Wireframe
SubD
Maelstrom
Shear
Bend
Taper

Network Grid



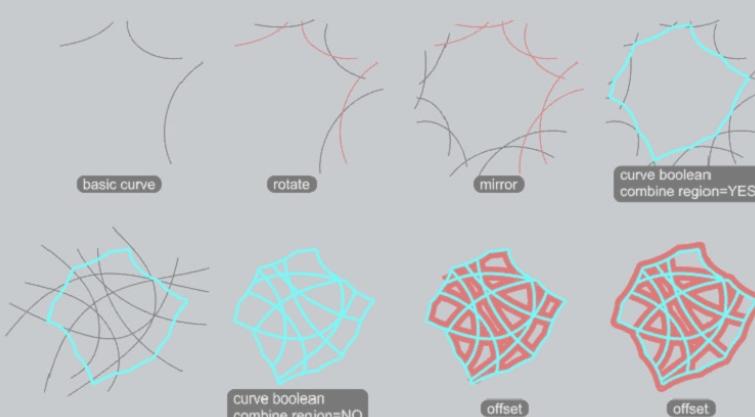
Polygon Curve
Patch
Contour
Set Point
Array
Gumball

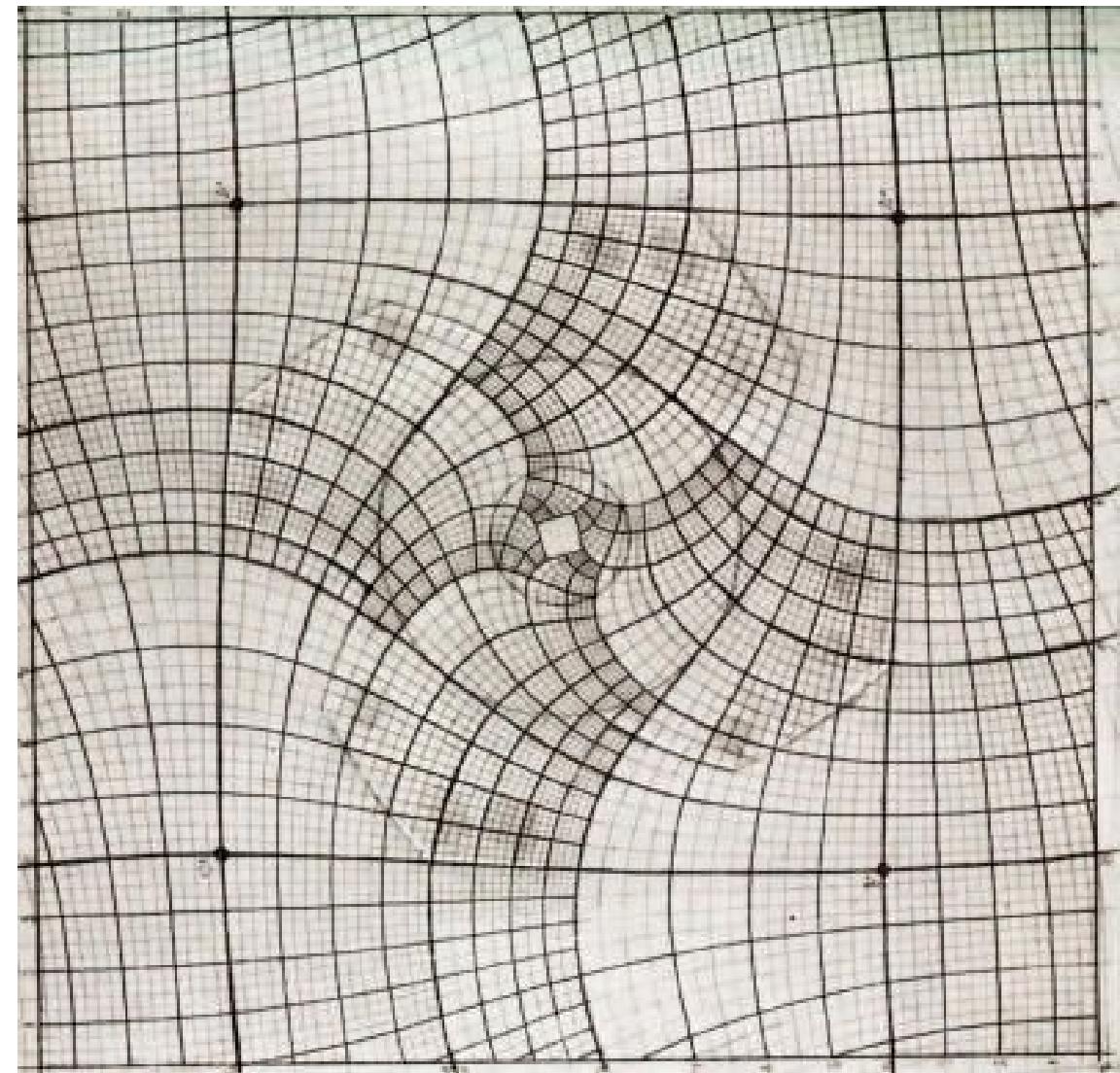
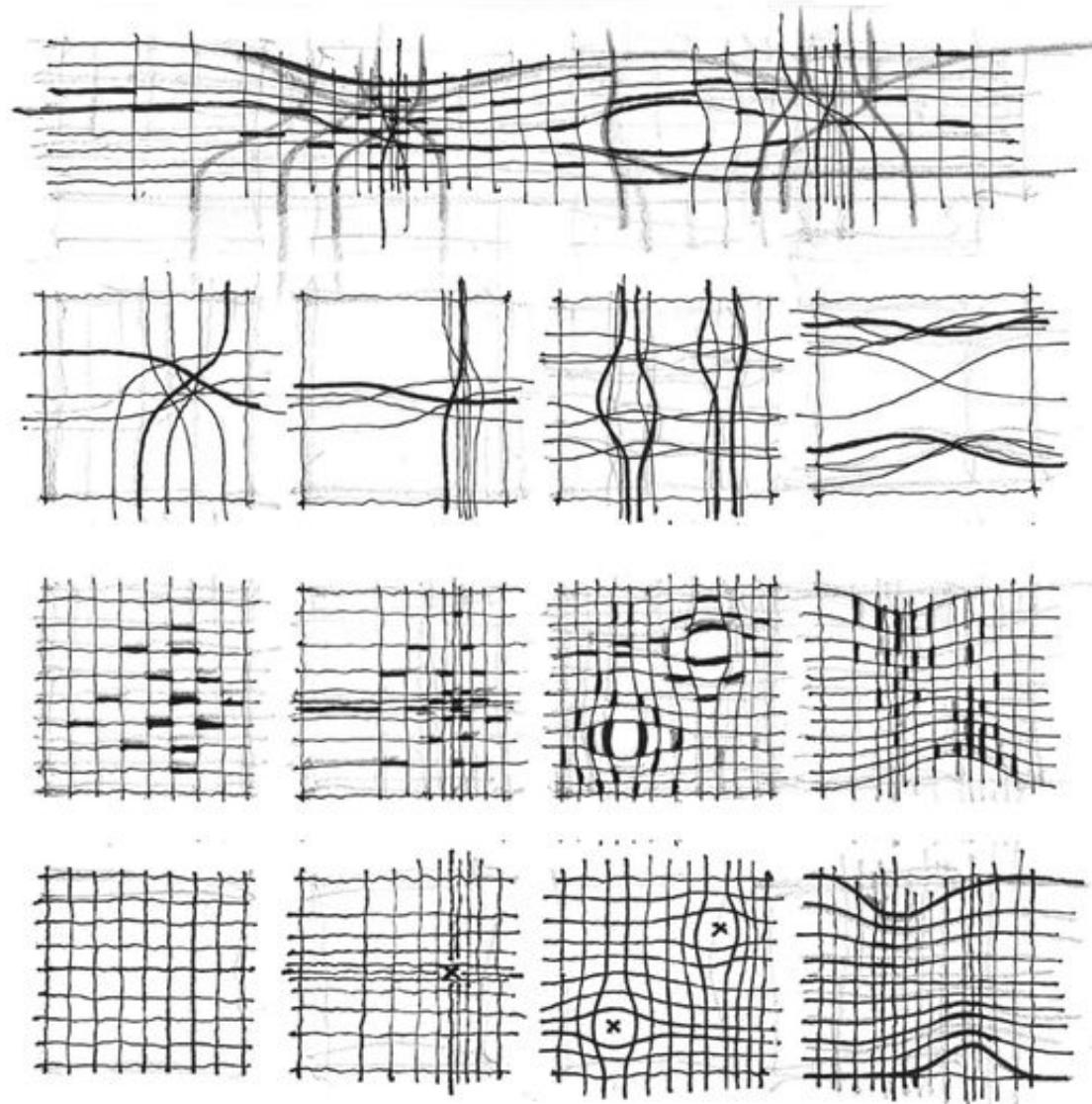
Morph Tile

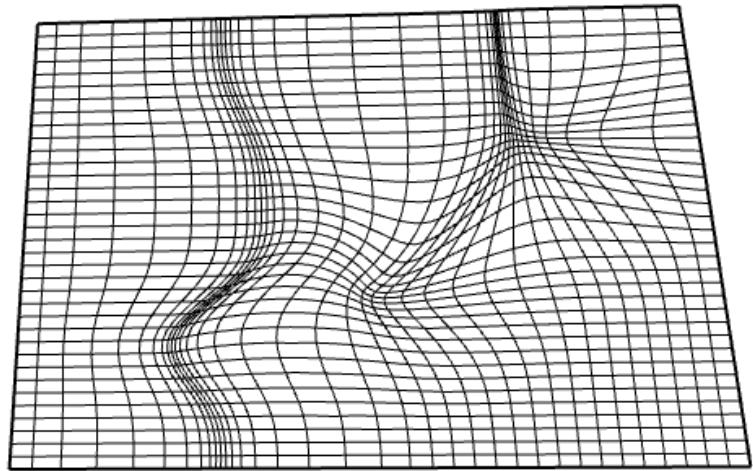


Curve
Rotate
Mirror
Curve Boolean
Offset
Grasshopper
GhPython

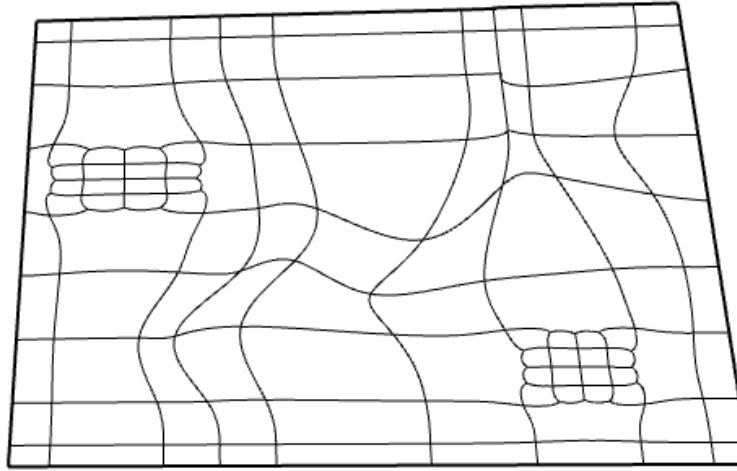
Multi Offset



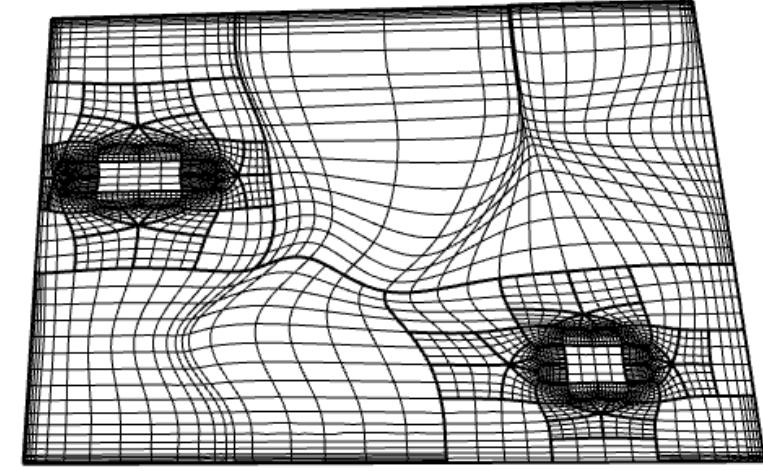




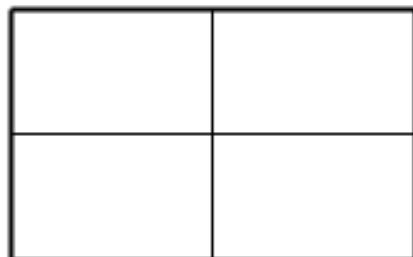
Surface



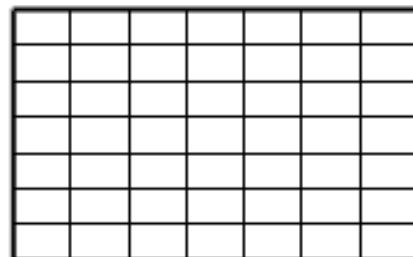
SubD



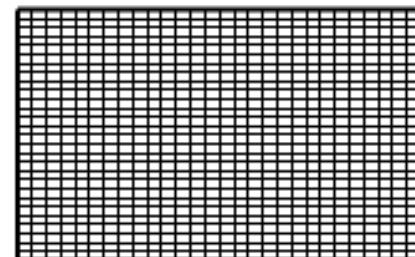
Polysurface



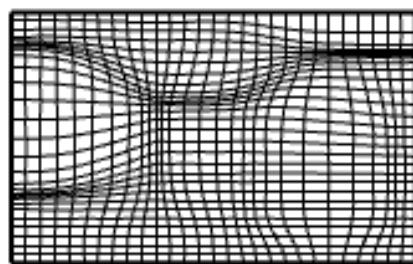
planar surface



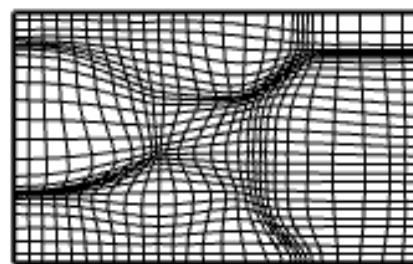
rebuild surface



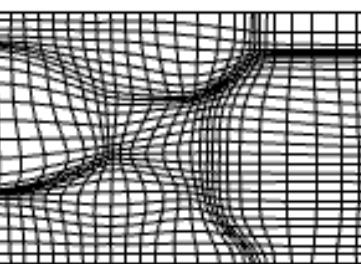
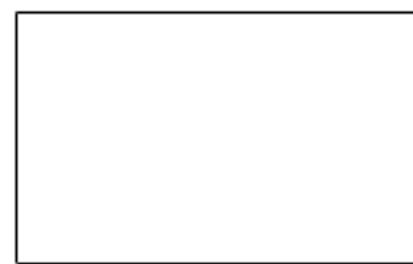
isocurve density



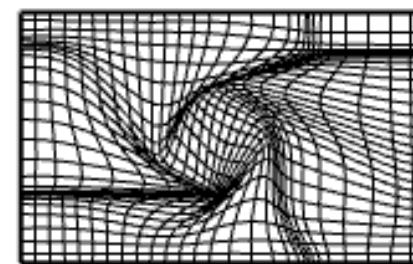
control points



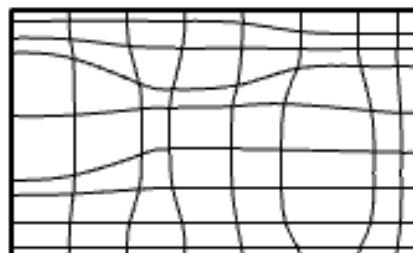
weight



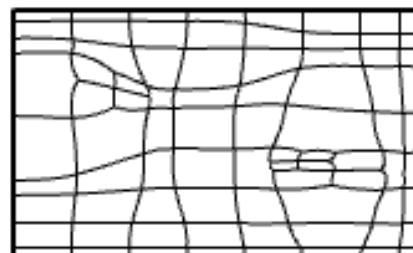
extract wireframe



maelstrom



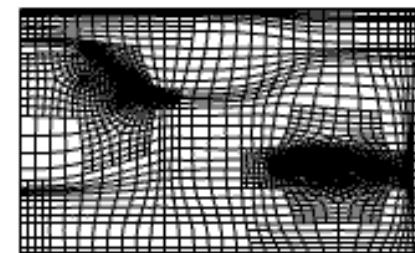
to SubD



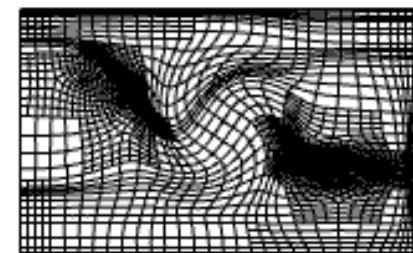
face Subdivide



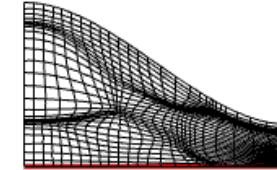
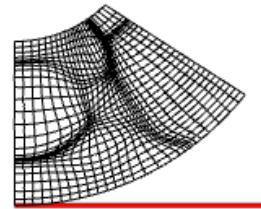
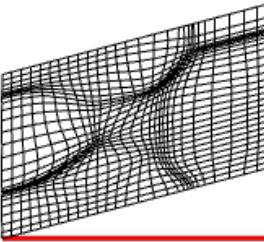
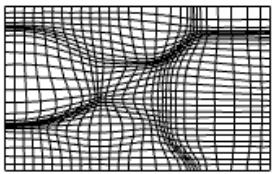
to Nurbs



extract wireframe



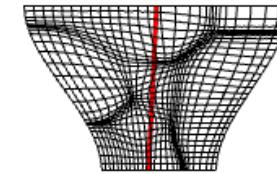
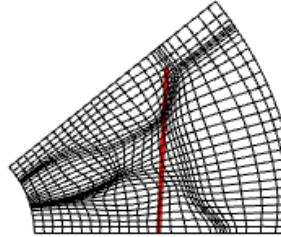
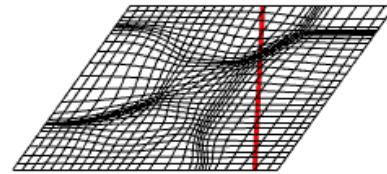
maelstrom



shear horizontal

bend horizontal

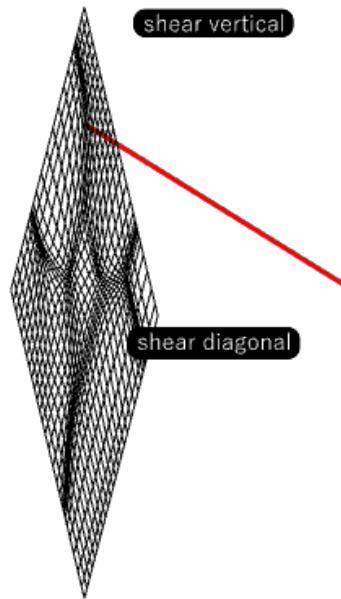
taper horizontal



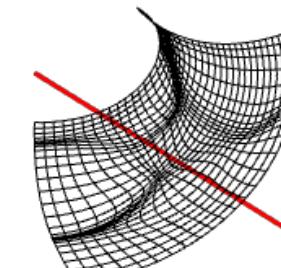
shear vertical

bend vertical

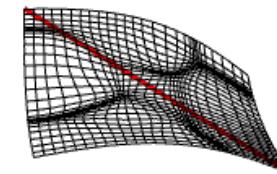
taper vertical



shear diagonal



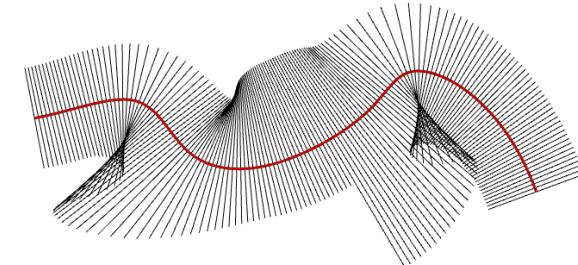
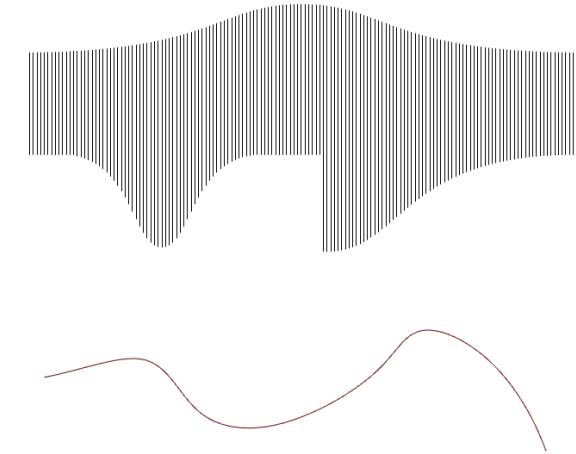
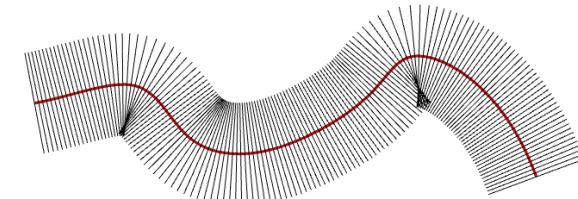
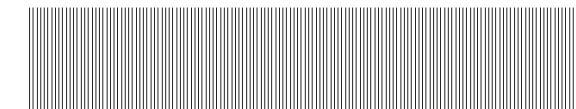
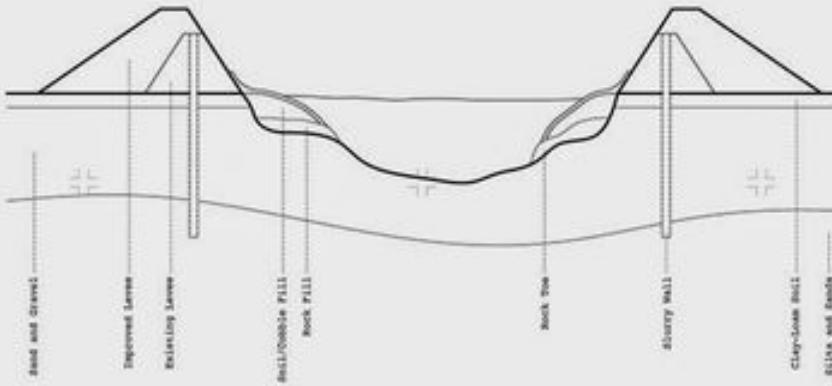
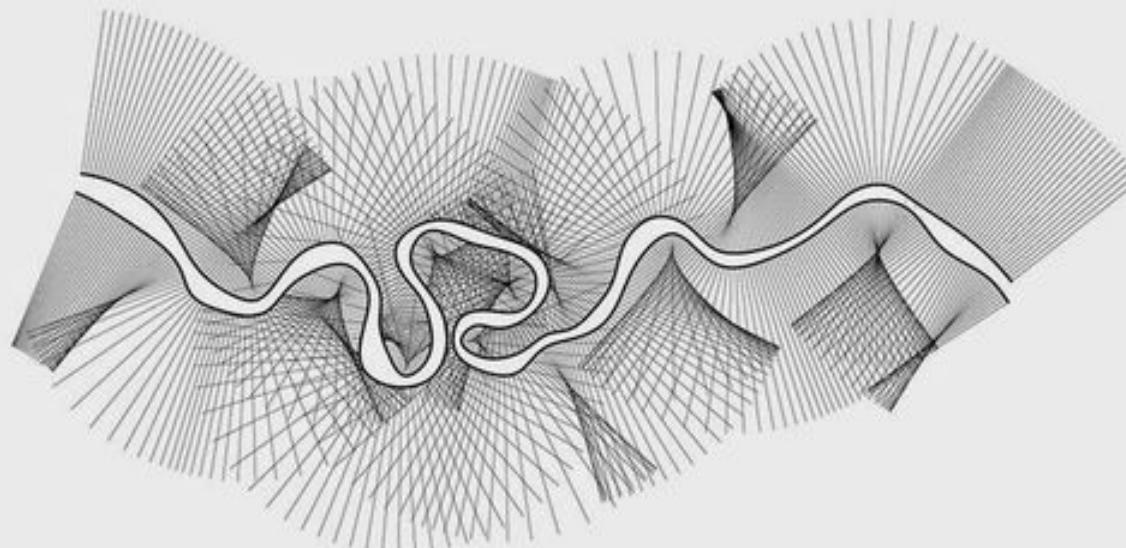
bend diagonal

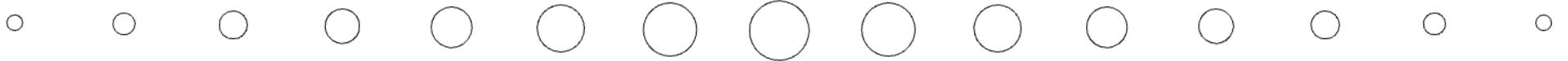
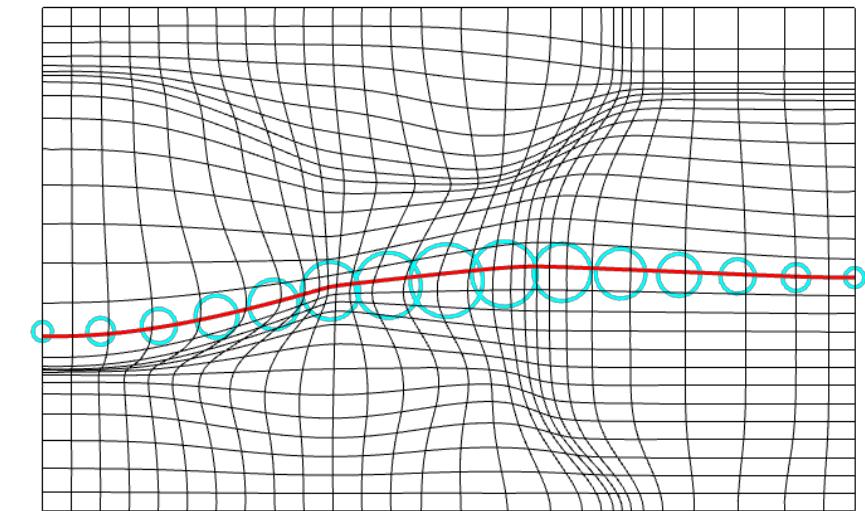
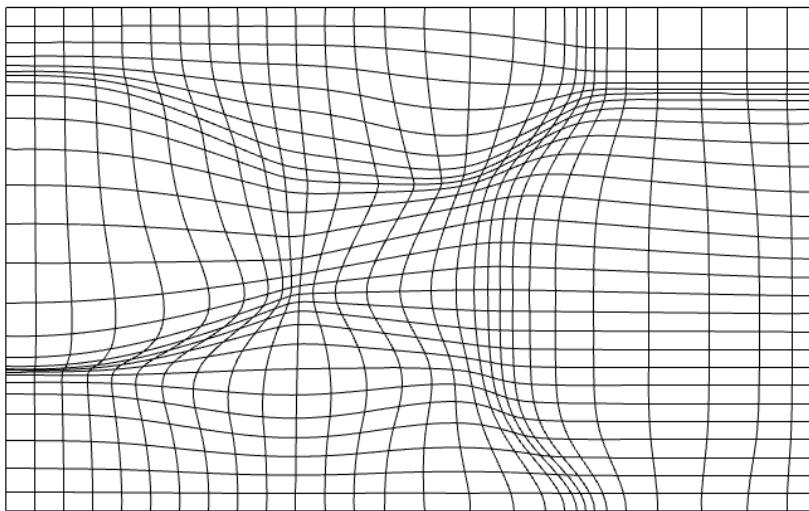
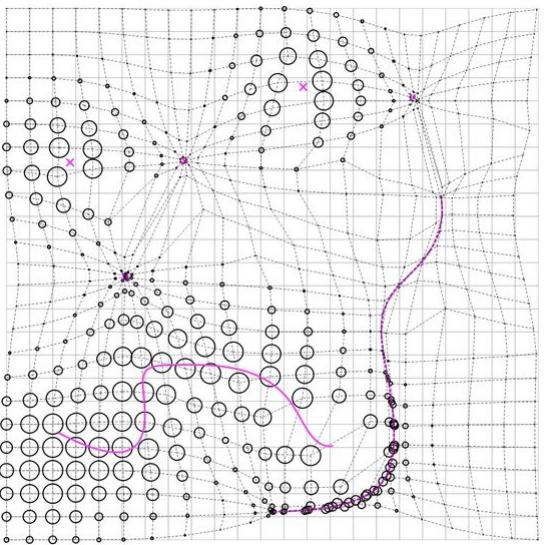


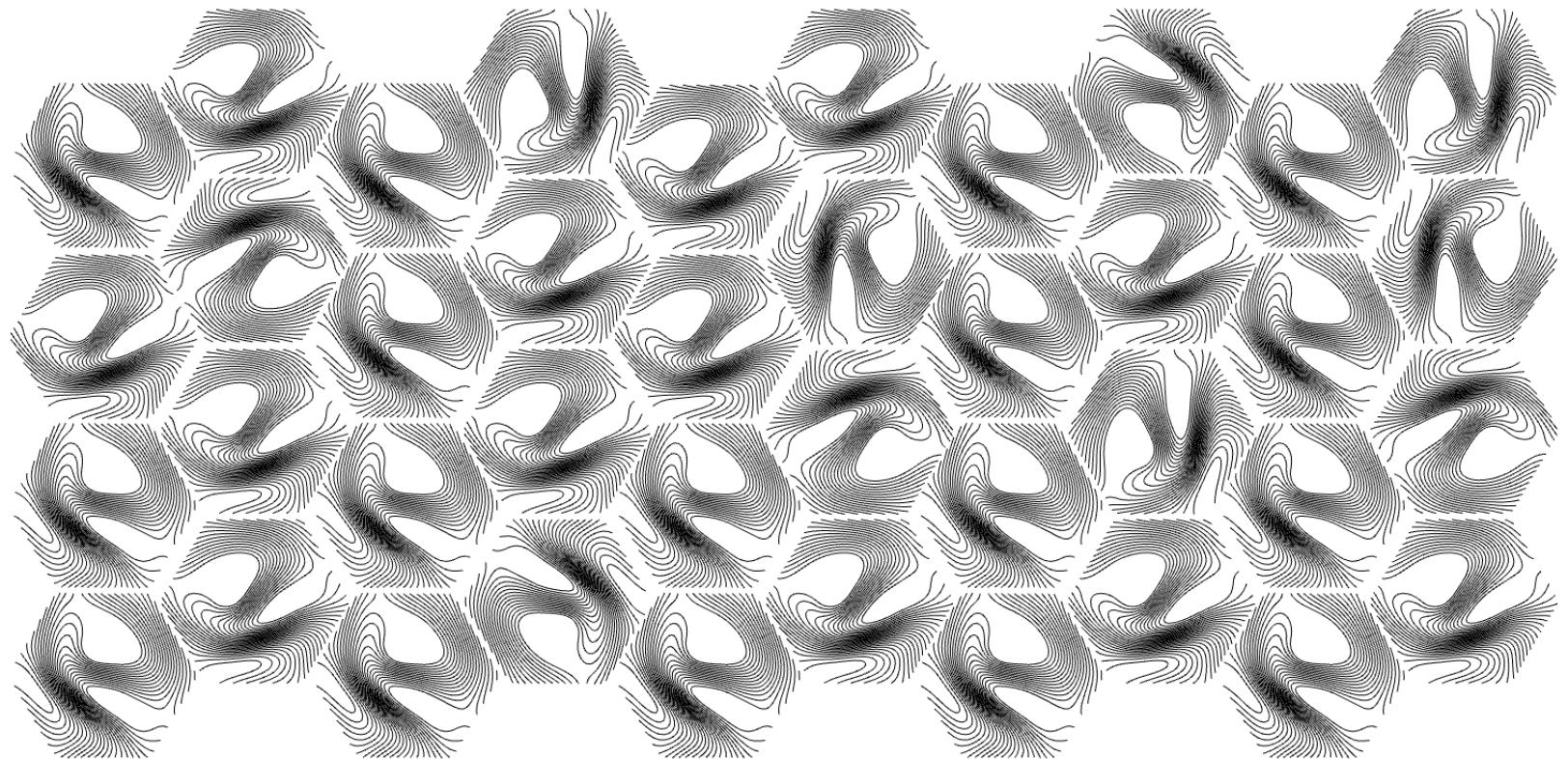
taper diagonal

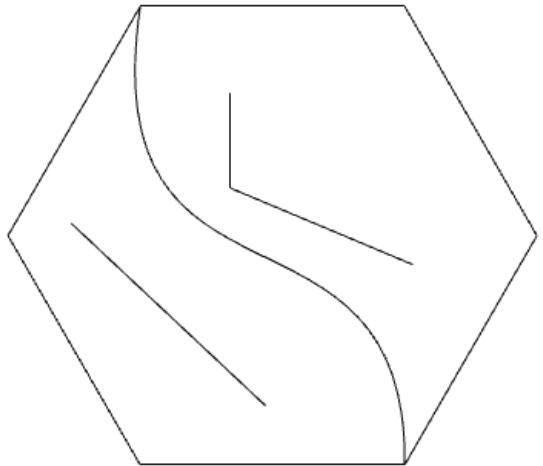
The main purpose of an artificial levee is to prevent flooding of the adjoining countryside; however, they also reduce the flow of the river, resulting in higher and more water flow. This can lead to increased erosion downstream, which is an important concern for an environmental community, since the levee, as a tool, can only slightly increase the depth of the channel, but it will reduce the water level in the basin, potentially increasing the erosion, leading to an increase in the potential damage and destruction by natural events.

Levees are usually built by piling earth on a concrete, steel structure, based at the bottom, they taper to a level top, where materials such as sand or rockfill can be placed. These flood defences are constructed to withstand the force of waves, currents, and tides. Most levees have a central canal, which is used for drainage and evacuation purposes. Levees are typically made of soil, sand, gravel, and other materials, such as rock, concrete, and timber. Some levees are designed to withstand multiple events to prevent a single breach. Some flooding is caused by multiple levees to prevent a single breach.

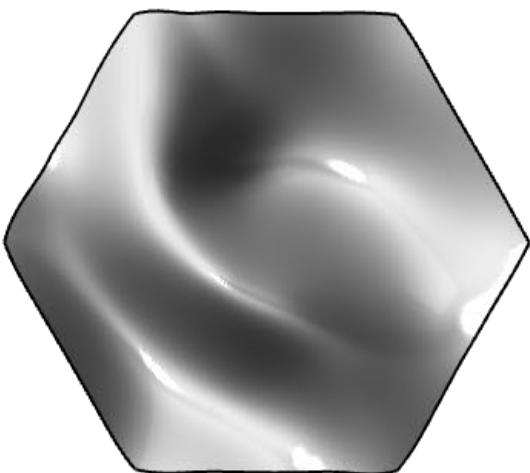




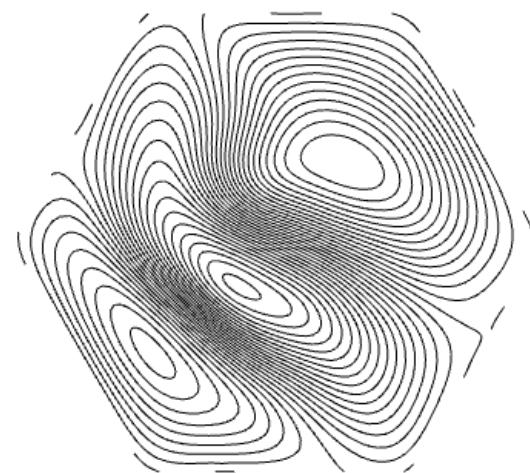




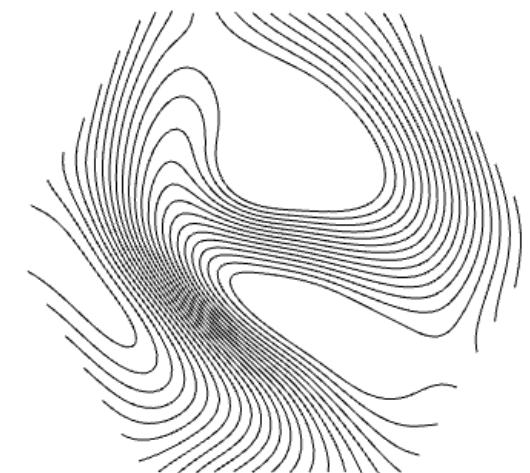
basic curve



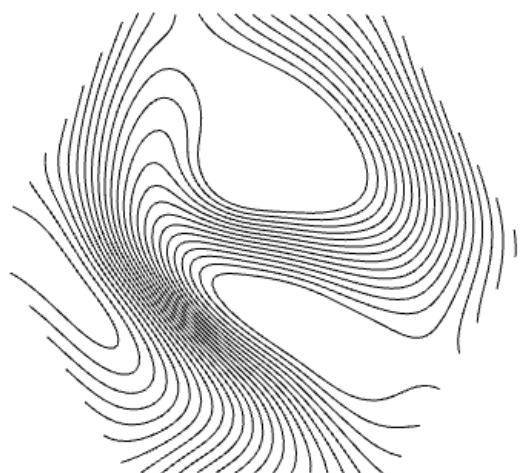
patch



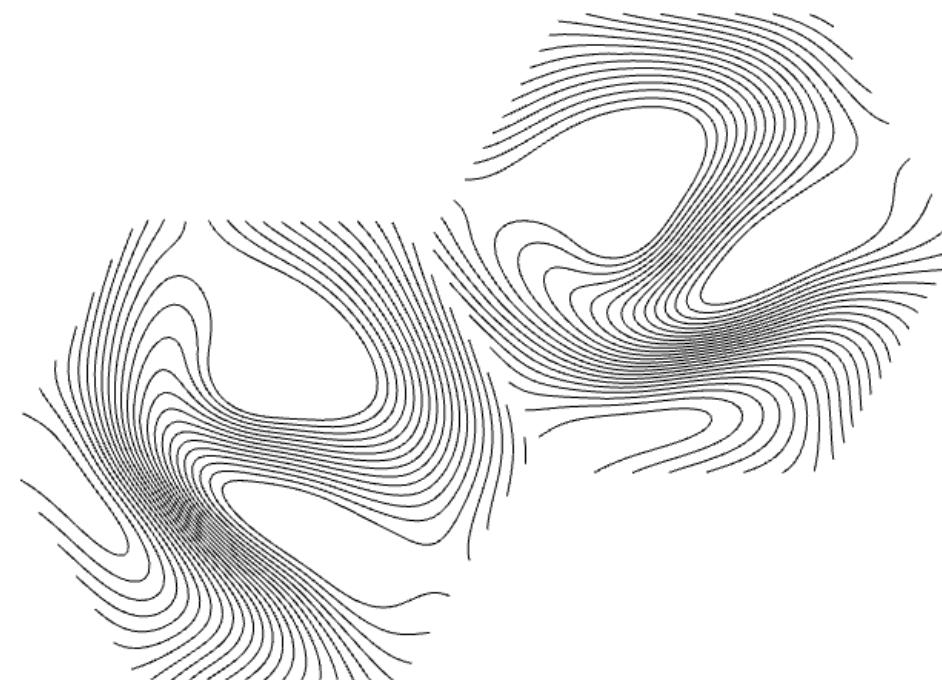
contour



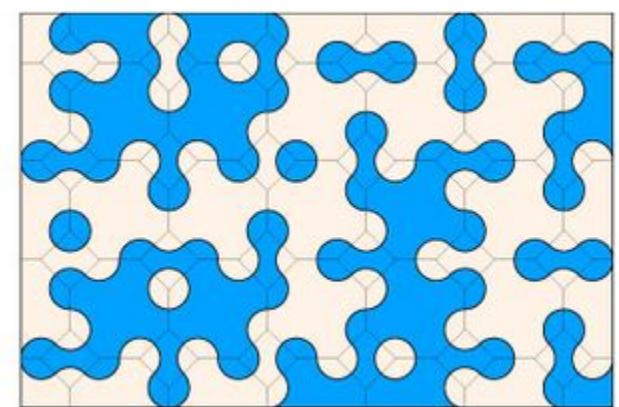
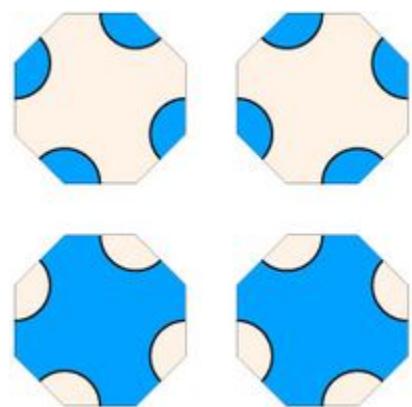
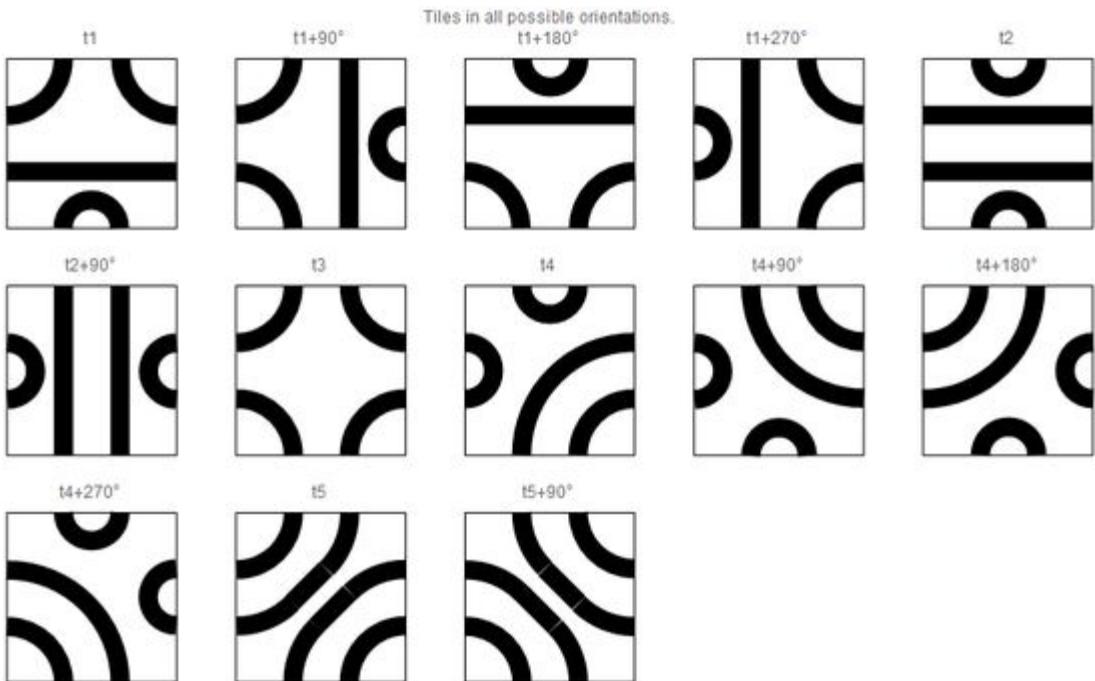
set point



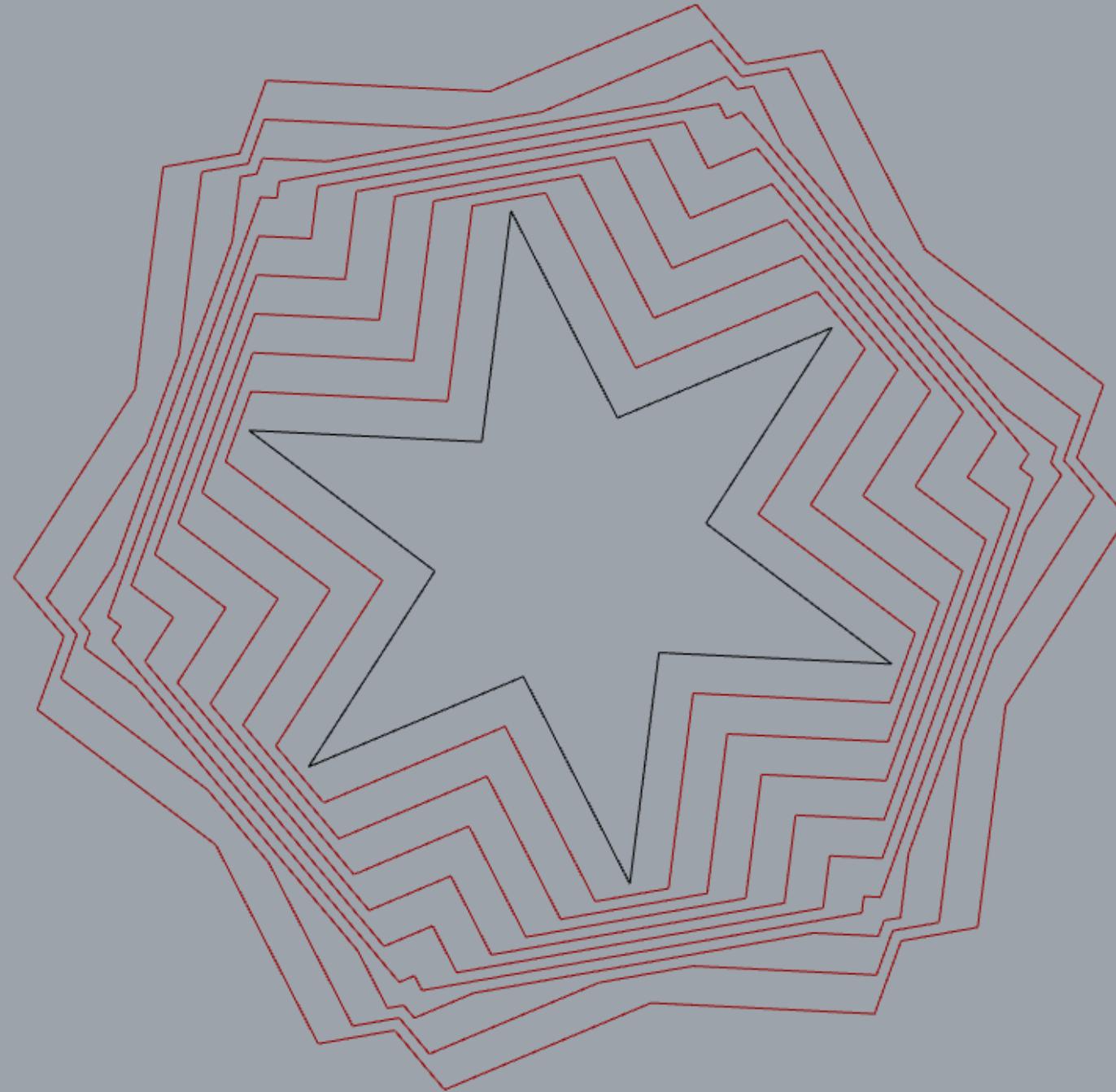
unit

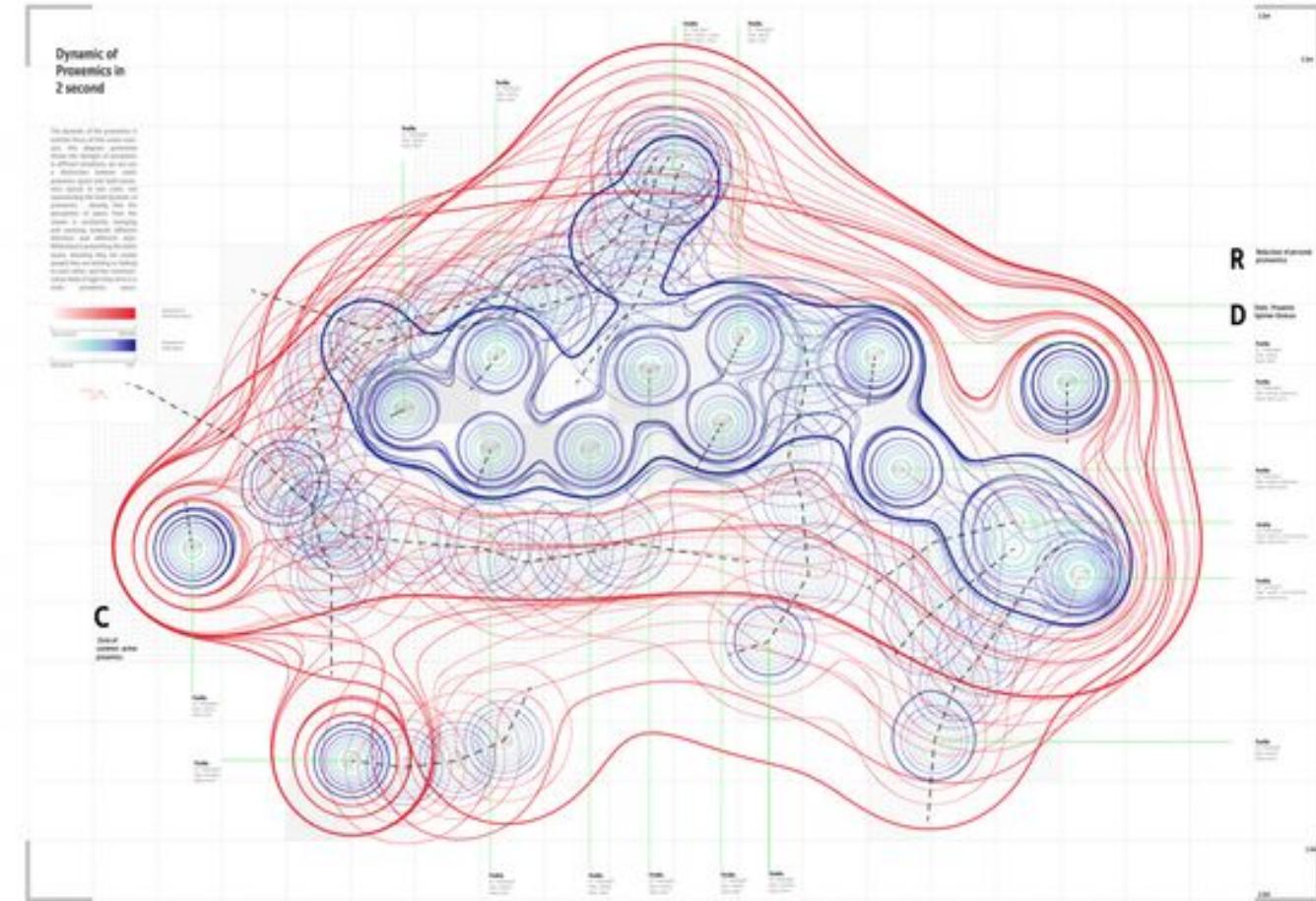
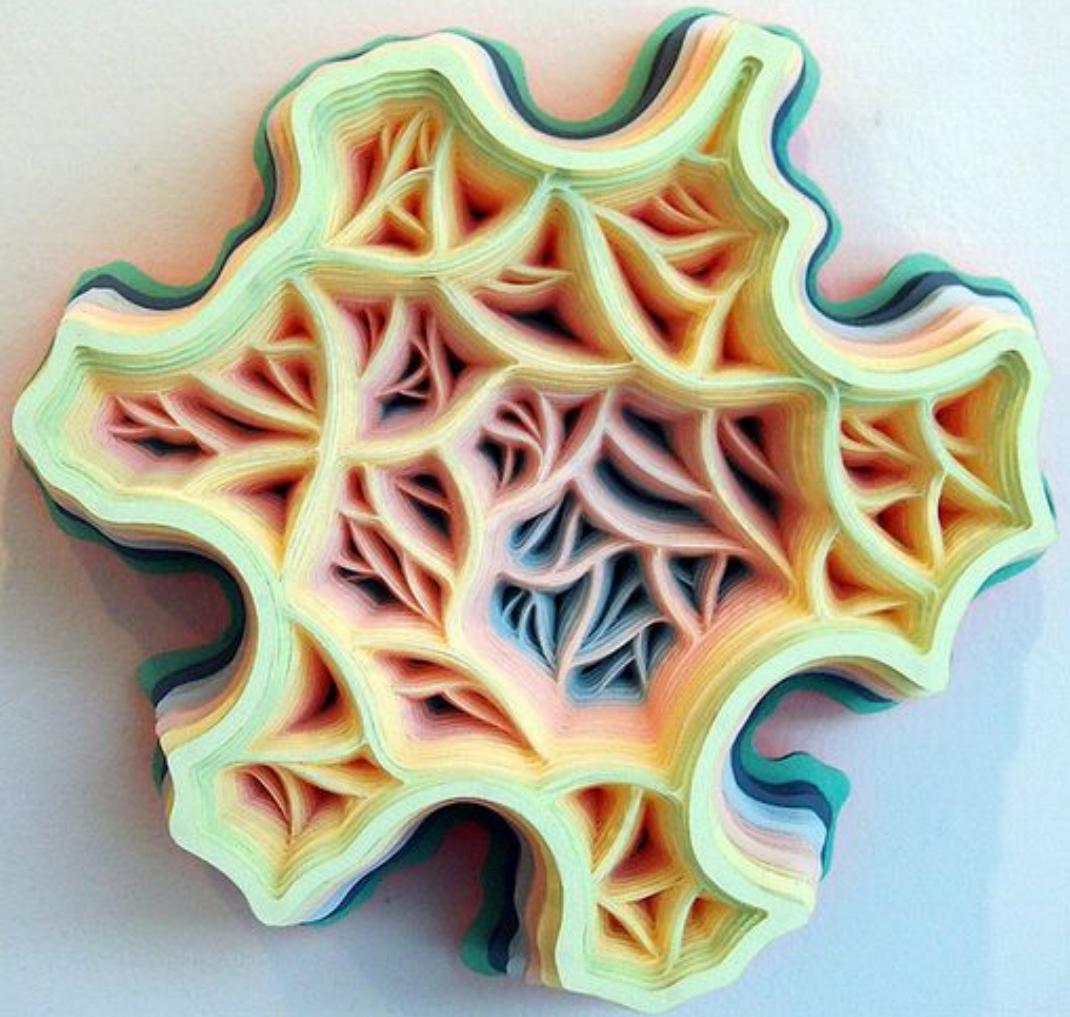


module



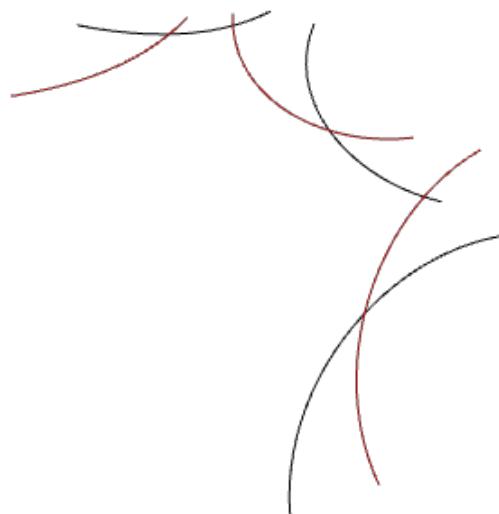
Truchet Tiles



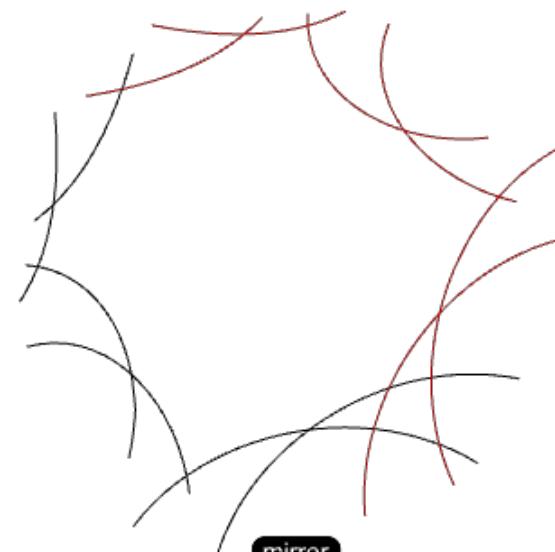




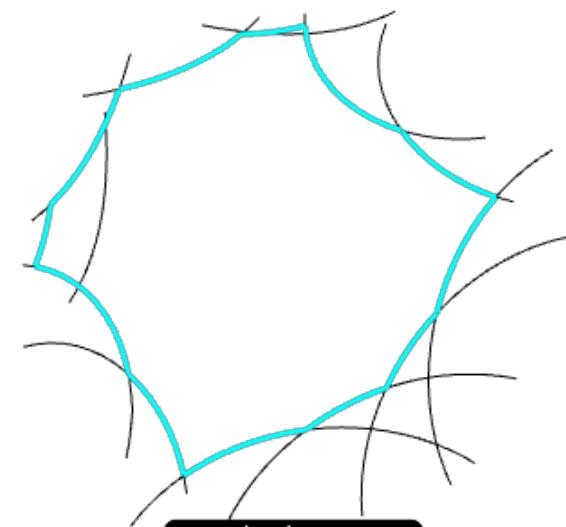
basic curve



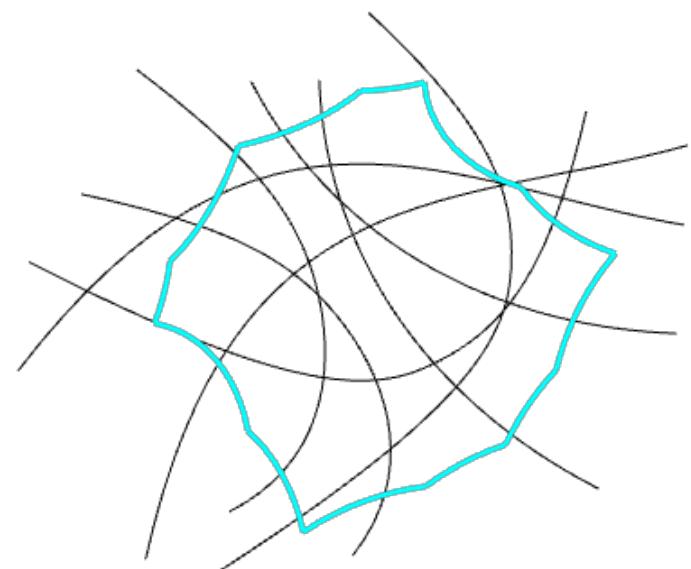
rotate



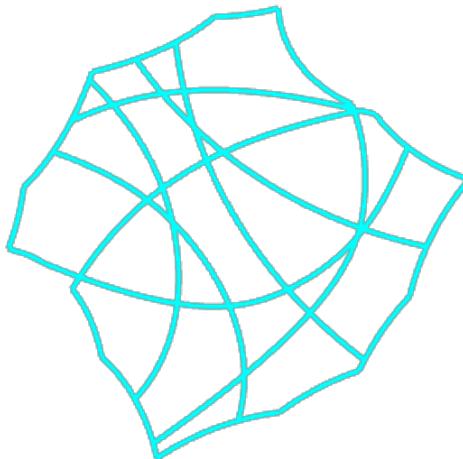
mirror



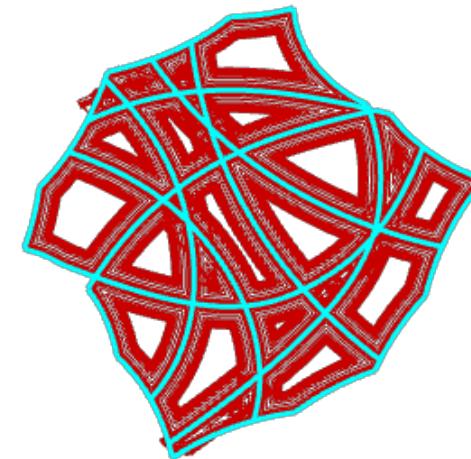
curve boolean
combine region=YES



curve boolean
combine region=NO



offset



offset

