

SIMULATING MORPHOGENESIS

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The complex organic forms we find in nature are typically difficult to geometrically model using traditional 3D modelling tools. This is because they often have complex surfaces and large number of components, which are tedious to create when manipulating the geometric model directly. One approach to this problem is to generate the geometry through simulation. The Simplicial Developmental System (my PhD research project) synthesizes virtual organic forms by simulating some biological and physical processes of morphogenesis [1]. Early results indicate that the system is capable of generating organic geometry with complex surfaces and symmetries. An example simulation demonstrates that from a simple starting shape a starfish-like form develops (Figures 1 and 2).

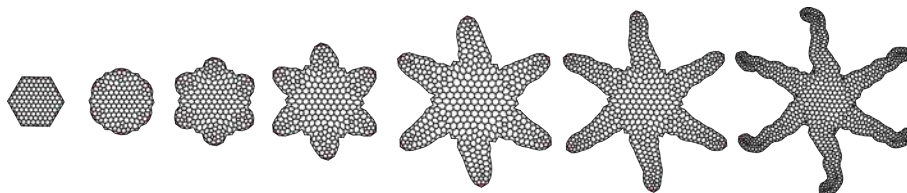


FIGURE 1. The developmental sequence of a growing form. Starting as a hexagon six limbs grow outwards, resulting in a starfish-like form.

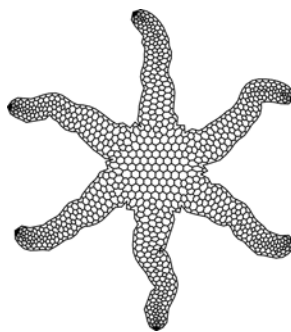


FIGURE 2. A close-up of the final form from Figure 1.

REFERENCES

- [1] Ben Porter. A Developmental System for Organic Form Synthesis. Technical Report 2009/245, Monash University, Clayton School of Information Technology, July 2009.