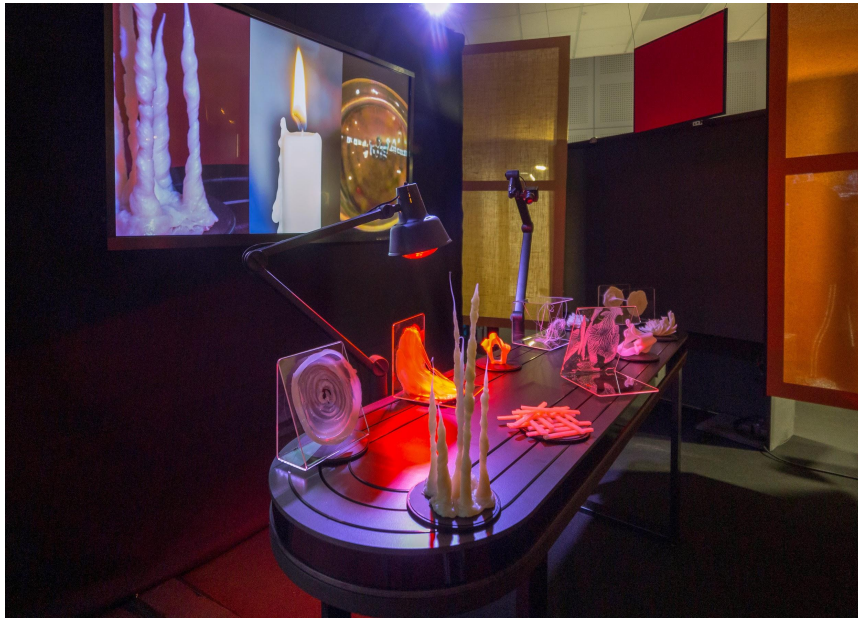


STARTS Residency Public Report

ALFRED (previously SPELAION)

Félix Côte for Collectif TOAST (Benjamin Muzart and Félix Côte)

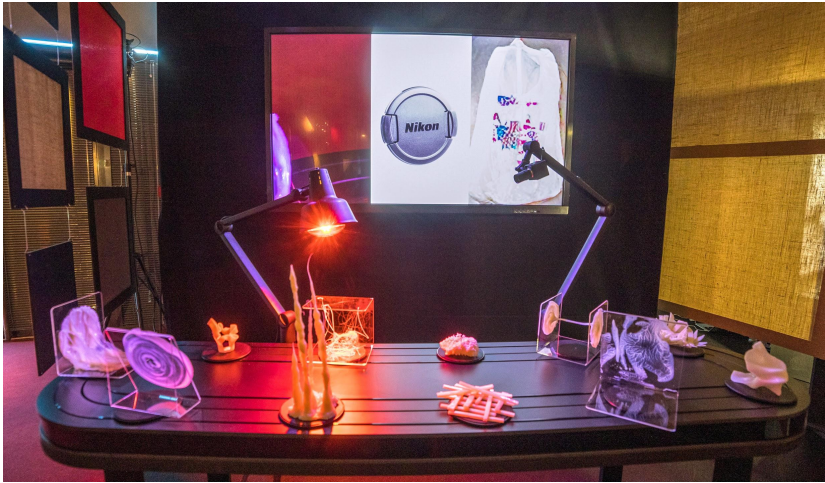


Abstract

ALFRED is an installation that explores the role of innovation today. It uses a polymer thermoplastic developed by a group of scientists in CEA Grenoble. The material in question offers a more durable alternative to plastic that, ideally, would never have to be thrown away. Collectif TOAST studied this new matter by exploring all its different modes of deformation and how to interact with it. The collective's work was based on using scientific protocols to create sculptures, textures and shapes from the material. This back and forth between aesthetic and scientific research resulted in the will to deeply question the matter's role within our innovation driven societies. ALFRED offers the public to see some of the sculptures made by the collective alongside a camera linked to an AI. The algorithm looks at the sculptures and makes associations with objects it recognizes. The results of such associations are displayed on a screen for the public to see and compare with its own imagination.

A special attention was given during the co-creation process to finding the right framework for collaboration and respecting the creative process of each parties. The collective's main takeaway from this experience was a deeper understanding and appreciation for the intricacies of the scientists' work.

***Index Terms*—Material, Polymer, AI, Generative, Sculpture, Video**



I. INTRODUCTION

The ALFRED residency involved Collectif TOAST and the LITEN lab in CEA, Grenoble, France. It took place in l'Atelier Arts Science in Grenoble. It spanned from September 2018 to February 2020 and ended with EXPERIMENTA, the art and science biennale of Grenoble where ALFRED was exhibited for the first time.

II. ARTWORK

The artwork, named ALFRED, is created by Collectif TOAST. We are a French collective formed by 2 artists (Benjamin Muzart and Félix Cote) from Grenoble, France. Our work focuses on impacts, in particular those brought by mankind's seemingly insatiable thirst for innovation. We use technologies in our work in order to draw attention to their consequences on society.

For ALFRED, we worked with scientists from CEA, Grenoble who develop a new material. This material is a polymer thermoplastic that reacts to heat. Its characteristics change depending on its temperature. At room temperature and below, the material behaves like a regular plastic: it is rigid, smooth and has a cream color. At around 50°C it becomes softer and malleable. It can then be shaped by hands or deformed by any other mechanical input. At higher temperatures, it tends to behave more and more like a liquid and has a honey feel to it. The innovative part of the material is that - as long as we do not exceed 180°C - it does not deteriorate. That means we can heat up and cool down the material theoretically an infinite number of times and there will still be the same quantity of matter left. This offers engaging possibilities for sculpting.

Among the residency's goals was for artists to take a fresh look at this technology and come up with interesting uses for it. Before the residency began, we proposed an interactive experience with this material. We wanted to have the matter react to human movement and create a choreography between human and matter. It was important for us not to study this technology in a vacuum but to place it within a social context where individuals and bodies interact. The artwork we wanted to create was an interactive ceiling. It was a 4 by 4 meters surface made entirely from the material under which the public could freely move and walk. A set of sensors combined with heat transmitters strategically placed on top of the surface would be activated depending on the people's movement underneath. Our goal here was for the matter to become softer so it would flow towards the ground and create stalactite-like structures. The whole installation would then become a large interactive cave.

This objective was set aside a few months within the residency for the following reasons:

1. After a few sessions of work trying to understand the different behaviors of the technology, we realized it was not possible to have such a large surface behave the way we wanted to. We would need to make the installation a lot smaller than we planned to and it felt like it was against our creative intentions.
2. Even if the material did behave the right way for our project, it would have been an extremely complex goal to carry out. The technical intricacies were not out of our scope of skills but they would have switched the focus of this project almost entirely towards technics. That leads us to the third and most important reason why we changed focus.
3. We wanted to be able to fully express our creative abilities with this material and felt that by following a predetermined goal we were missing out on many possibilities.

From this moment onward, instead of focusing on a specific application for this technology we focused on the technology itself. We set our minds and efforts towards finding many ways to interact with and deform it. This part of our work will be more detailed in the *Methodology* section. We studied the matter by making sculptures and felt that those were interesting enough to be displayed to a public. What was interesting about them was how different they could be in terms of textures and shapes even though they would all be made from the same material. They had a very organic feel while displaying abstract qualities. This led us to give them names from what we felt they could represent. For example, one sculpture was made of a lot of small strings stuck together. To a human eye it looked like the small tentacles that some jellyfish have. Therefore, this sculpture was called The Jellyfish. This process of comparing our abstract sculptures to our imagination was very important to us.

At this point during the residency (approximately halfway), we had a pretty good understanding of what this material could do. This was especially true in the “material” sense: we had a solid appreciation of its states at different temperatures and of its stretching, melting and sticking capabilities. In the meantime, we developed a better understanding of what technology this material was. Many innovations today are pushed to market in order to solve a specific problem. This one is no exception and proposes to solve the plastic crisis. The way we produce, use and recycle plastic today is far from ideal and a lot of it ends up polluting lands, rivers and oceans. The material aims to be an alternative to plastic that does not need to be thrown away. This premise, while engaging and possibly ground breaking, made us uneasy. Even though it is true that the life cycle of plastic today leaves a lot to be desired, it was difficult for us to use and promote an innovation that was still based on the exploitation of fossil fuel. In essence we had trouble understanding how we could solve a plastic crisis by developing another plastic. If we take a step back, it feels like our societies are trying to solve an innovation crisis by building more innovation. We think this process is endless and absurd, much alike what is portrayed in the myth of Sisyphus. This leads us to the description of the artwork we produced.

ALFRED aims to display these two characteristics of innovation: endlessness and absurdity. A set of sculptures made from the material are put on top of a conveyor belt. A camera is aimed at the sculptures and, due to the slow and steady movement of the conveyor, sees one sculpture at a time. The video data is sent to an AI algorithm which goal is to make associations. It finds the closest looking image in a dataset of 1000 images. The resulting associations are displayed on a screen behind the conveyor.

The AI software is constantly trying to assign meaning to what it sees, much alike us when we were working with the material. The resulting installation, with its never-ending cyclic motion and strange associations, aims to make the public question the very state of innovation today.

III. METHODOLOGY

This part will describe how we worked to create the sculptures.

The material reacts and changes when it is in contact to heat. Therefore, we spent a long time trying to figure out ways to apply heat to it. This outlines the most interesting part about sculpting this material which ended up being more focused on tools than shapes. We came up with different methods and protocols that we called “recipes”. They are simple guidelines that describe the steps needed in order to create a specific shape from the material. Here is an example:



The Shell

Necessary elements:

- 30g of material
- 1 microwave
- 2 cooking mats
- 50 cm of aluminium wire

To make *The Shell*, follow these steps:

1. Heat the volume of material for 30 seconds in a microwave at 600W.
2. Put it between the 2 cooking mats.
3. Press it between 2 flat surfaces in order to make a flat disk (~Ø 20 cm and 5 mm thick)
4. Heat the disk for 30 seconds in a microwave at 600W.
5. With the aluminium wire, create a structure on a flat surface. Bend the wire in order to have it turn and loop.
6. When the disk is hot, take it quickly out of the microwave and slowly drop it on the structure. It will slowly flow towards the table and wrap around the wire.
7. Let it cool down.
8. When cool, gently take the material out of the structure.

The resulting shape will look like a shell. It is incredible how it looks like movement while frozen in place.

Our methodology during the residency was to come up with approximately 20 recipes like this one. They are all here to study the different interactions one can have with the material. Some involves a microwave, or an infrared lamp, or a blowtorch...

Each recipe creates one specific texture or shape but there is a lot of randomness to it. Therefore 2 shells

will not look exactly the same.

IV. CO-CREATION PROCESS

The residency took place with a lot of back and forth with the science team. We talked a lot with the scientists in order to grasp their vision. We explained our processes and what we wanted our role to be. We like to see artists not as storytellers, but as regular citizens who raise questions about the current times. That was made clear quite early and, albeit specific moments where communication and languages needed to be adjusted, we were able to express ourselves freely.

After the halfway point of the residency, we were creating something that was actively criticizing and challenging the science team's work. We wanted our installation to question innovation in general by the mean of this specific technology. This situation had the potential to be greatly uncomfortable for everyone. However, through openness to each party's opinions and communication, we were able to adjust our footing and collaborate efficiently.

V. IMPACT

A. *Research Impact*

As said above, relationships between artists and scientists do not need to always be set in agreement. We believe artists need to be a hindrance to science. This does not mean the relationship between those two entities need to be difficult. We believe the best thing artists can offer to scientists are difficult questions and a strict eye on their work. This ideally leads innovation to reflect on its goals and, possibly, change its course when it produces something that is not needed.

One of the impacts on the Tech Project was to "force" its members to question themselves while changing the paradigm to find a first societal and ecological optimum in this project. The work, with its real and imaginary sides pushed the Tech Project to dare to confront the public (Expérimenta 2020), to understand the true dimension of the Project. The impact on its work can be summarized as follows: there will be a before and an after Alfred!

B. *Artistic Impact*

Working with scientists and CEA, Grenoble was full of insights for us. We had the chance to see where and how innovation is made today. We were inspired by the scientific methods and implemented it in our way to interact with the material.

VI. ART-SCIENCE INTER-RELATIONSHIPS

We believe artists and scientists are the two sides of the same coin. Their work stems from the same curiosity for knowledge and truths about the world around them. However, they use drastically different institutions to achieve what is for us essentially the same goal. It seems natural to make those two entities collaborate and reflect on each other's processes.

VII. FUTURE DIRECTION AND ACTIONS

The work on ALFRED is essentially finished. The format of this installation lets us experiment with the

material more if we want to. We could easily come up with other recipes and sculptures to show for other exhibitions. This keeps this installation challenging.

We wish to keep exhibiting this installation, whether in museum, in a “contemporary art” setting or during events dedicated to innovation or science in general.

VIII. CONCLUSION

A. Concluding Remarks

This residency was a great way to confront ourselves to the science world and create something that has meaning for us. The collaboration let each party reflect on their work and outlined the importance of discussion and divergent opinions.

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