

Adding value to research and technology through integration of artists in projects and synergy creation between creative industries, entrepreneurs, researchers and arts

STARTS Residency Public Report

Froth of the Daydream

Julie Desmet Weaver

Black Euphoria studio created a 360-cylinder structure with circular screen and spatialized sound. Amateur of Boris Vian, and already occupied with the staging of a play by the author, Julie Desmet Weaver has made this structure her playground. After a long period of reflection and necessary framing, the team developed an immersive and interactive collective experience based on Boris Vian's famous novel.

For Froth of the Daydream, working with the artist Julie Desmet Weaver revealed Black Euphoria's developers' sense of craziness which allowed them to boost their technology. It led to the development of an innovative volumetric capture technology while being a thrilling human experience.

I. INTRODUCTION

Please find joined to this file all the artwork 's description of FROTH OF THE DAYDREAM.

And here links video to see images of our work and our research:

1 - Our making off: https://www.youtube.com/watch?v=3SXA9EWj_h0

2 - Our artistic and technologic work inside the Cube of Black Euphoria:
<https://vimeo.com/409693545/833eaa2df0>

II. ARTWORK

CONCEPT / FROTH OF THE DAYDREAM is a collective virtual reality experience inspired by the jazz-novel *L'Écume des jours* and imagined for Boris Vian's birth centenary in 2020. The spectator is invited to enter the immersive space of Le Cube - a traveling VR device - to live an interactive and participative experience of about 20 minutes.

This experience presents itself as a funny, poetic and literary "installation". The public is invited to enter the Cube - an interactive and sensory device. The spectator, caught up in the immersive universe projected all around him, is immersed in the heart of the narration - the virtual universes on the cylindrical screen are animated so that the spectator has the feeling that the space changes in real time. To move from one sequence to another, spectators are invited to interact in an intuitive way with Boris Vian's flagship inventions (such as Pianocktail, biglemoi, and anti-water lily flowers ...) to make advance the story and trigger funny or dramatic situations. Thus, they interfere with the narrative, visual and sound universe projected around them. It is by

accomplishing these key actions that spectators explore the elaborate interactive schemas and absorb physically and emotionally the ingenious and wacky situations described by Boris Vian.

III. METHODOLOGY

L'écume des jours is one of the French literature 's treasures (one of the most translated novels in the world - 42 languages). When I was asked to myself to imagine this interactive project, I immediately thought of Boris Vian, because his surreal universe, allowed to place the spectators in a context where space and time are malleable, changing and modular.

My main challenges in adapting this novel for a virtual reality device were to be able to offer spectators to (re) experience the sensations, emotions, sounds, roughness and colors of this text. I wanted to be able to immerse the audience in a virtual and sound reverie, to invite them to enter a modern, immersive and interactive universe, so that they can live a physical and sensory experience of the literary work of Boris Vian. Also, to create this magic, it was necessary to be able to rely on ingenious technological devices.

The Black Euphoria Cube system used for this experiment is based on two main technologies:

- On the one hand, there is the virtual reality representation of the Cube which allows to collectively share a VR360 scene.
- On the other hand, there is the InLum.in technology of multi-camera 3D capture in real time which allows to have an immediate representation of the occupation of space, of people and of their gestures, via several hubs, each grouping together several volumetric cameras (RGB-DI) streamed live to a central computer where the virtual world is simulated.

InLumin allows, for example, to immediately know the volume of a room, to move its camera in time and space freely, to deduce the kinetics of objects and to insert them into a physical simulation engine particle. This technical installation also provides a virtual trackpad (circular like Le Cube) allowing multitouch interaction for several participants.

This device therefore offers the public the possibility to interact intuitively, because the viewer does not have to use joysticks: it is really his body, his movements and his intentions that modify the visual and sound universe. This invisible technology makes the experience all the more magical.

The artistic and technological ambitions were clearly established upstream. We had written the non-exhaustive list of our artistic and technological needs. It was question for each part (artistic and technological) to develop, produce, or procure us, the necessary artistic or technical elements (such as an immersive storyboard, media recordings on a green background, creation of visual and sound special effects, writing codes-shaders, pre-writes of interaction codes...) in order to be able to work together on intensive research times within the Cube system. It was also about finding an intelligent balance between our possibilities, our constraints and our ambitions.

IV. CO-CREATION PROCESS

Our first meetings took place, in Marseille, at Black Euphoria, we worked a lot on the development of specifications and a production file, in order to very clearly specify our objectives, our expectations and our

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mutual ambitions: A long drafting work which has been carried out upstream and which was considerably useful for building, in agreement, a common project.

// This file - adjusted in real time, according to our progress - also allowed us to move forward on our production and dissemination strategies and to be identified by possible partners and broadcasters.

Our missions and our objectives were, very early, clearly defined, namely on the one hand, everything concerning the challenges of the technical device of the Cube and volumetric capture, and on the other hand all that I had to prepare as narrative, visual and audio contents.

It was about - for my artistic part - to give to the technical team: an interactive scenario, “storyboard” images of all the immersive sets, to have a first visual and sound contents for our tests and to specify the narrative stake of the interactions in order to be able to enter the development phase with the R&D team. A period of consultation was devoted to renderings, and in particular to the resolution of audiovisual contents so that they could be easily and judiciously integrated into the system.

It is, indeed, the different phases of development - during which we worked together inside the cylindrical space of the Cube of Black Euphoria, which were particularly enriching for me, because the space-time reality and the physical sensations lived in the Cube are particularly different than on a stage or on a cinema screen = also the artistic project that I had first sketched, appeared to me, inside the Cube space in a rather spectacular way, opening up, to me, new fields of ' investigation.

The residency periods that we were able to do, together, inside the Cube made it possible to define the precise content of the immersive, interactive and collective XR experience. It was a question of applying the first immersive decors in space, of refining the visual and sound universes and of organizing the unfolding of narrative sequences in this very specific 360 ° space.

My close collaboration with the technical directors Vincent Borrel and Nicolas Gambini was also the opportunity to define precisely the imagined interactions – considering my artistic issues. The two technical directors have programmed, organized and integrated all my narrative architecture, focusing their thinking on the interactive technical possibilities, that they were conceiving. *In addition, they were able to develop and ergonomically validate the real-time volumetric interaction methods they were developing.*

For example:

- A cylindrical virtual touch zone has been set up (isomorphic to the projection screen); thus, when the spectators approach the virtual cylinder at the points of proximity, a suitable touch is triggered for the **pianocktail** and the overplay of the flowers on the swamp sequence. These interactions developed and functionally tested have given good results and fluid reactivity. The interaction thus makes it possible to intuitively perceive the act of playing jazz, in one minute, on a completely new instrument for beginners!
- In the **Biglemoi interaction**, the idea was to make the participants dance. For this, we have built a typical sequence interpreted by the character of Nicolas who is dancing (The system provides for several learning zones.) The spectators see their silhouette in “point clouds” projected on the screens of

the cylinder. The system is calibrated according to the evolution of their volumetric representation, allowing spectators to validate their movements at a given time (via lateral or vertical movements)

- In the **swamp interaction**, the spectators' movements cover with flowers, the dark space of the room. Here, there is an effect realized with a painting program with the hands whose overplay disappears behind - first optimally, then gradually (initiating an exponential fall) the persistence and opacity of this bright and colorful overplay becomes more and more fleeting. A form of secondary musical interaction has been added to the musical universe via a crystal-clear sound representing hope and lightness.

This development phase will have identified the needs for our filming on a green background. Indispensable shooting to integrate the actors' play in the middle of the virtual decors, in the cylindrical screen. We were thus able to time each "narrative module" (sequence) so as to respect the total duration of the experience, and to work on the precise division of the scenes to be shot.

We did some tests so as to anticipate, when shooting, the mechanics and optimal positions of the camera. So that the movements and the looks of the actors are realistic when the images are projected at 360 ° .

Finally, these residences gave us the opportunity to apply all the images of the storyboard of our immersive decors in real conditions. So, we started an important work of animation. This allowed us, among other things, to confirm the importance of the filmed images during our shooting, so as to be as close as possible to an organic and almost sensual aesthetic.

This development phase clarified the effects necessary to visually support the understanding of the actions to be performed (sound effects, flashes, music, etc.).

Based on all these tests, we now have a very precise idea of "where we are going". The filming on a green background with the actors brought play, life, humor and emotion. These interpreted scenes will truly give body and voice to the experience: being able to film sensations of heat, wind, humidity ... is essential. These filmed sequences will punctuate the action and grab the viewer into the story. I also wanted to film plants, moss, different states of the water ... all of this gives emotionally enriched animations.

After the shooting, it should be noted that an important work of animation was started. It was a question of integrating, associating, skillfully mixing these real images, animations, and our special effects.

The music is still being created. We continue to work with composers and mixers on the development of an immersive sound universe that will adroitly punctually interact with the audience.

V.IMPACT

A. Research Impact

Tech project words:

"The XR experience Froth of the daydream is the result of a very close collaboration between Julie Desmet Weaver, who is the origin of the project, the production company Black Euphoria and the technical directors, Vincent Borrel and Nicolas Gambini. For almost two years, we've been designing and imagining, hand in hand, this original and ambitious experience which is based on technological innovations (3 real time scanner / volumetric capture...) that we have been able to adapt and perfectly accord to narrative advances and the needs of this artistic residency. As director and "designer" of the experience, Julie imagined an interactivity screen/public for certain precise sequences (*Pianocktail*, *Biglemoi...*), which seemed to us representative of the

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poetic universe of Boris Vian. The technical directors therefore had to manage to design and set up a technical device that could allow the public, without tools and accessories, to change what we see on screen and we hear only by their movements in the cylindrical space (360) of the Cube. This represents a very important innovation and probably a technological preview for this type of narrative experience of new media.

The creation residencies in Marseille and Avignon were therefore the ideal opportunity to work collectively on the subject, to carry out tests, to refine the technology, to prototype. It seemed essential to us to be able to gather the director, the artistic director, the animators and the technical directors, to be able to exchange and pool all of everyone's knowledge in their fields. Julie had for example to rework certain written passages and dialogues after the first test screenings in the Cube, the Art Director, Alain Lagarde, had to change certain settings 2D, the technical directors think about technical tools allowing it to obtain something more fluid, more understandable and intuitive for the audience.

As producers of digital experiences, we are interested in using new technologies to invent new ways of telling stories. And we wish to offer original, unexpected experiences. In this context, it's always for us the role of technicians to adapt to the wishes of the artist and to propose an adequate solution, without altering the creative imagination of project leaders.

What is really interesting for me is to see how much this project has accelerated technological innovations and conversely how technology has enabled the realization of what Julie imagined in her mind and her wildest dreams. The residency is all the more successful in that it will have helped us to consolidate the idea that we defend (with CNC for example) that we, producers of digital experiences, must associate the technical with the editorial and artistic from the start/beginning of the project."

B. Artistic Impact

Since 2017, my artistic approach has been to engage in the exploration of a writing involving digital language in order to offer new experiences to the viewer and to initiate encounters around visual, sound and interactive stories. My artistic intention consists in imagining transversal and multidisciplinary artistic forms which integrate, from their conception, the specificities of the support, the tools and the formats used.

When I imagined a screenplay for this collective virtual reality experience, my intentions really consisted in using the immersive space made available to me as a central element of the narrative. I think that my experience as a stage director helped me to design a writing-spatialized, in this malleable decor (visual and sound) which unfolds at 360 ° .

I worked, in particular, on the need to create judicious bridges between story and the technical supports proposed by the structure of virtual reality designed by Black Euphoria.

Indeed, I was immediately seduced by Le Cube by Black Euphoria, both for the perspectives of collective immersion that this structure offers at 360 ° , and for its intuitive interaction device (without joysticks), but also for its traveling dimension. The Cube is likely to appear in public space as a bubble of poetry and mystery. (It is planned that the installation of the exterior structure will be scenographed so that the experience begins as soon as it is discovered in the places of dissemination.)

Thus, this experience combining literature, cinema and innovation can meet new audiences. It is important to note, that this adaptation imagined for Le Cube was for me the object of a radically different reflection from that of a live performance. This is an evolution of my writing work which was consisting in directly integrating this singular technical device and its principles of interaction in my choices of narration and in my storyboard. The cube space becomes a full-fledged scene in which the audience is the driving force behind the story.

We were therefore able, in close collaboration with the Cube team, to build this experience by developing a journey through three major interactive sequences - proposing to the spectators of funny, playful or sometimes more dramatic situations. The artistic and technological intentions was to dive the spectators physically inside this fabulous story, and to let them a physically and sensory memories.

The froth of the daydream is a participative experience: where the spectators are invited to be involved physically to be able to advance in the story, in particular through their interaction with the flagship inventions of Boris Vian.

VI. ART-SCIENCE INTER-RELATIONSHIPS

I think that the success of our collaboration comes from the fact of having specified, upstream, our respective expectations. Indeed, a fairly long work of writing started, from the beginning of our residency, so that the objectives of our residency, and also the final form of the project that we wanted to create, were clearly identified.

In addition, the first stages of discovery and work inside the Cube were essential for me to understand the possibilities, the constraints of the device, and the formidable perspectives of creation which Le Cube offered by its immersive dimension, and by the technical possibilities of intuitive interaction (without joystick) which were made possible by volumetric capture.

Indeed, I think I have learned a lot from my partners. I was really lucky to have been driven in the accomplishment of my artistic project, both in the synthetic and intelligent writing of my ideas (on the production files) but also during our work residencies inside the cube, where I was truly initiated to new forms of creations involving innovative technical devices.

I learned to work and to rethink my artistic project by integrating, very quickly, the technical constraints of the device (moreover, often interesting in the advancement of ideas). I learned to design our research horizontally, that is to say by considering that each member of the team contributes to the issue, and that we are moving together in the same direction. I recognize that the fact of having taken a considerable time, upstream, to define our expectations and our objectives, allowed us to be effective during periods of production. Indeed, during these intense periods during which we were working inside the Cube, we had already listed what we wanted to be able to test.

VII. FUTURE DIRECTION AND ACTIONS

The final step of this work will take place inside the Cube in a final creation residency in August 2020 during which we will adjust all the pieces of the puzzle. It will be a question of achieving a stable computer program

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which will be able to launch the interactions and the sequences, in PLUG AND PLAY without any external intervention, so as to offer to the general public an original immersion in a dreamlike universe, allowing them to experience interactivity, absolutely inseparable from the progress of the narrative thread.

The question of the diffusion of the project remains essential since it contributes to its emergence. For my part, outside the Festivals, it seems to me wise to imagine being able to put Le Cube in all kinds of places accessible to the public - at least ten days - and to prepare the event of its installation by meeting the different audiences thanks to a calendar of actions. My intention is therefore really to support the flow of audiences through mediations, meetings and workshops to tell and share our experience.

VIII. CONCLUSION

I find it extremely touching that artists and developers can work together - skilfully mixing lines of words and lines of code - to create a new immersive and interactive project. Indeed, all the artistic and technical teams came together and worked together in an “art / science” alchemy so as to be able to invite spectators to live a sensitive, funny and poetic experience, at the heart of the famous jazz novel by Boris Vian “Froth of the Daydream”.

ACKNOWLEDGMENT