

programming

A program written in the “java” programming language generates the geometry of the structure by incorporating selected parameters. The designer can control the form finding process directly by changing and adjusting the values. A three-dimensional wire frame model visualizes the result and displays the geometry of the structure in real-time. The generation process is based on the principle of cellular automata. The cells are following few simple rules to coordinate their growth. The development of a singular cell depends on the condition of the adjacent cell. The spheres shown in the interface represent the cellular hollow bodies of the structure. They are enclosed by tangential planes whose intersecting edges form the physical edges of the construction system.

The designer determines the maximum volume of the construction as well as the number of cells and defines a particular value for the minimal and maximal length of the structure. With the help of force vectors it is additionally possible to control the distribution of density within the whole structure. The program allows the organisation of the cells according to the predefined coefficients. If, for example, the maximum length of one tangential edge is exceeded, the affected cell will divide and spawn an additional cell. This process will continue until the system stabilises. The designer is able to constantly vary the input and thus create a multitude of possible variants. The programmed model is accurately defined by points in 3D-space. After reaching the desired form, the geometric data is translated in a generic data description, a XML-file, and can be passed on to other software.

Definable parameters in JAVA:

- max. size of the structure
- number of spheres
- number of points
- min. und max edges
- force vector: direction°ree
- attraction/distribution of spheres
- padding of space
- radius of impact
- gravity sectional plane