

## generating form

defining contextual parameter settings in rhino

V: max. volume of construction  
pos: center position of construction  
pF: plane force  
rF: radial force  
fPos: force position  
fDir: force direction  
fVal: force value  
sP: sectionplane  
sPos: sectionplane position

left image variant 1, right image variant n

```
{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}
```

## xml export

initial parameter settings made in rhino are exported as xml-data to be transferred into the JAVA program

```
<?xml version="1.0" encoding="ISO-8859-1"?><contextElements> <center> <point>
<x>36.6452380952632</
x><y>2.7624298713894</y><z>-4.30625002384182</z> </point> </center> <volume>19.2216796875</volume>
<planeForces> <planeForce> <plane> <point> <x>36.3327392215323</x> <y>0.224755102245286</y> <z>-
3.1499999523162</z> </point> <point> <x>36.3327392215323</x> <y>0.224755102245286</y> <z>-
5.1499999523162</
z> </point> <point> <x>38.3327392215323</x> <y>0.224755102245286</y> <z>-3.1499999523162</z> </
point> <point> <x>38.3327392215323</x> <y>0.224755102245286</y> <z>-5.1499999523162</z> </point> </
plane> <direction> <point> <x>37.3327392215323</x> <y>0.224755102245286</y> <z>-4.1499999523162</z>
</point> <point> <x>37.3327392215323</x> <y>0.724755102245287</y> <z>-4.1499999523162</z> </point>
</direction> </planeForce> <planeForce> <plane> <point> <x>35.8</x> <y>1.3249298713894</y> <z>-
6.20983140254804</z> </point> <point> <x>35.8</x> <y>3.3249298713894</y> <z>-6.20983140254804</z> </
point> <point> <x>37.8</x> <y>1.3249298713894</y> <z>-6.20983140254804</z> </point> <point> <x>37.8</
x> <y>3.3249298713894</y> <z>-6.20983140254804</z> </point> </plane> <direction> <point> <x>36.8</x>
<y>2.3249298713894</y> <z>-6.20983140254804</z> </point> <point> <x>36.8</x> <y>2.3249298713894</
y> <z>-5.70983140254804</z> </point> </direction> </planeForce></planeForces> <sectionPlanes> <sectionPlane>
<plane> <point> <x>35.5202387710247</x> <y>1.3249298713894</y> <z>-5.14999999999994</z>
</point> <point> <x>35.5202387710247</x> <y>3.3249298713894</y> <z>-5.14999999999994</z> </point>
<point> <x>37.5202387710247</x> <y>1.3249298713894</y> <z>-5.14999999999994</z> </point> <point>
<x>37.5202387710247</x> <y>3.3249298713894</y> <z>-5.14999999999994</z> </point> </plane> <direction>
<point> <x>36.5202387710247</x> <y>2.3249298713894</y> <z>-5.14999999999994</z> </point>
<point> <x>36.5202387710247</x> <y>2.3249298713894</y> <z>-4.64999999999994</z> </point> </direction>
</sectionPlane> <sectionPlane> <plane> <point> <x>37.5202387710269</x> <y>0.904535875098199</
y> <z>-5.149999999999773</z> </point> <point> <x>37.5202387710247</x> <y>0.9045358750982</y>
<z>-3.149999999999773</z> </point> <point> <x>35.5202387710269</x> <y>0.904535875100413</y> <z>-
5.14999999999994</z> </point> <point> <x>35.5202387710247</x> <y>0.904535875100414</y> <z>-
3.14999999999994</z> </point> </plane> <direction> <point> <x>36.5202387710258</x> <y>0.904535875099306</
y> <z>-4.149999999999884</z> </point> <point> <x>36.5202387710263</x> <y>1.40453587509931</y> <z>-
4.149999999999884</z> </point> </direction> </sectionPlanes></sectionPlanes> </contextElements>
```

parameter settings in JAVA

g: growspeed

a: attraction of cells

skin: parameters for outer cells

void: parameters for inner cells

A: attraction

V: volume

S: spacing

P: padding

D: density

left image variant 1, right image variant n

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

java : step 1 > import initial data

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

java : step 2 > run generating procedure

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

java : step 3 > adjust parameter settings

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

java : step 4 > adjust parameter settings

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

java : step 5 > generate voronoi graph

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

java : step 6 > clean angles of voronoi graph

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}

java : step 7 > activate section plane

{mosimage ch=180 popup=1 popupTyp=script} {mosimage ch=180 popup=1 popupTyp=script}



java : step 8 > export final geometry

#### xml export

Each variant is defined by points in space and its connection lines. These coordinates and relations are stored in the xml-file.

```
<geometry><cells><cellNumbers>51</cellNumbers><maxCellID>51</maxCellID><cell><id>15</  
id><type>2</type><x>0.4978515601239075</x><y>0.5082835951855659</y><z>1.4941755020462701</z><  
radius>0.2590016776631268</radius></cell><cell><id>30</id><type>2</type><x>-1.3175845940859239</  
x><y>1.9329915908972664</y><z>-0.006543727561870938</z><radius>0.25900286701300174</radius></  
cell><cell><id>43</id><type>2</type><x>-1.2041976303158068</x><y>-0.6741486238055946</y><z>0.08  
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0.2785534973436557</x><y>0.8577071987147005</y><z>0.1784957190423354</z><radius>0.25900286701300174</  
radius></cell><cell><id>31</id><type>2</type><x>1.4146719221773192</x><y>-0.19056895820133898</  
y><z>2.4925483207091492</z><radius>0.2590024365483124</radius></cell><cell><id>48</id><type>2</  
type><x>0.5669101266363555</x><y>2.1832280432945104</y><z>1.9055364205249854</z><radius>0.25218510842  
5511</radius></cell><cell><id>32</id><type>1</type><x>0.2633802611197716</x><y>-0.6242535919951099</  
y><z>0.22998228926547037</z><radius>0.3051019750326249</radius></cell><cell><id>34</id><type>2</  
type><x>1.4532962866054593</x><y>1.30242764871002</y><z>-1.0463064521033743</z><radius>0.2536890541579
```

636</radius></cell><cell><id>41</id><type>2</type><x>-2.0916012339526335</x><y>-1.4675317035390092</y><z>-0.39116037693207883</z><radius>0.25317570955789964</radius></cell><cell><id>1</id><type>2</type><x>-1.3018243351615104</x><y>0.5684649336900619</y><z>3.323959134515669</z><radius>0.2590032972919388</radius></cell><cell><id>49</id><type>2</type><x>-1.0951177720464824</x><y>-0.8001131280529562</y><z>3.0857686035065877</z><radius>0.2521442844329993</radius></cell><cell><id>22</id><type>1</type><x>-0.1766293855184261</x><y>-0.8356810313749607</y><z>0.23387585192235816</z><radius>0.18351091722327986</radius></cell><cell><id>9</id><type>2</type><x>-1.1383774324984506</x><y>-0.0016420320339397335</y><z>1.262862475503044</z><radius>0.2590001738453743</radius></cell><cell><id>21</id><type>2</type><x>-0.670872673161631</x><y>-2.193767301747266</y><z>1.8884150420564922</z><radius>0.2531400377542216</radius></cell><cell><id>33</id><type>2</type><x>0.26440115715904106</x><y>2.172098539557047</y><z>-0.6113859982009129</z><radius>0.2546308594308054</radius></cell><cell><id>6</id><type>2</type><x>-2.0222321348592707</x><y>-1.4782420480155412</y><z>1.2826030457072197</z><radius>0.25317570955789964</radius></cell><cell><id>24</id><type>2</type><x>1.826544608962184</x><y>1.1994031054991556</y><z>1.827695785760122</z><radius>0.2590024718852166</radius></cell><cell><id>42</id><type>2</type><x>-0.7277149618636248</x><y>-1.3784618127317003</y><z>0.8858954858602841</z><radius>0.2531400377542216</radius></cell><cell><id>4</id><type>2</type><x>-2.232038063934722</x><y>1.0911258861658844</y><z>1.059737165188674</z><radius>0.2590037273852033</radius></cell><cell><id>19</id><type>2</type><x>1.8017550714409059</x><y>-1.5665808621710062</y><z>0.4149928385087055</z><radius>0.25331657352047743</radius></cell><cell><id>36</id><type>2</type><x>-0.3346835655127254</x><y>-0.2095082984761358</y><z>-0.7757601299194163</z><radius>0.2533513383042367</radius></cell><cell><id>26</id><type>2</type><x>0.8176048579904788</x><y>-0.21671336408153744</y><z>-1.6548486887031295</z><radius>