Crystal Flowers in Halls of Mirrors:
Mathematics Meets Art and Architecture

Team “Dos de Tres”

Task 03

Faezeh Sadeghi

Architecture & Digital Fabrication

Laura Timonen

Journalism & New Media Design

Calvin Guillot

Automation & Generative Art

Perttu Yli-Opas

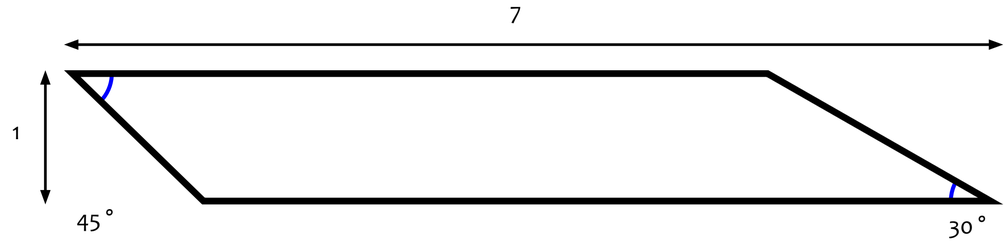
Mathematics & Spacetech

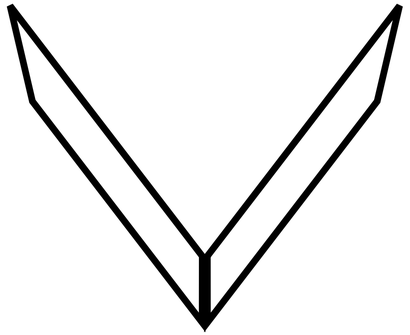
Our proposal is about exploring the duality of ideas. Softness and hardness, light and dark, openess and closeness, artificial and organic. We are interested in expressin the constant push and pull that these ideas have by using mathematicss, art and architecture.

Trillium

The only constant is life is change. We all are in a continuous process of evolution and transformation. Sometimes we are not aware of that process and is only when we reflect that we can see the contrast between where we were, and where we are now.

Trillium is and exploration of the concept of maturing. We want to express how ideas, feeling, experiences, and emotions change over time, and how when we observe those change, we can see that the opposite ends often follow the idea of dualism. Here we use the different in the materials, the difference in density, height, size, perspectives, and the changes in the environment, to showcase those reflections.

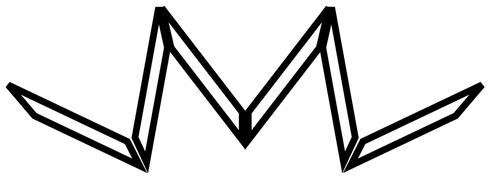


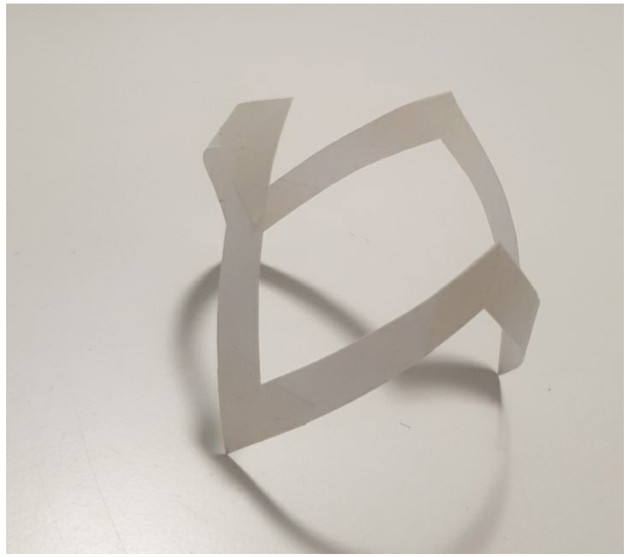


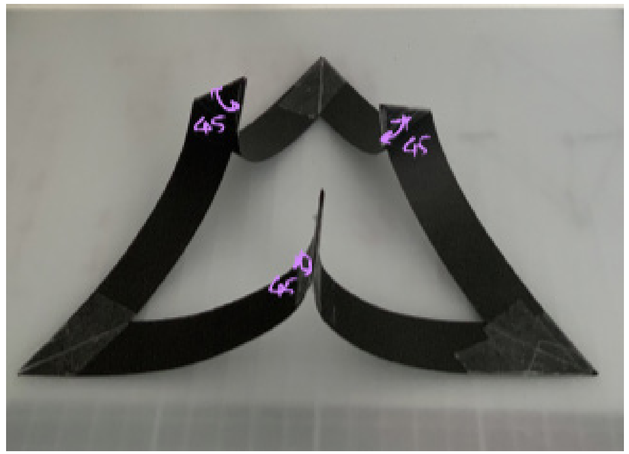
The elemental strip is a skewd rectagular shape that has one 45 degerr angle inclination on one side and 30 degrees on the opposite side. It has a ration of 7:1 for its sides.

We use 2 of them to create a V shape sub module, and 3 of these sub modules to create the basic module.The basic module the, is folded along the 45 degree seam to inver the shape and create a tringular curve element.

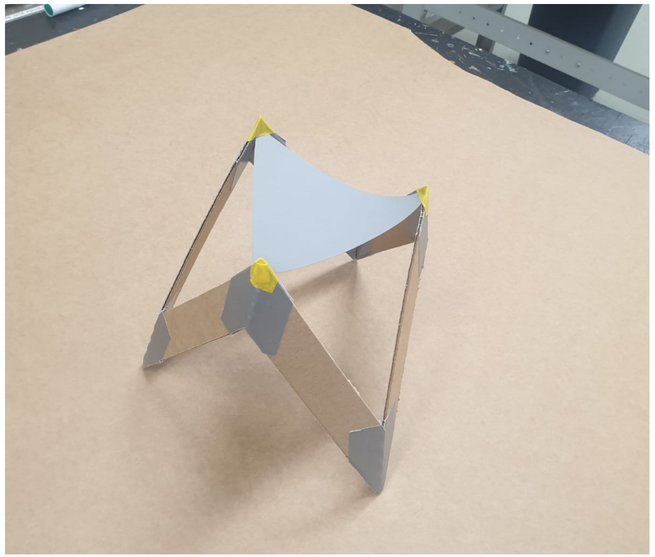
The module is joined with its mirror image, thus becoming the main component

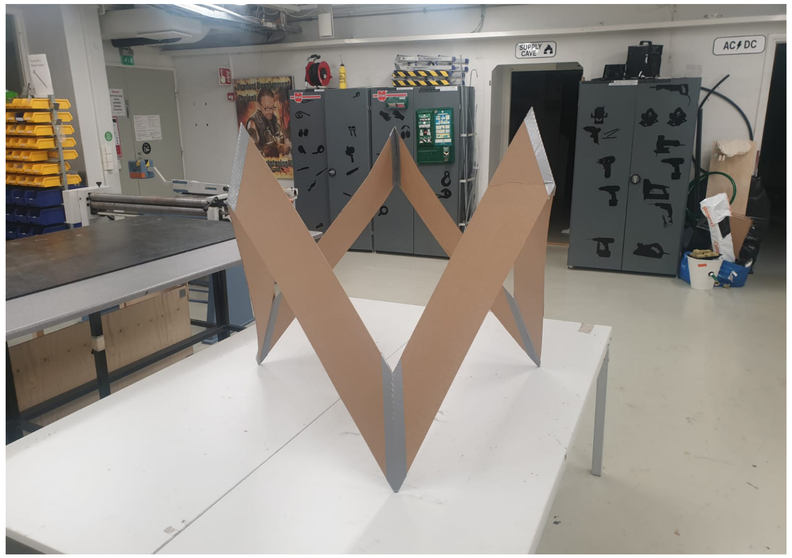


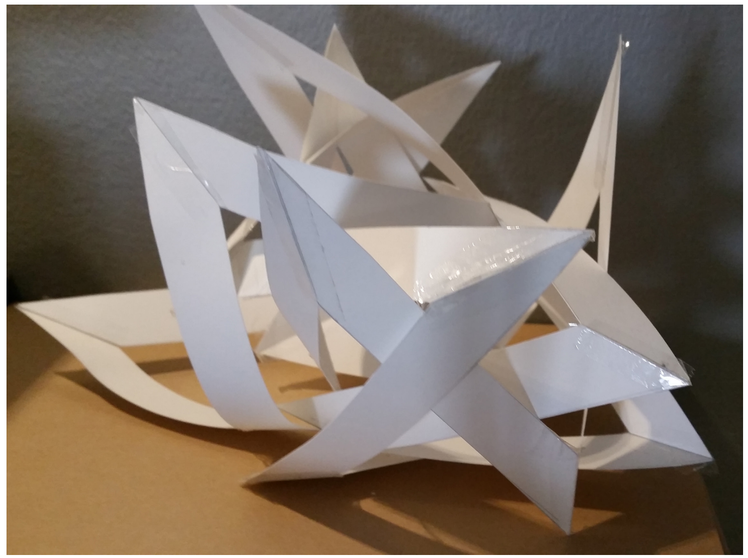


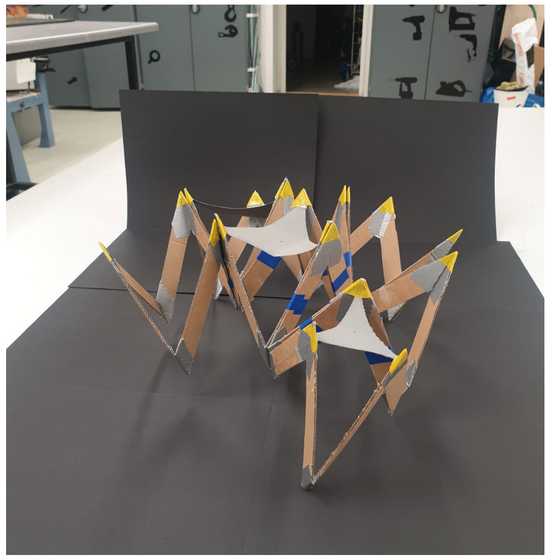


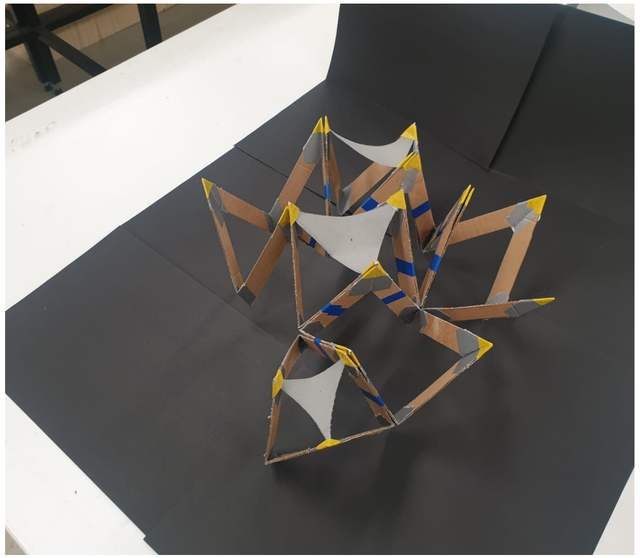
Implementation



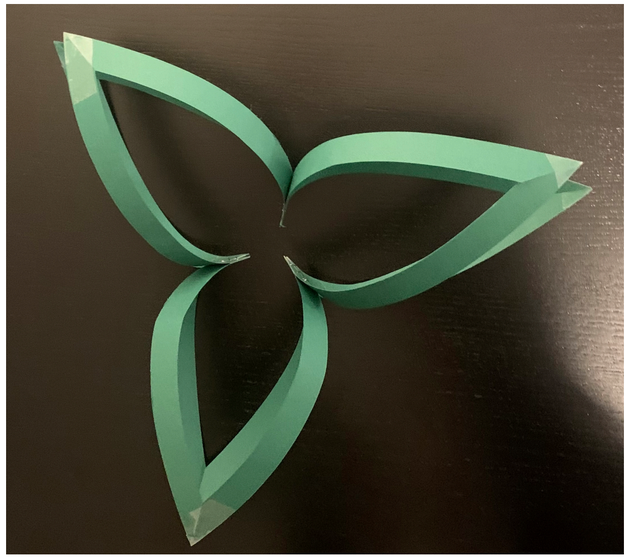


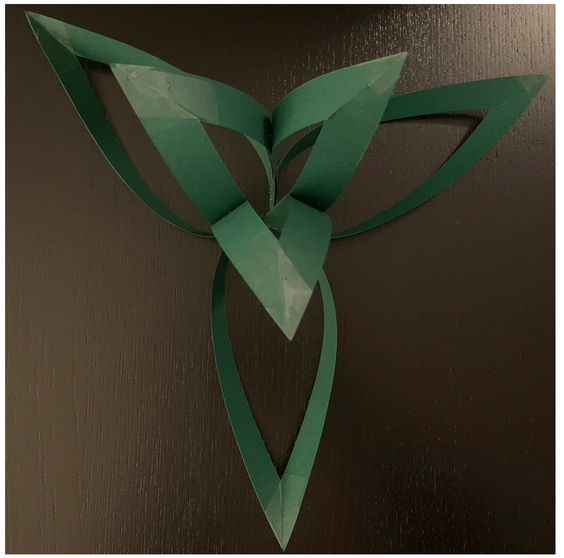




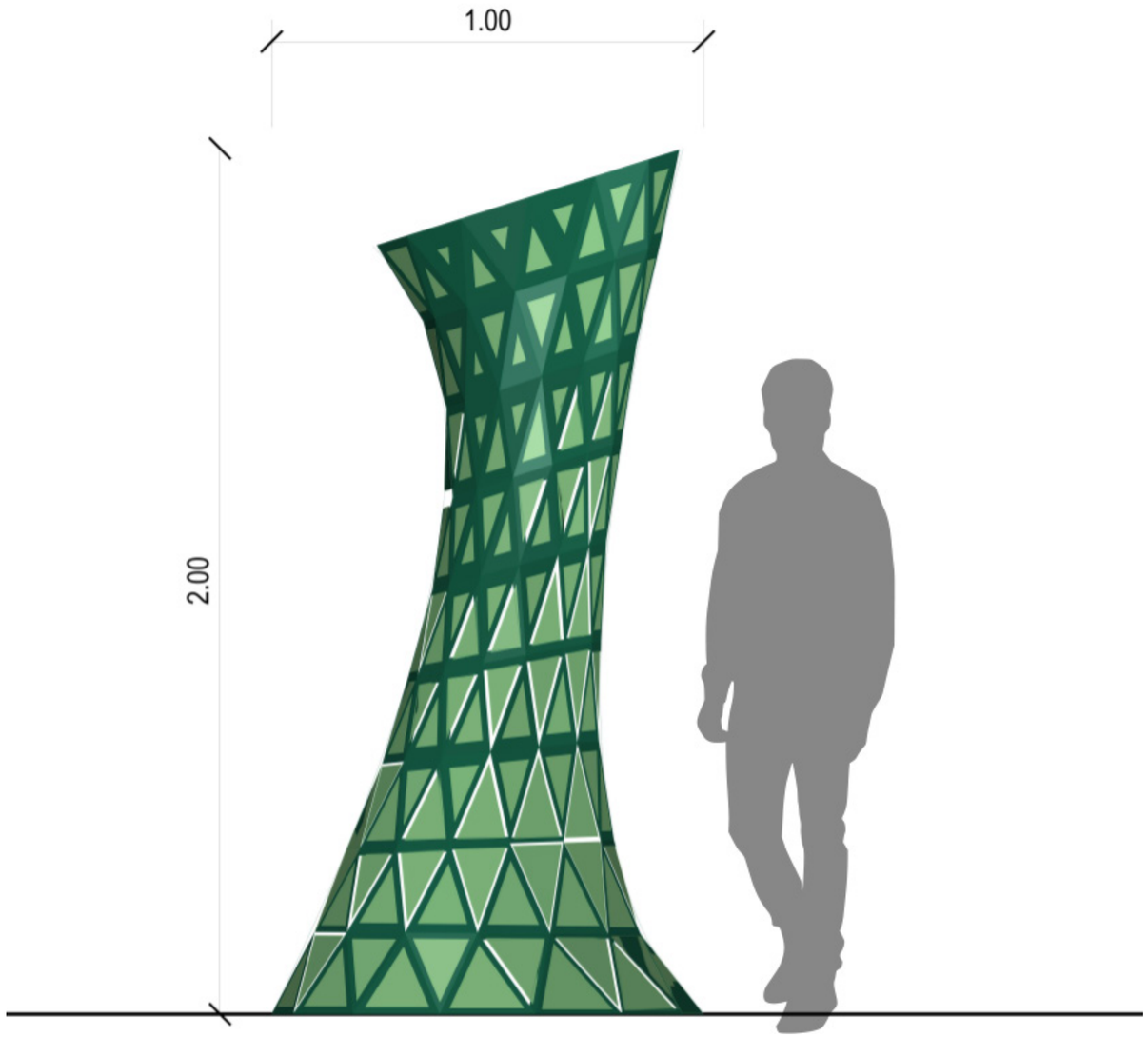


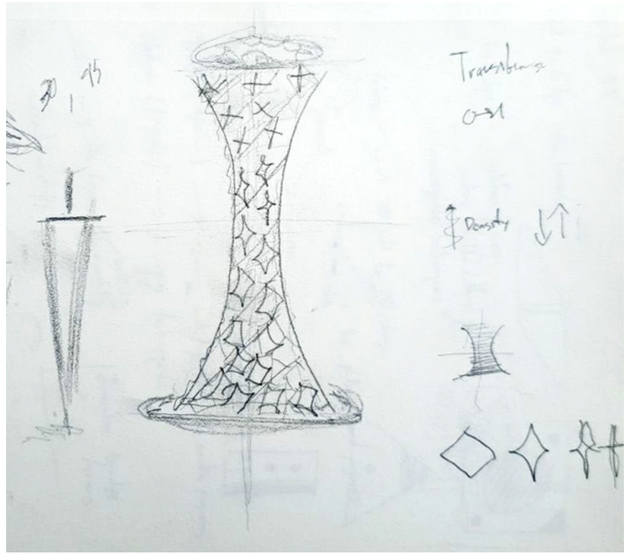
Prototype

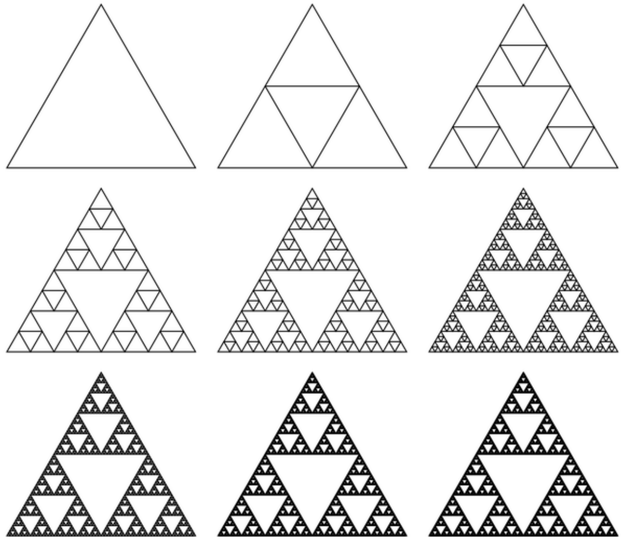







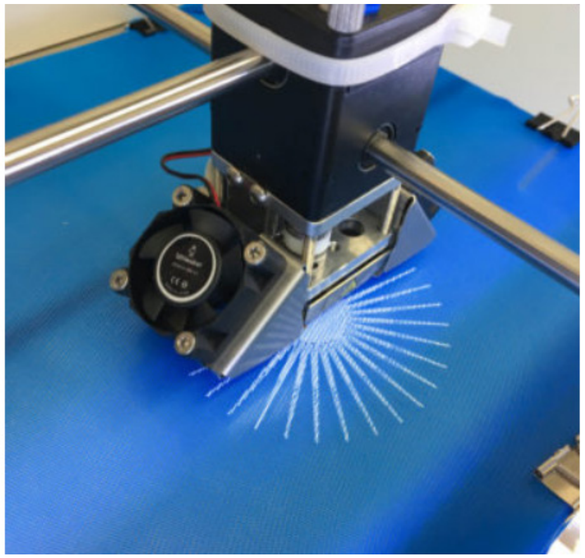


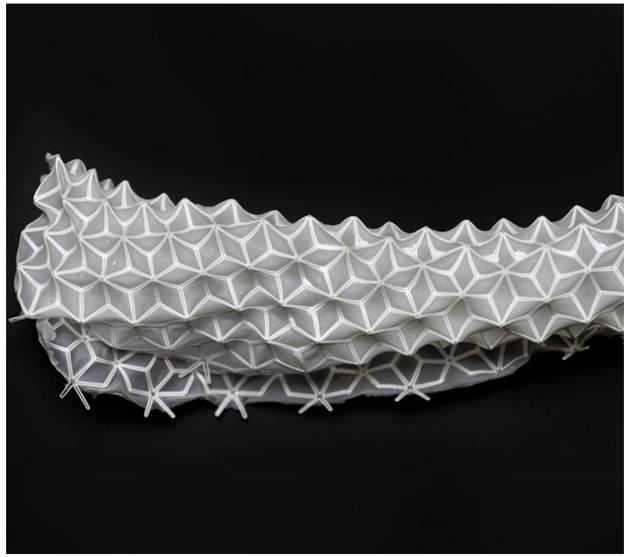




The components can be arranged to create any 3-dimensional surface. They will have different states such as: both halves open, outer half closed, inner half closed, and they will also vary in size. Because we want to maintain the triangular tessellation arrangement, the size will be ½ and ¼ of the original size. This will also create fractal-like density regions, like the Sierpiński triangle. Additionally, there could be regions where there a not components whatsoever, creating empty spaces that will contrast with the high-density regions.

The components are both structural and decorative, the final shape of the piece will grow upwards, alike the shape of a tree trunk or a catenoid.





We chose to use mixed materials to bring more interest to the components. We chose metal, plastic and/or cellulose composite. One option could also be wood but this needs more closer look before final decicion.

Metal: thin metal or metal sheets are bendable and easy to make in the needed form. As the bottom layer is static metal would be good supportive material giving at the same time the components bit shine and curvy shape. When using metal the components can be also ordered from metal company and this will save us some time.

Plastic: 3D printed or as thin ribbon like plastic material would give the top layer some texture and color. It also would give the components possibility to move and even make some sound. If we have some time we would like to test 3D printing on a fabric and see how it turns out. Plastic is also weather proofed.

Cellulose composite (bio material): The top layer could also be made of different cellulose composite mix for example wooden transparency, patterns cellulose or foamed methyl cellulose. With different chemical combinations the material can be made flexible and weather proofed. This material would be time-consuming as the accurate chemical receipt has to be made first.

Conclusions

We would have like to experiment with more materials. Most of the prototypes were made with paper or different types of cardboard. Another issue was the time management. Some members had other commitments thus decision making was affected a bit, however we managed to have several successful sessions for prototyping and brainstorming.

We believe that the main challenge ahead is the manufacturing of the components, which will greatly depend on the materials chosen and time management. Given that the curves emerge from the material properties, we must choose a material that will be structurally sound and can generate aesthetically pleasing shapes. We believe that once we have the first component with the chosen material the assembly will be straightforward given that all components are the same (beside the size) and modelling the overall shape of the whole piece will not take that much time and can be done algorithmically.

Contact Person:

Faezeh Sadeghi
faezeh.sadeghi@aalto.fi
+358466812739

Thank you.