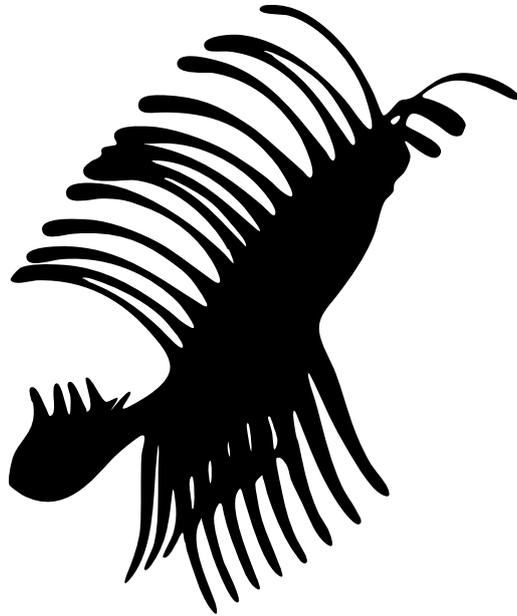


GMP

Generative Modeling Project

Shigeto Maeda

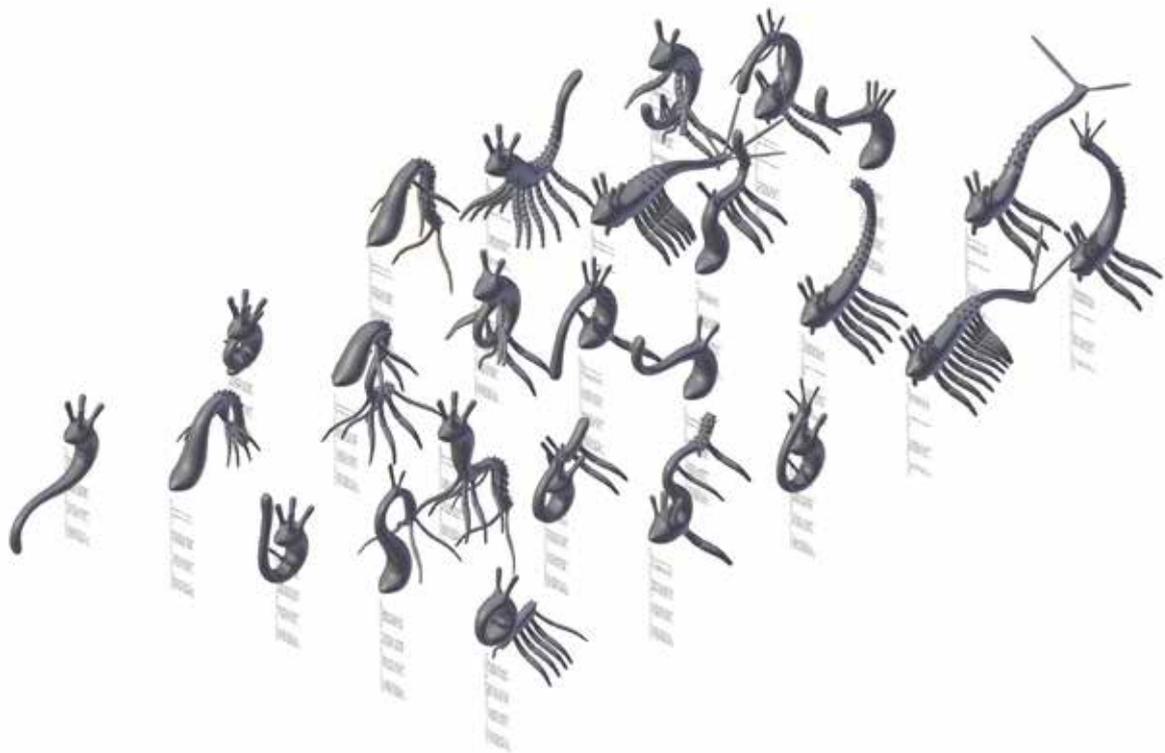


Introduction

As part of Generative Art, GMP (Generative Modeling Project) is intended to generate a 3D object automatically.

There are various ways to edit the object in the 3D software, but in the case of polygonal models generally be created using the function of the extrusion and moving a face that has been selected. It was thought that if the repetition of these operations generally, and either not able to generate a 3D object by performing select and move, extrusion, for face automatically with programs.

Python is a common programming languages have become available to Blender that are usually used, the automatic generation of the object is possible by using the API. Variations of the embodiment varies infinitely by varying manually or automatically some parameters. Those selected form some among them, was materialized in 3D printing is this work.



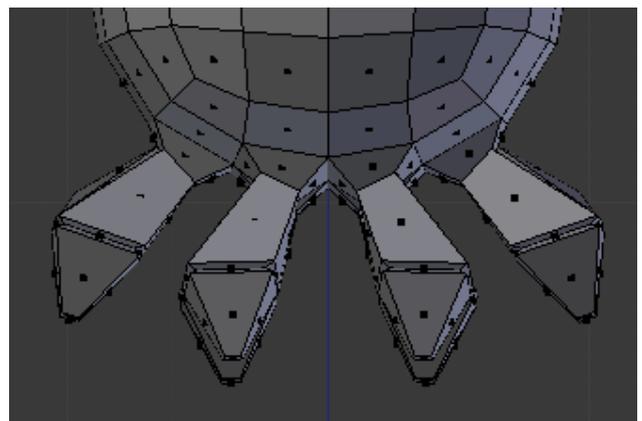
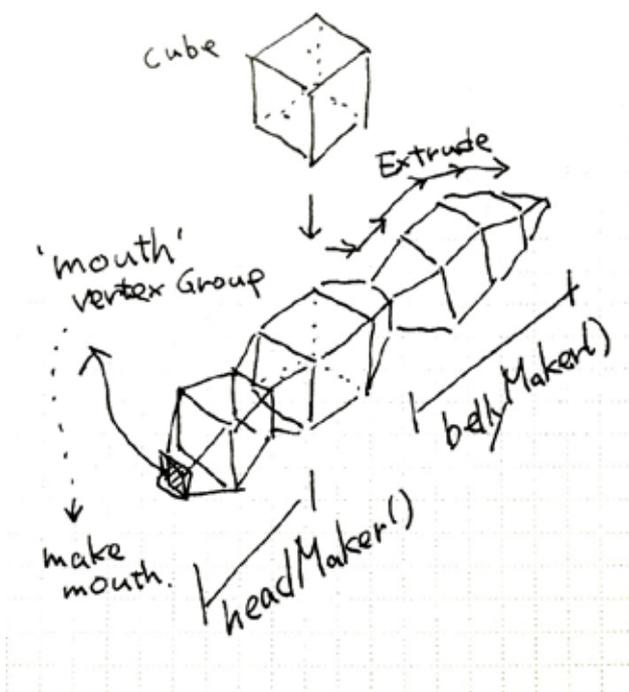
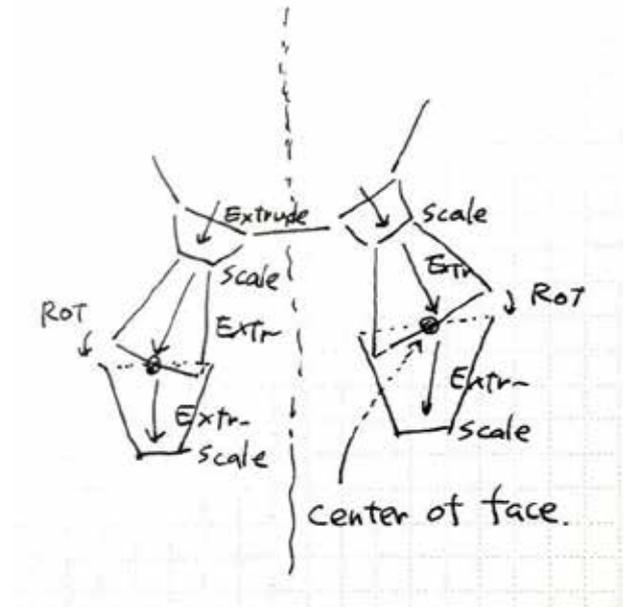
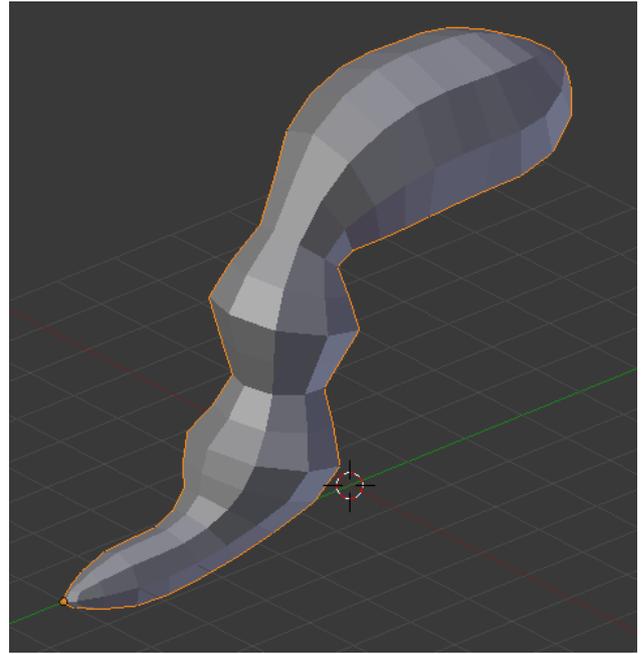
GMP1

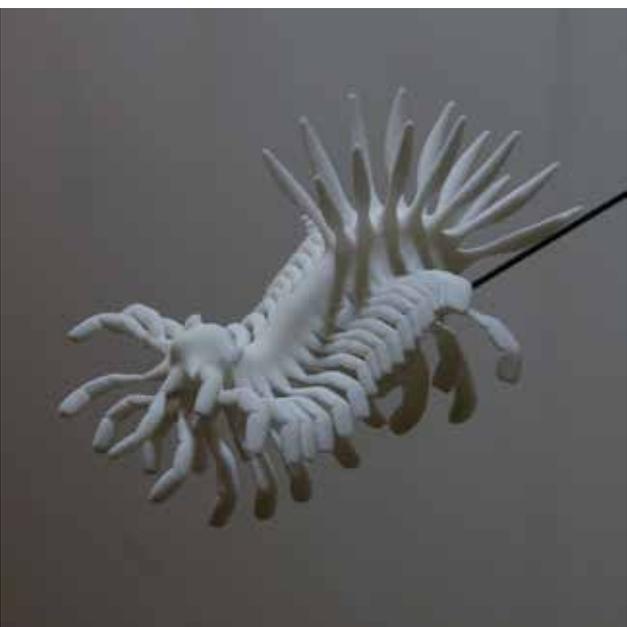
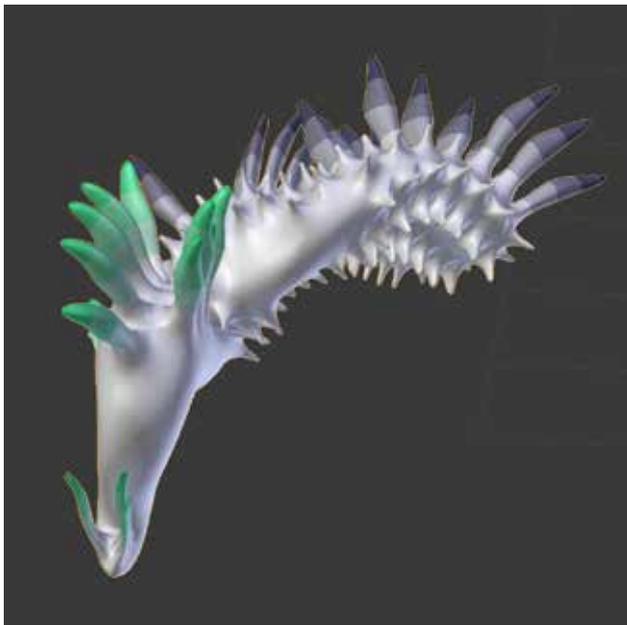
Generative Modeling of the basic idea is simple. Underlying Plane to create a body extruded several times over, by repeating the extrusion and resize it by selecting a part from the fuselage, which can grow some horns, arms and legs.

And the parameters for number of extrusion and bent are create from Date data, and the UI, such as generated by Python was to make it easier to adjust by slider, but the parameters for selecting the part of the body was written in the code directly.

Control of scale and orientation of the extruded face, which is calculated by the complex sine curve. This curve has become a kind of frequency modulation, produced various forms of variation in the parameters to adjust the phase and amplitude.

The goal of GMP I is to learn the basic techniques such as extrusion or rotation. Further deepen the results obtained in the GMP I, generation of biological form like more is now possible.





GMP2

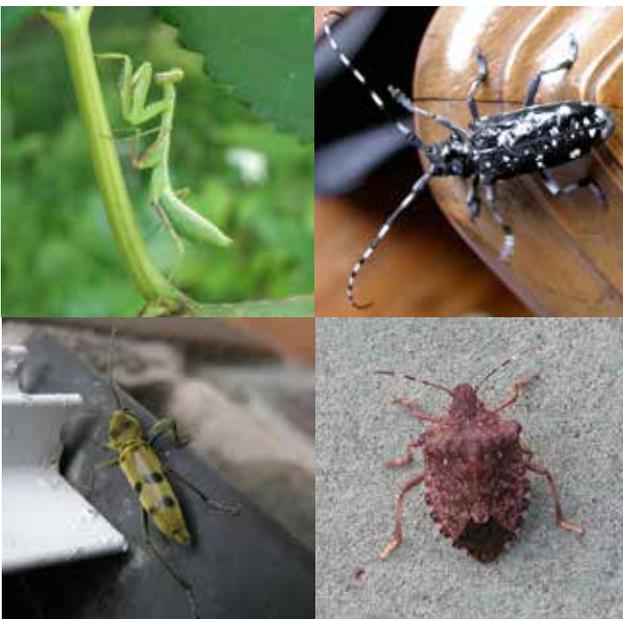
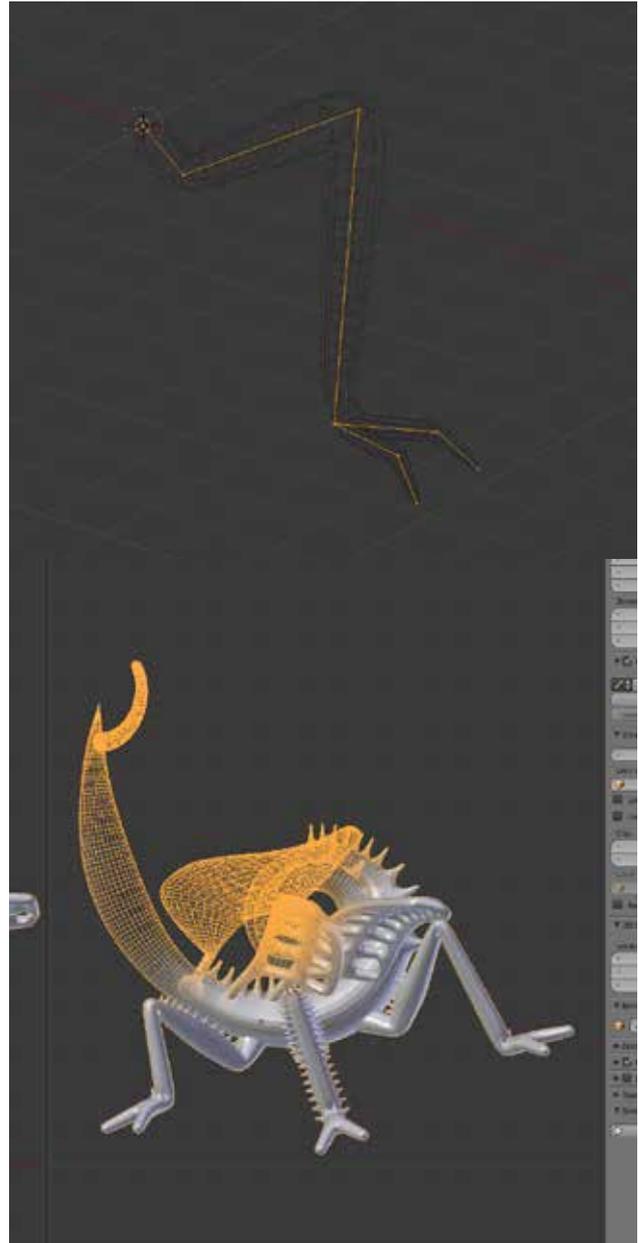
GMP1 has the potential to generate a variety of forms, but to generate a regular form such as insects is difficult. In GMP1 code, the nums of legs are decided automatically. So, I couldn't control the numbers for pair of legs. And to make the forks shape like a fingers on the legs is also a weak point. I had to solve two problems.

(1) Create the objects separate from the body, and join later.

(2) Using other methods for making a fork.

(1) was solved as once exit to OBJECT MODE, and add a object in the script. (2) was solved by using the SKIN MODIFIER. This modifier is very useful and easy for making a forks shape as the fingers.

I added these functions, and to be able to specify the location of the wings and legs. Now, I can get (strange) insect shape.



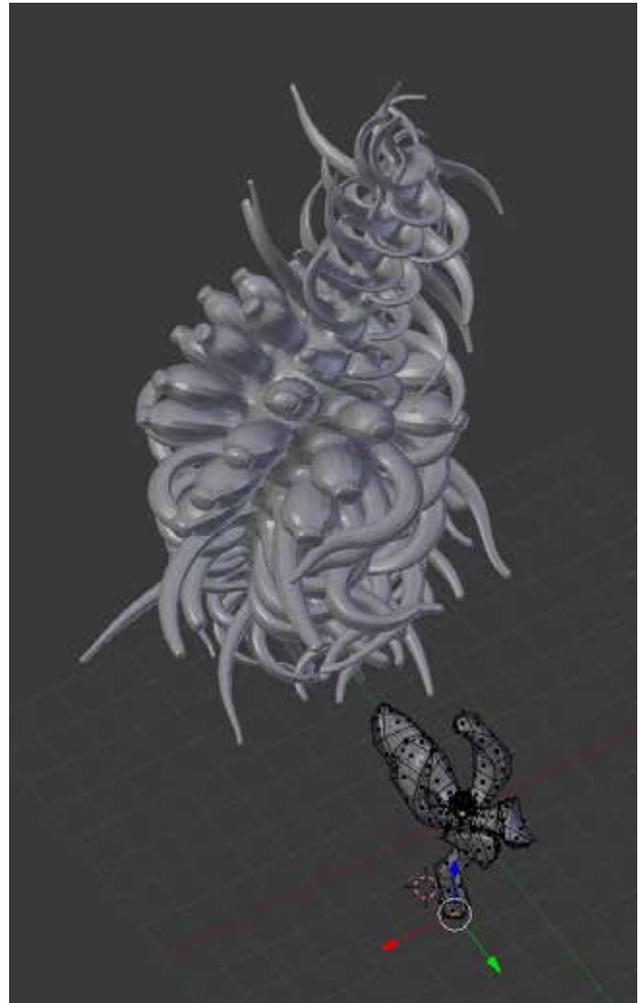
GMP3

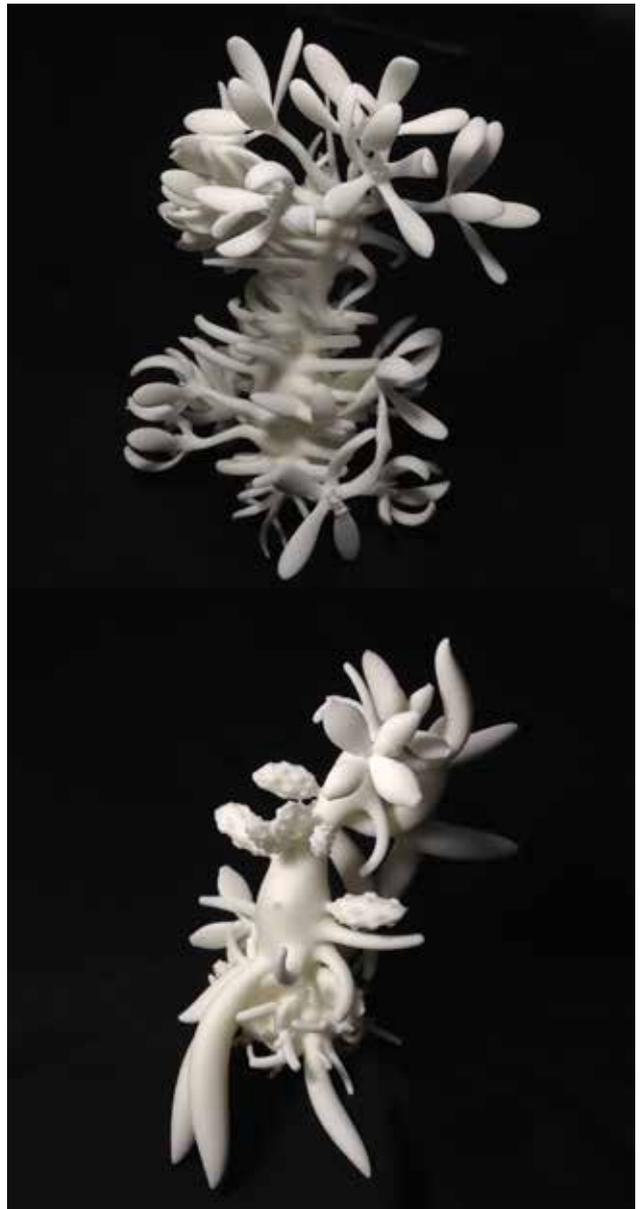
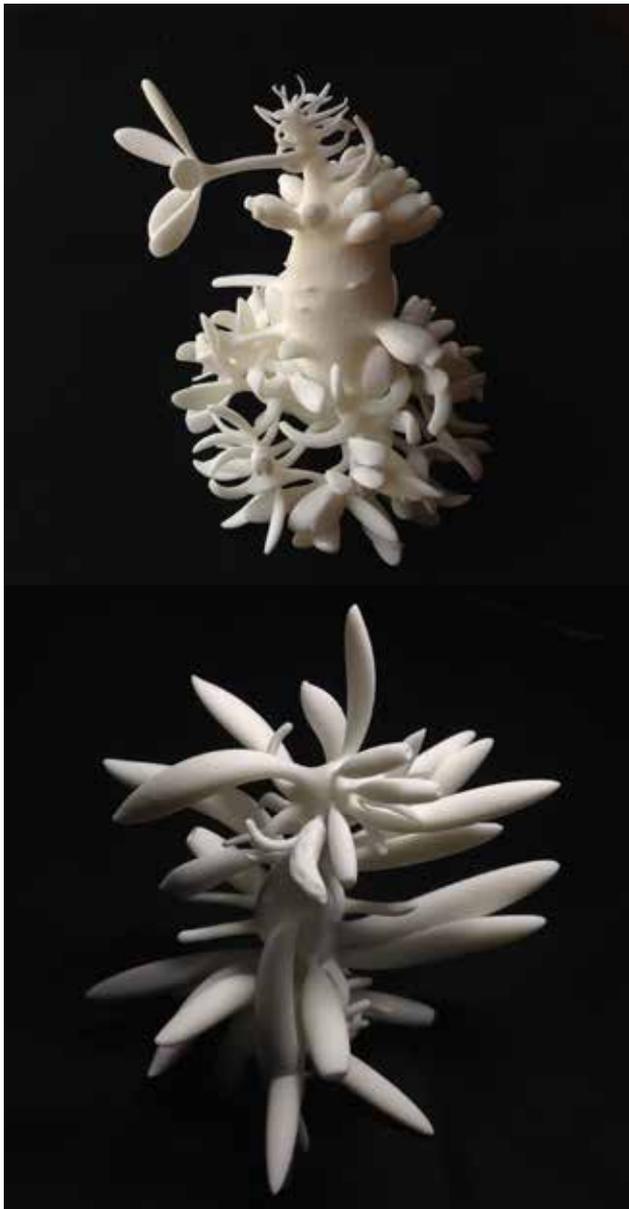
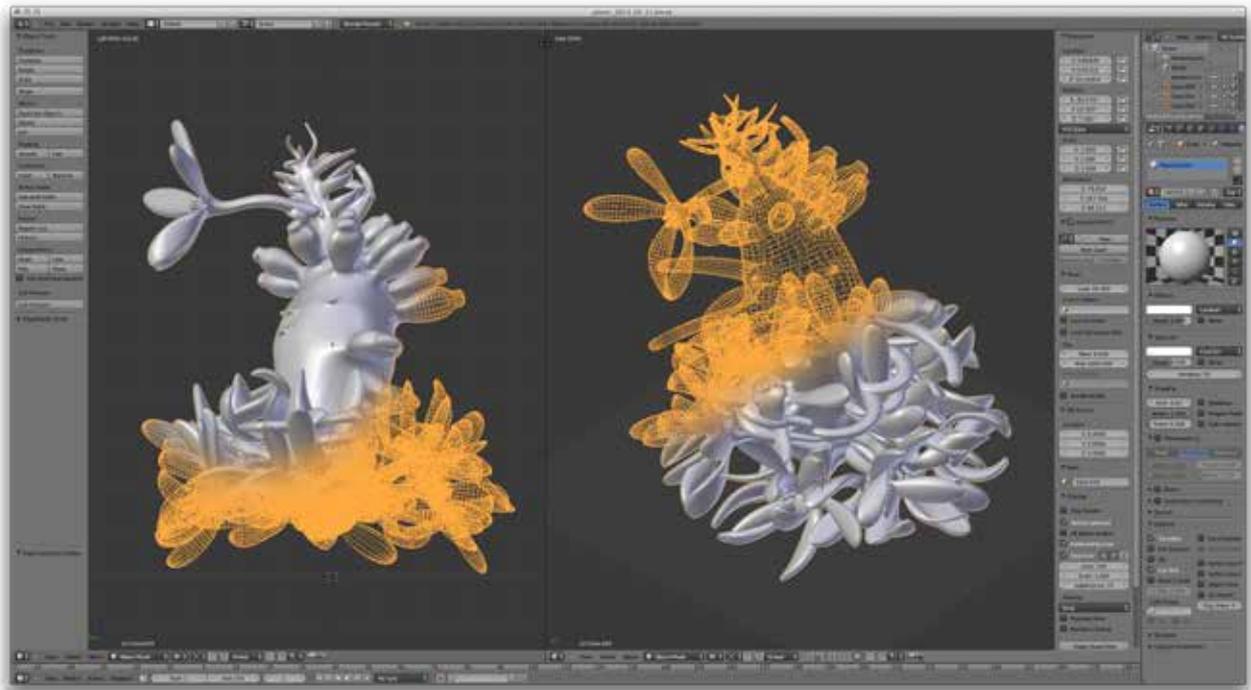
GMP2, was surely generated the form as it aimed. But, I felt something boring. It's too planned. The fun of this project, is that the form which is not envisioned is produced. I have to aim at it. I decided to have a technical success in GMP2, the process proceeds to the next phase.

The Plants is a wide variety. From very small to larger ones to have inhabited and adapt to the environment. Looking at partially, flowers, seeds, leaves, roots. I would admire its stunning form. Among them, succulent is very interesting for the shape, and the way of growth.

How can I make this complex structure.

Flower, has some petals. In the process until GMP I, couldn't make the flower petals of odd in the middle of the body. But now, I can use GMP II technique.





GMP4, ... and more

I'm a scuba diver. So, sometimes I go to sea and watch the life under the sea. The sea life are also diverse, and stimulated my creativity.

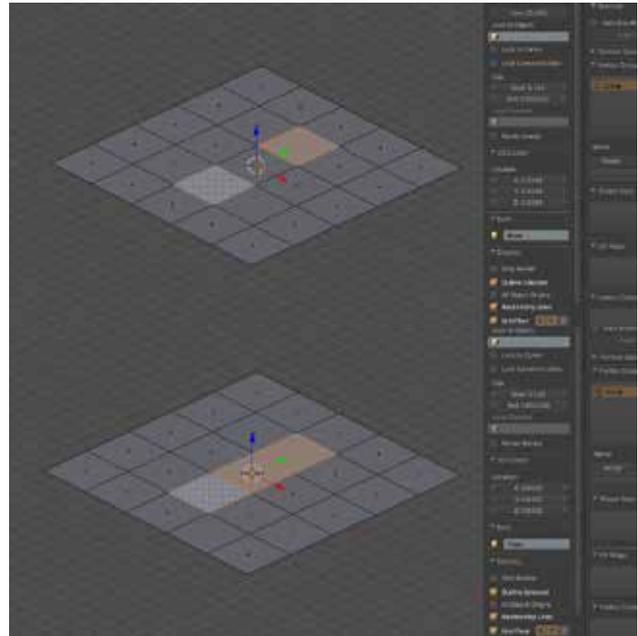
Also coral, there are many kinds, and at the same time to entertain our eyes, it is the habitat of many organisms.



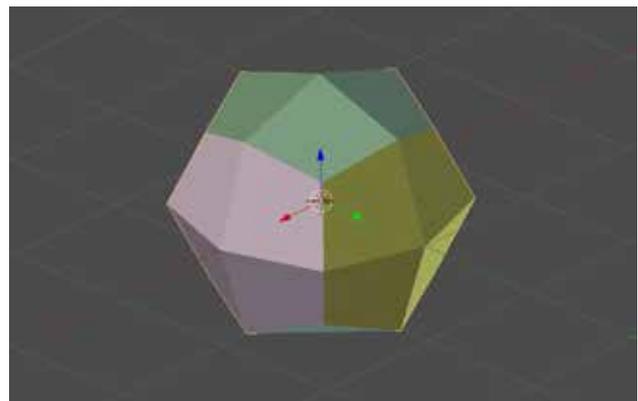
Now, I'm trying to generate something like a 'Coral' structure. But, I had to solve a problem for it. I'm using a 'Vertex Group' for selecting the faces. Of course, it is very useful for usual modeling. Basically GMP operate a 'Face'

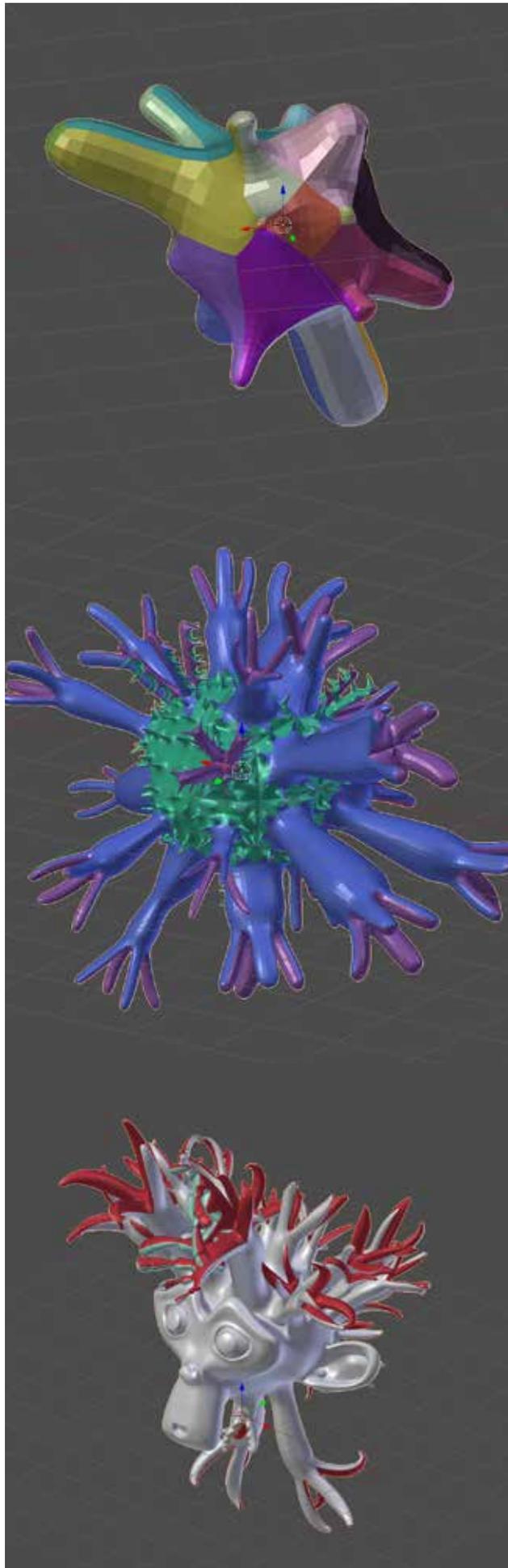
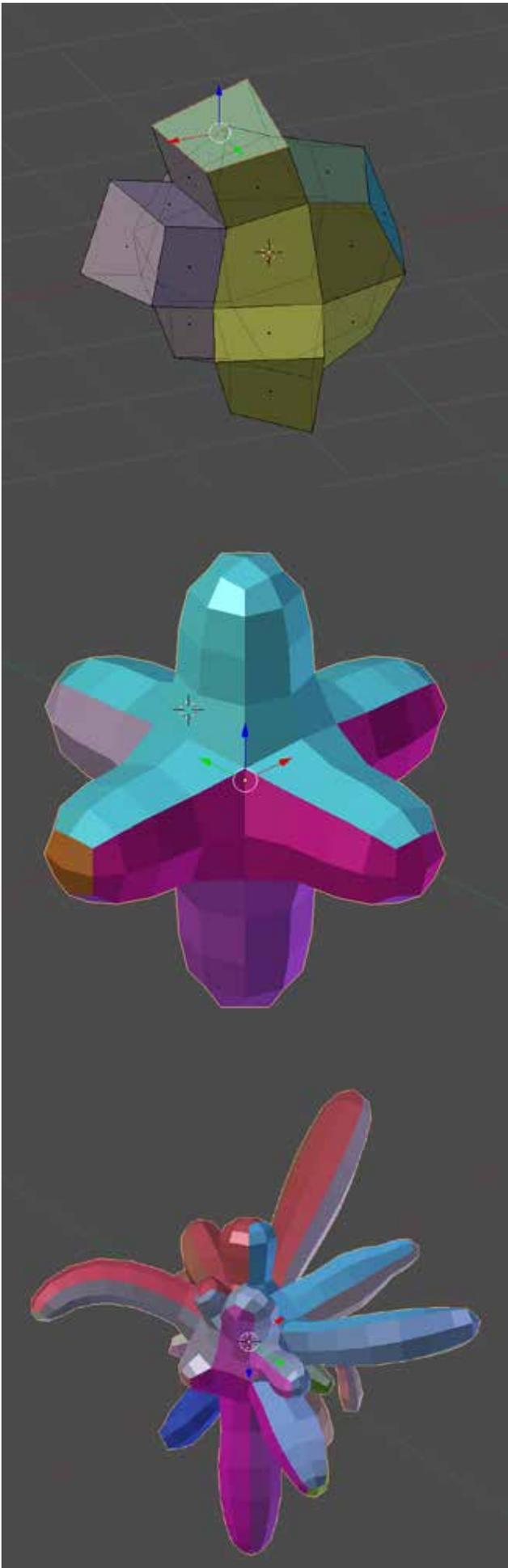


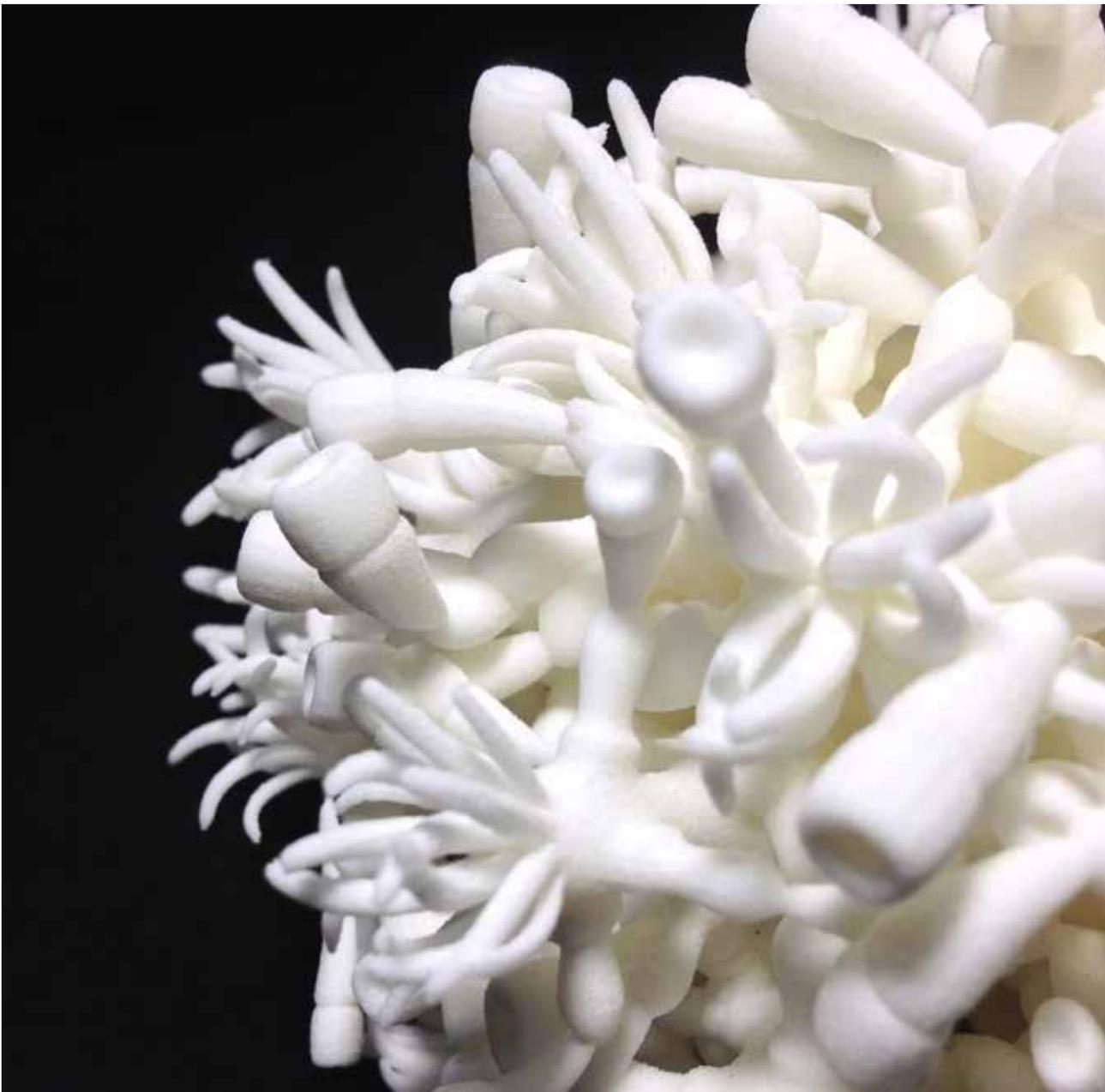
for minimal unit, except in special cases. The problem is, 'Vertex Group' sometimes select unexpected faces. For example, I'd like to record two faces for next modeling. Selecting two faces, make new vertex group, and assign these faces as vertex group.



By a course for four vertices constituting the surface sandwiched between the surface on both sides is selected, the surface itself becomes a target of selection it. But I do not want it. In other ways to register the surface, and can be selected. At last, I found to use 'Material' for it. Assigning the material for necessary, it could be select only the faces that the material was assigned. This method is quite obvious which surface is either further selected. This is the process.







GMP5?

It's too early to tell, but I think the theme will be an object to 'Grow'. I'd like to try it.

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