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"The Alchemy of Dreams"

- an animation made in 3D and 2D graphic programs with applying scanning methods, equipped with the possibility of watching some of the scenes by means of Oculus glasses"

Doctoral Dissertation
prepared under the direction of
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in Katowice

Katowice 2016

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I. Introduction

*To live and suffer – it's unworthy of a man.
We cannot be stuck in pain.
We need to plunge in it, to live in it fully,
and then to forge stairs out of it,
and they will bring us to the temple of joy.*

Zenta Maurina Randive

The subject of my dissertation is a few minute animation titled "*The Alchemy of Dreams*" - an animation made in 3D and 2D graphic programs with applying scanning methods, equipped with the possibility of watching some of the scenes by means of Oculus glasses"

The term *alchemy* has many meanings – beginning with the search for the philosopher's stone which became the basis of chemistry, to broader understanding and psychological interpretation. According to the Swiss psychologist and psychiatrist Carl Gustav Jung, alchemy is all the processes taking place in human psyche, with or without the participation of consciousness.

In my study the alchemy occurs both in the way it was understood by Jung as well as in the creative process based on my applying various artistic tools aiming at obtaining a suitable narrative animation and evoking the proper reaction of the viewer.

Although the main tool which I used was my computer, but in order to build the scenes in the film I also used some natural materials such as clay, paper or oil paints applied on canvas. After being scanned, the materials underwent appropriate processing in graphic programs and, as a result, I obtained their digital version. It allowed me to combine them unconventionally with 3D models, which are entirely made in computer graphic programs, and, what is more, the process of combining the materials allowed me to obtain free, surprising manipulation of the change of their purpose. In this way the scan of the surface of oil paints applied on canvas became full, three-dimensional scenery in animation. The scan of the crumpled piece of paper was used to build the next scene, in which it was combined with the scans of ruined buildings.

I changed the scale of objects set on the scene in two directions in the way that the big ones became smaller and the small ones - bigger. I had no limitations while creating the images of the scenes – the real objects were combined with elements made entirely by using computer graphic programs, so that I could get a surprising narration of my story.

Paper has a great creative potential. It might be a sculpture, package, letter or a book. It is often used to write down our thoughts and ideas and this role of paper has a special meaning for me. Therefore, I wanted to use it in my work as a metaphor of writing down dreams of the animation main character. It is recording of the dreams by means of images which show the wandering of a man through a land to which he escapes when intrusive memories creep into his thoughts.

One can express different mental states of a man using the structure of paper. Crumpled and stifled piece of paper reflects the feelings of a man, who after traumatic experiences, lost his meaning of life and saw no reason to continue it. The sterility of the scenes which was achieved due to the texture of paper, allowed to present the futility of the human being's images of life, and that leads to depression. We find out from the interviews with people suffering from depression that their perceiving of the world changed a lot because of the illness, their lives lost colors. Everything became grey. Their inner world, in which they shelter, is also colorless. In this state of mind they are not able to create colorful, beautiful visions of other world in which they would rather to live (7,9,10). That is why my character's world of dreams is monochromatic and ascetic. It may be bright because it is where he looks for consolation, but it still is colorless. The only coloristic element that appears in this part of the animation is the photorealistic tree our hero sits under. He remembers this tree very well as he used to spend nice moments of relax under it and so he misses the tree. The rest of elements of the image that is being created in the man's head are plain and similar to one another – paper trees. There are also other objects such as ruins of buildings which appear in the vision, and unfortunately, these objects start to resemble him the troubled past.

Another form of communication that I used in the film is the texture of oil paint. I chose the oil paint because of its consistency and creative possibilities associated with it. Paint fascinated me when I watched impressionists' paintings made in impasto technique. Brush strokes which created shapes at different depths of thick paint, not only created the image, but also stored emotions and thoughts of the painter. In the

texture of such paint, its creator's gestures and an energy are included. Traces left by the brush strokes, their length, shape, depth, show the creative process, "tell" about it. This is why a thick paint became an inspiration for me to use it in my work as a metaphor expressing emotions of the animation main character.

I used dark colors of paint, which are to symbolize the darkness of the visions that formed in the man's head. I showed the moment when the character of the animation decides to face his difficult memories as his journey through a bumpy, surrounding him, thick layer of paint. Everything what is traumatic in his memories was covered with the scan of the paint texture which symbolizes heavy, emotional load in order to convey the feeling of burden and depression which accompanied the man.

Light has very important role in painting. I used specific light in various scenes and it helped me to show the right mood and feelings of the character. The darkness filling the room and the overexposed window in the first scene of animation are not accidental.. In this way I wanted to emphasize character's separation from the outside world and his depression. The main symptoms of depression are isolating from other people, the willingness to spend time alone and lack of interest in the outside world (7,9,10). The hero of the animation not only sits in solitude in the dark room but he turned his body side towards the window. In this way I would like to emphasize his lack of interest in life going on around him. Whereas, the piles of books standing in his room suggest that the man was looking for the way to escape from the real world to the world described in these books. The man's mental state was shown also by changing colors of the following scenes. From the bright colors visible in the first scenes of the man's wandering, to the darker shades of the colors in the next ones. The world of nightmare appearing in his head, manifests itself not only by the darker colors, but also by the structure of paints, which surrounds and thickens around him more and more tightly, revealing a sense of depression and entrapment that he experiences.

With the rise of emotions, when the moment of confrontation with the traumatic memory was approaching and fear was growing, the colors of the scenes became visibly darker with black color in the background. Sick psyche of the man makes both the world around him as well as the world created in his imagination distorted.

Therefore, in my work, I attempted to show the images that formed in the man's head by means of using elements that enable to create unrealistic worlds.

I obtained this effect by applying the scans of crumpled sheets of paper, the structure of the oil paints and objects modeled in clay. Unspecified, carefree world, where he was once happy, is shown as scenes that are bright, light and made of paper. The feeling of loneliness, depression and anxiety are presented by the scene in which the character walks through surreal areas. This effect was achieved by the change of scale of the scanned paint surface applied to canvas, which became the character's place of wandering. These efforts aimed at evoking certain emotions in the viewer, identical to those which the main character of the story was to experience. In my work I presented two worlds which penetrating each other: first – the real one, his room where he was spending all his life, the second one – unreal, his psychological world in which he was drowning. The first world was made with great care, mirroring the real world, both in the shapes of objects as well as in the texture and lightness. In the second world I used the scanned surfaces of paper, clay and oil paint strokes. The structure of paper, clay or brush strokes became the scene in which the main character of the animation simultaneously stayed in his dreams or visions and he battled his fears. These worlds were created on the principle of contrast, so that the viewer could distinguish the places to which I wanted to take him and at the same time he was able to feel unreality of the surrounding world and fear, that is the feelings that a depressed man frequently experiences.

In order to delve deeper into the narrated story, some of the scenes were prepared to watch them by means of 3D Oculus glasses. The depth of the viewer's experience can be enhanced by the possibility to enter into some images of animation by using 3D glasses. Thanks to them one will be able to be in a hero's place in some places of the world which he created in his imagination.

And so, the viewer is also able to go through the valley that the character followed.

II. The description of the plot of animation

In the storyline of the animation I mainly focused on psychological processes taking place in the brain of the man who lost his will to live because of the events that happened to him in the past.

He cannot come to terms with the facts that he still remembers and with his current condition - his disability. At the same time I wanted to show the strength of human psyche, the force which influences us in both destructive and healing ways. These are mental processes, our thoughts, that can cause illnesses and even death, or they may lead us out of our weaknesses and let us enjoy life.

The main character of the animation is not set in a specific place or time, as similar situations in life are universal.

Therefore, the movie tells the story of a man who took part in the dramatic war actions after which he became very injured, he lost the use of his legs. A young and up to now, active man, energetic and full of life strength, suddenly had to stop. Everything that he had been occupied with so far became the past. A completely different reality appeared to him – a dark one, sad, even gloomy, static, grey and it was surrounding him more and more tightly and was evoking stronger feeling of depression. His energy and strength were leaking out day by day and his psychological suffering was intensifying, his will to live was weakening.

The man could not come to terms with his disability, but it was not the only source of his mental suffering. He was spending whole days sitting in a wheelchair in his room full of books reading of which filled his loneliness. Every day he retraced the situations that happened. He did not come to terms with the tragic experiences, he did not accept his present state and all of these thoughts and feelings resulted in his isolation and total retreat from life. He was alone and deeply unhappy. He looked through the window at the world and people walking or running across the street, who were laughing and talking to each other. For the story character sitting in a wheelchair this world became strange and out of reach. When he closed his eyes or was reading books, he fell into a daydream. Visions from different reality appeared in his mind and in this reality he wanted to be happy. There were memories of images associated with good and happy moments which took place before the tragic events. He loved plunging in his world because only this intricately built and based on memories world allowed him to live. When he opened his eyes, the suffering came back again. Tragic images of

the crashed plane and dying colleagues appeared. He was seized with pain of tormenting sense of guilt that he had not saved his colleagues' lives, but he himself survived. These images and thoughts were sucking out his will to live. The nightmare lasted for years and he was still trying to escape from it consciously and unconsciously.

However, at some point, the man decided to face these traumatic memories plunging in them deeper and deeper. He "watched" and "listened" the painful pictures of the tragedy. Each time of insight he made a deeper analysis of what had happened. His brain consciously and unconsciously processed images from the last event. Finally, he heard the voice which he had not understood before. The voice of his seriously wounded friend who appeared in his nightmares and visions. The friend shouted something that he previously understood differently. To his great surprise his friend did not cry for help, but shouted to him to save himself. "*Save yourself, run away, you are not able to help us any more*". The suffering man in the story heard this voice so clearly for the first time, and then he suddenly understood that he was not the one to blame for his colleagues' deaths. Finally, he understood that he had not been able to do anything for them then.

This understanding freed the tormented soul of the man from the burden that had been with him for years. He finally felt that he was being born again to a new, happier life. In one moment the surrounding world started to change its colors. The feeling of joy, will to live and strength filled him entirely.

Constant processing of traumatic memories, escaping to the world of dreams and continuous analysis of what happened was therapeutic. Understanding that came at last after years of suffering freed him from the burden of guilt.

I based the description of character's experiences on research conducted by psychologists working in the field of depression psychology. While analyzing the behavior of people suffering from depression I created a psychological image of my hero.

Tormenting pricks of consciousness, the inability to change the very difficult situation in which one stuck, the loss of meaning in life, awareness of the lack of control in his life are often the reasons for depression, and consequently one's life becomes a mere vegetation. Death often seems to be the only solution for many people suffering from the depression, and they think about it more and more often. However, a human body striving to maintain homeostasis both physiological and psychological starts to switch on various immune defences. One of them is an isolating and aversion

to any contact, not only with strangers, but also with the loved ones. Firestone R. and Catlett J. also enumerate mechanisms of depression such as clinging to well-known schemes, getting addicted to other people or remaining in a fantasy world (2). Escape from reality to the world of dreams concerns both sick or deeply unhappy people, but also healthy ones. It seems to be a quite common phenomenon. Research conducted by psychologists show that in situations of mental burden which exceeds human capabilities to deal with, dreams or fantasies can hold a balance for human's mental activity. This may protect the ill people from mental illness or suicide.

Syristova E. believes that dreams may have a calming effect on a person. The dreams tend to be the very opposite to real life which is too heavy to bear. The dreams may be, as it is written by the author, a sort of "garden of all pleasures" (11).

Dreams were the area of research for both psychologists of emotions (Taylor, Bagby, Parker), as well as cognitive psychologists (Maruszewski, Łukaszewski, Obuchowski). As a result of research, the psychologists stated that they have one similar scenario in common. There are always some events and actors that appear in them, however the main actor is the man who is dreaming. In most cases the scenery of these dreams is quite specified (8).

B. Dymara defines the dreams as an "imaginative-mental activity, the object of which is satisfying desires, aspirations, plans concerning one's life, often very personal" (1). The dreams have a tremendous power and become the energy which is necessary for life. They allow to overcome hardships of life or they simply help to survive in the most difficult moments and come out of the depression. Almost miraculous effect of dreams was shown in the animation I have made.

III. Methods and tools used in animation

Modeling of objects, rendering and animation

I made all the models which appear in my work with the use of graphic programs Autodesk Maya and Pixologic Zbrush.

Pixologic Zbrush is a program designed for carving organic and mechanical objects. Because of the great capabilities of the program it is very often used in the film industry and for making computer games. The high efficiency of the program and its ability to obtain high-quality details is highly appreciated.

Modeling by means of this program is similar to sculpting in clay. Tools called brushes are used for this purpose and they are imitations of tools used by sculptors. Additionally, you can use brushes made exclusively for the program Zbrush. The great advantage of this program is also the possibility of symmetrical sculpting, which largely speeds up work on a model. Another helpful function is the alpha implementation - the patterns of the details that can be applied on an object and, if necessary, duplicate them and that greatly reduces the time of working on a model (3,4).

Autodesk Maya, similarly to Pixologic Zbrush, is also widely used in the film industry and while making computer games. It is a more universal program than Pixologic Zbrush because it is used not only for modeling 3D objects, but also for making scenes and rendering, and I used these functions in my work. Additionally, I also used another function of Autodesk Maya i.e. preparing objects for animation. The program has many other, very advanced options, such as the simulation of hair, fabrics, liquids and gases (3,5,6).

In my dissertation I also used Chaos Group V-Ray, which is an additional application to different 3D programs, including Autodesk Maya. Due to the fact that it is a rendering engine which among others uses advanced algorithms of global illumination, allowing to obtain a very realistic lighting, I used it for lighting the scenes in my work. The application of Chaos Group V-Ray tools also allowed me to plan the camera work and obtaining a desired scene atmosphere. Technical values of the program cause that it is used in film and advertisement productions as well as in architectural visualizations. All scenes of my animation were rendered in this engine.

Objects scanning

I used a method of photo scanning with the use of Agisoft PhotoScan software, which allows to combine imported images. As a result of this scanning three-dimensional models were created. I scanned the objects used in my work both outside and in the 3D scanning studio (Photo 1). The smaller objects applied in my work I subjected to this process in a shadow-free tent using a camera

In my work, I used the scans of buildings and ruins fragments from different areas of Poland. I also scanned the surfaces of oil paints applied onto the canvas, crumpled sheets of paper and model of a valley made entirely of modeling clay (Picture 8,18,21).



Photo 1. 3D scanner (my own source)

Objects Texturing

Adobe Photoshop is one of the most popular programs used for 2D graphics. Due to the large range of available tools this program is most commonly used for processing images and digital drawing. It is highly appreciated by 3D artists.

In my work I made the texture of the objects modeled in graphic computer programs with the use of Adobe Photoshop program. In case of scanned objects, I subjected the texture, which was obtained by scanning, to further processing in the program mentioned above.

Post-production

One of the most widely used programs for film and advertisement post-production is Adobe After Effects. In my work I used it to balance colors, improve the lighting of scenes and adding the tiny effects such as dust, smoke. It allowed me to obtain a suitable narrative atmosphere, to introduce a viewer in a sad, dark world of the hero and in his dreadful memories.

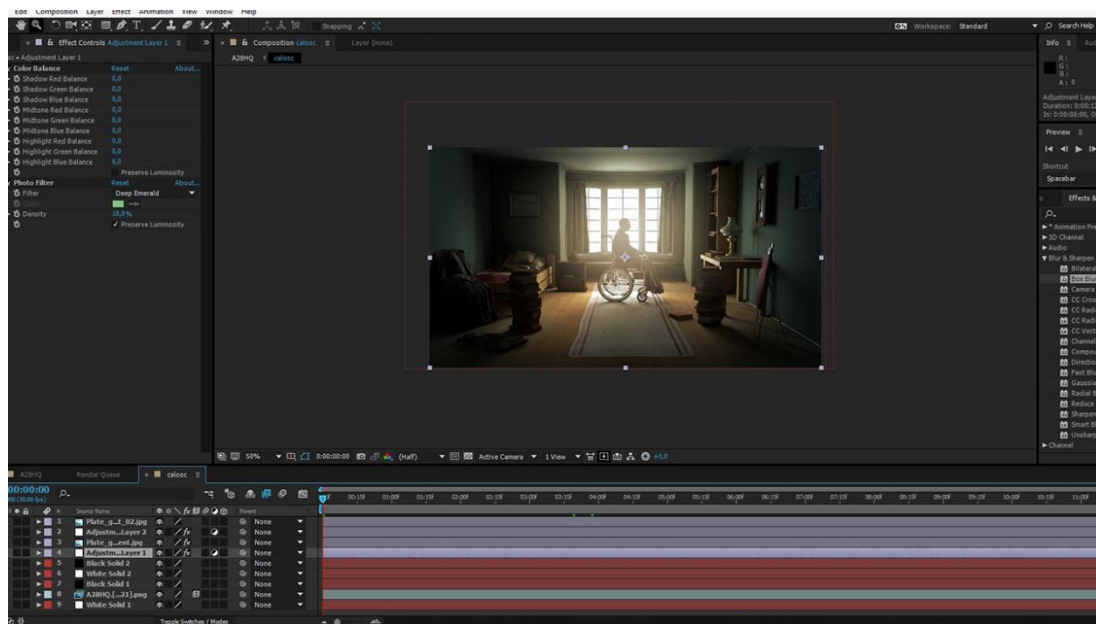


Photo 2. Interface of the program Adobe After Effects (my own source)

Montage and animation

Adobe Premiere is a program that allows professional installation and processing of video materials. Therefore it is used by TV stations and film studios. In the animation I used the program not only for the installation of scenes, but also for sound effect and for music. (photo 3).

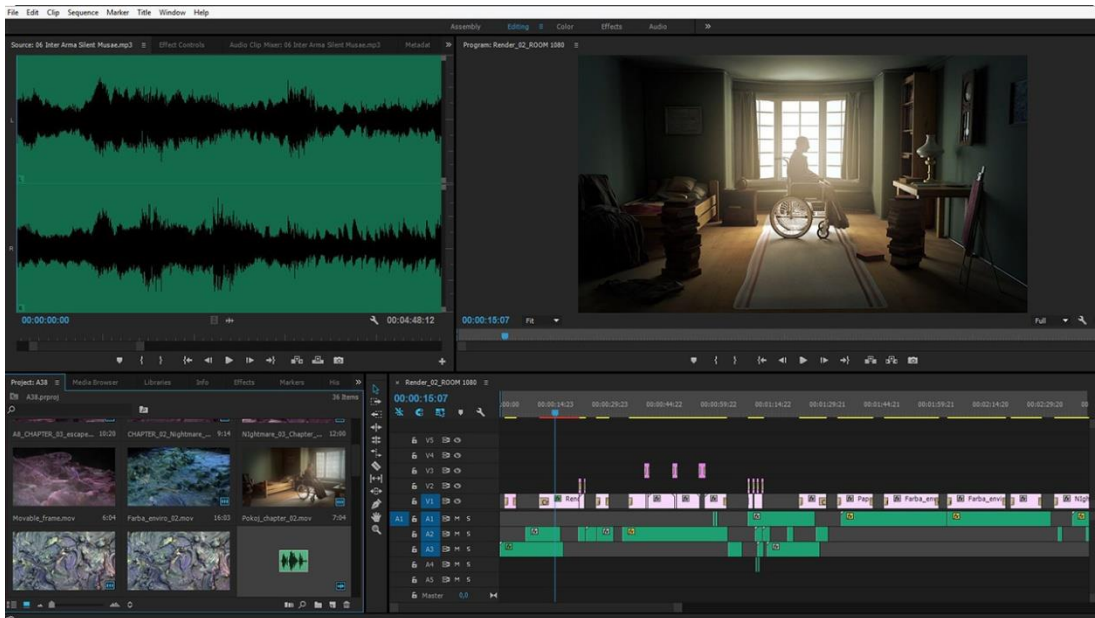


Photo 3. Interface of the program Adobe Premiere (my own source)

3D Oculus glasses

In order to enter the world of the main character, as well as to enhance the effect of the presented picture, I used virtual reality glasses Oculus. Thanks to these glasses it is possible to be almost a part of the scene in the same way as the main character of the animation. Oculus sunglasses are equipped with OLED screen with a resolution of 2160x1200 (for one eye it is 1080x1200). The image is displayed with the frequency of 90 Hz. Thanks to the technology used in the glasses it is possible to watch spatial/3 dimensional scenes with the impression of being inside the scenes (12).

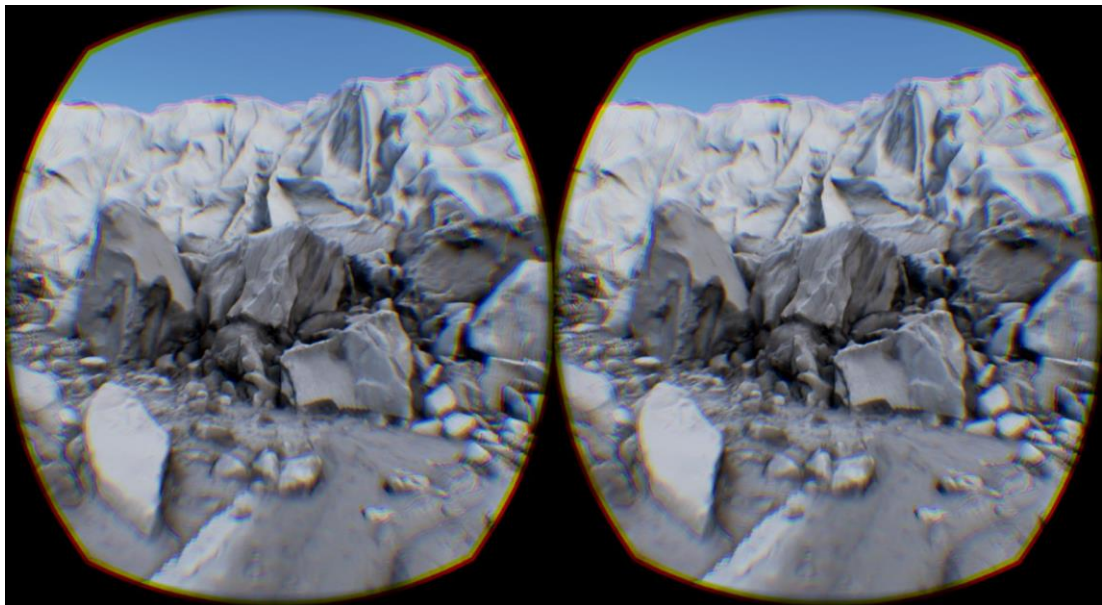
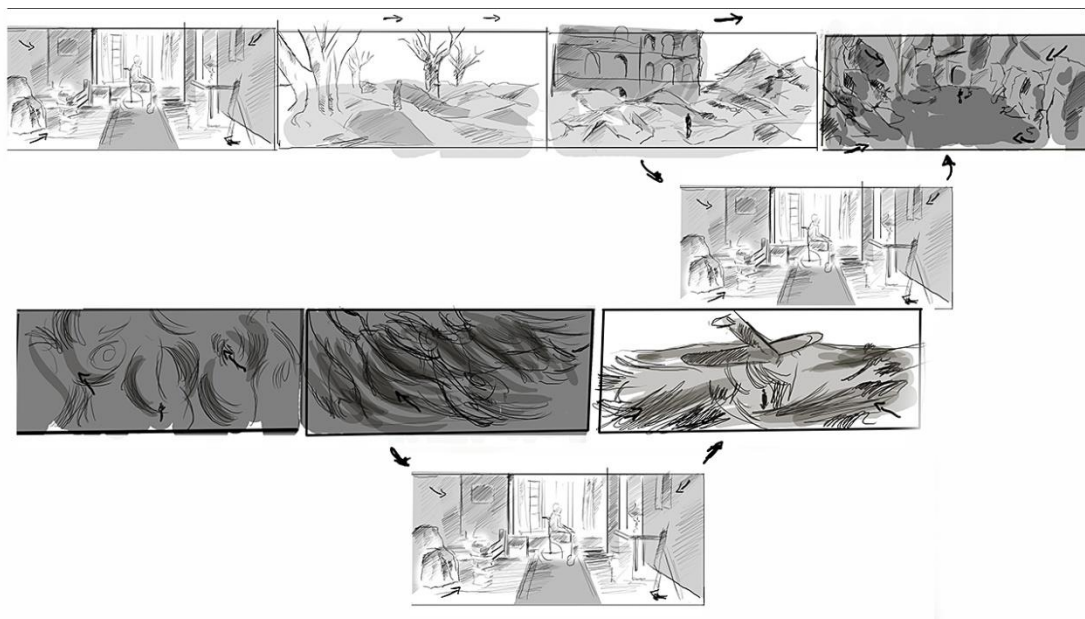


Photo 4. Image seen in Oculus Glasses DK2 (my own source)

IV. Story Board

In order to systematize the work on the animation I have prepared the initial designs of the scenes and the sequence in which they follow.



Drawing 1. Story Board

V. The process of creating some of the objects and scenes

The main character of the animation

I have made the model of the animation hero entirely in Pixologic Zbrush and Autodesk Maya programs. In order to make the texture of the character I used Adobe Photoshop.



Photo 5. The main character of the animation. 3D model without texture
(my own source)

The room

I modeled the room in Autodesk Maya program. The objects in the room are modeled with the use of the same program. I also created the objects by means of the scanning process. I was processing the scans of the objects in Pixologic Zbrush. The textures of modeled objects were made in Adobe Photoshop and the textures that were obtained by me in the scanning process I also processed in Adobe Photoshop.

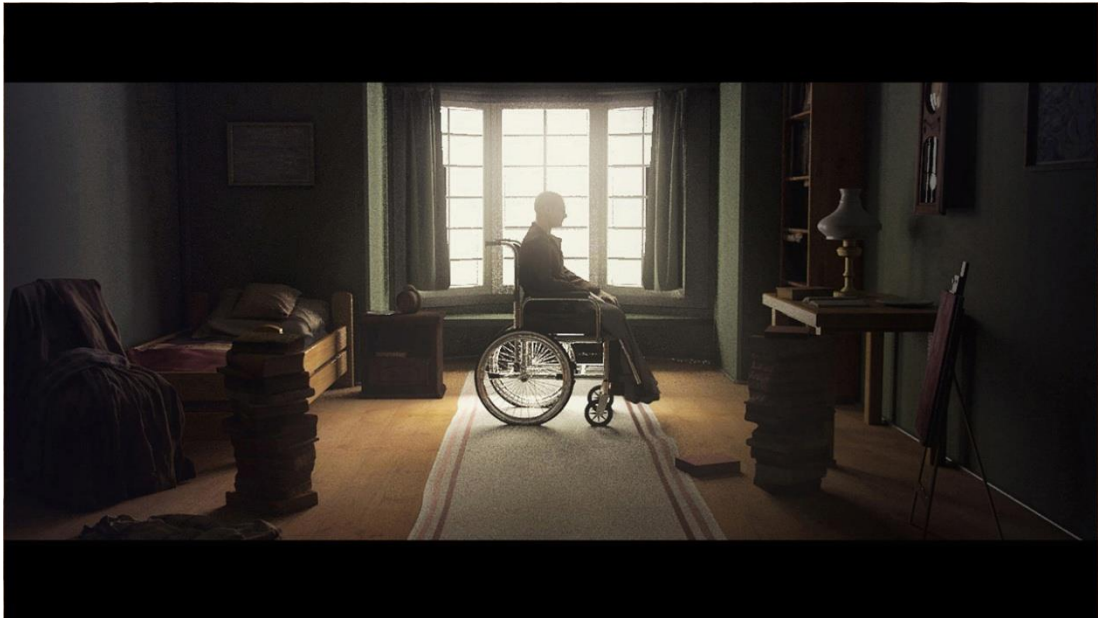


Photo 6. The room of the character (my own source)



Photo 7. On the right the clock designed for scanning, on the left the model obtained in the scanning process (my own source)

The area made of the paper structure

The object was made in the process of scanning and then processing in the Pixologic Zbrush program.

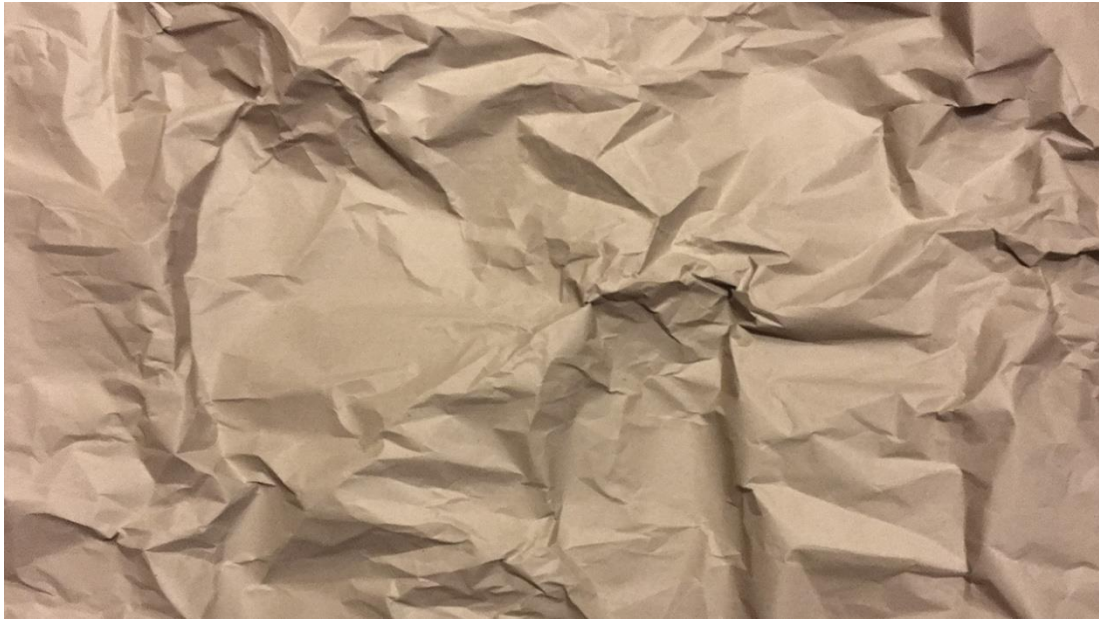


Photo 8. The piece of paper prepared for scanning (my own source)

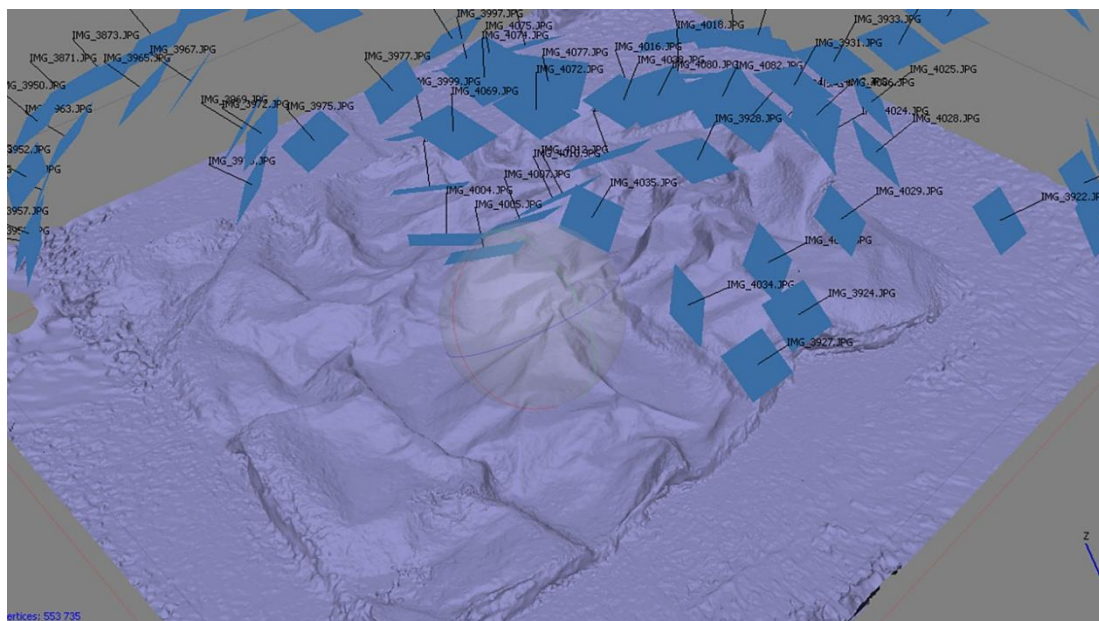


Photo 9. The scan of the piece of paper (my own source)



Photo 10. The scan of piece of paper after processing in Pixologic Zbrush
(my own source)

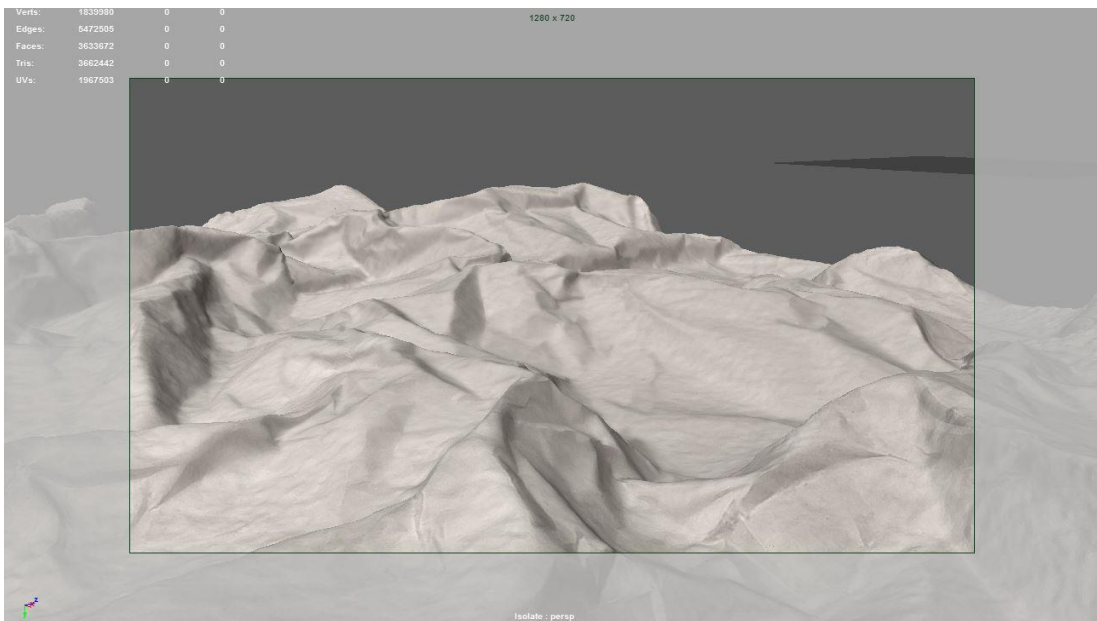


Photo 11. The scene prepared for rendering (my own source)



Photo 12. The scene of animation. Scanned paper as an area of the character's Wandering (my own source)

Tree - a model made of paper

The object was obtained as a result of making a tree model of paper and scanning it in the shadow-free tent, then processing the scan in Pixologic Zbrush.

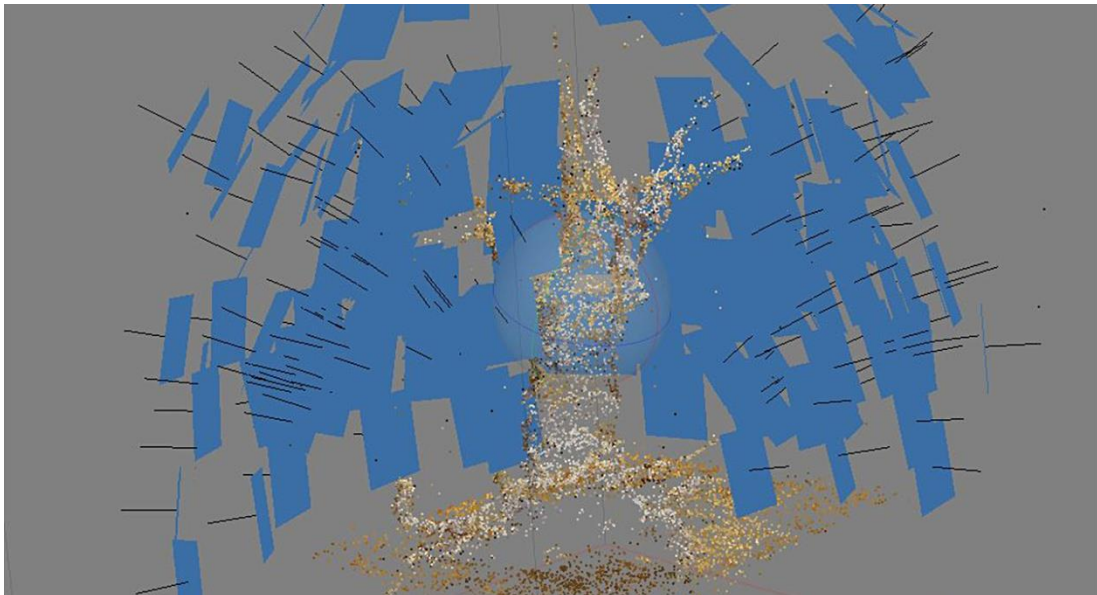


Photo 13. The cloud of points which was the effect of scanning of a paper tree Model (my own source)



Photo 14. The scan of a paper tree model after processing it in Pixologic Zbrush
(my own source)

The realistic tree

I obtained the realistic tree image which appears in animation in the process of scanning the tree in the field. After processing the model in Pixologic Zbrush I put the realistic texture which was made in the process of scanning on the object.



Photo 15. The tree in the field chosen for scanning (my own source)

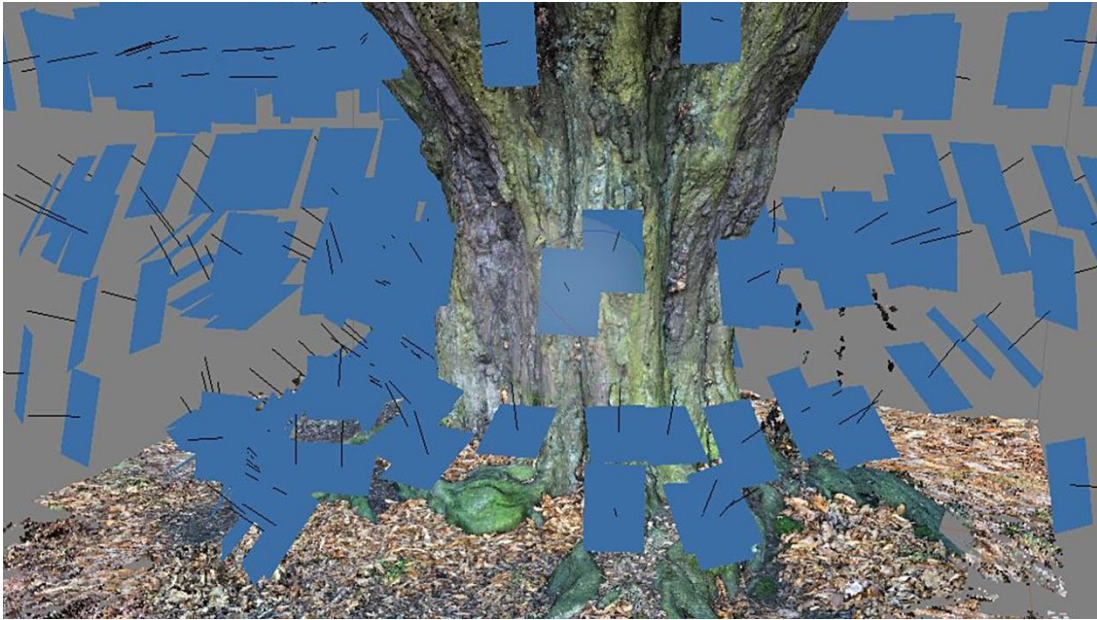


Photo 16. The tree in the process of scanning (my own source)



Photo 17. The final scan of a tree with a photo-realistic texture applied on it
(my own source)

Valley

I made the valley in which the main character of the animation wanders from clay and then I scanned it. After processing it in Pixologic Zbrush I covered it with the texture obtained from the scan.



Photo 18. The part of the valley model made of clay (my own source)

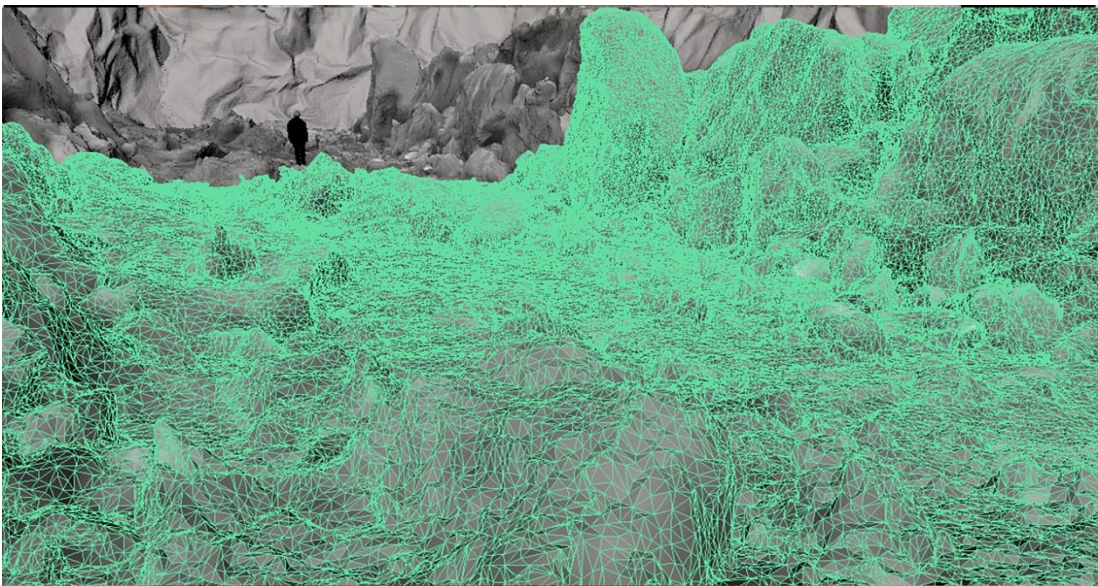


Photo 19. The net on the scanned valley (my own source)



Photo 20. The scene of animation. The valley after scanning and processing it in Pixologic Zbrush (my own source)

The paint

In order to obtain the threatening dark world of traumatic memories of the hero I used a procedure which was based on scanning the surface of thick oil paint applied on canvas. I introduced a camera into the depth of scanned surfaces, which allowed me to show each trace of brush stroke and to present the smallest details of paint. The obtained rich structure of paint in macro scale became the area of the character's wandering. I subjected the scan of paint to a detailed processing in Pixologic Zbrush, and then I covered it with texture obtained in the process of scanning.



Photo 21. Thick layers of oil paints on canvas, put in a shadow-free tent
(my own source)

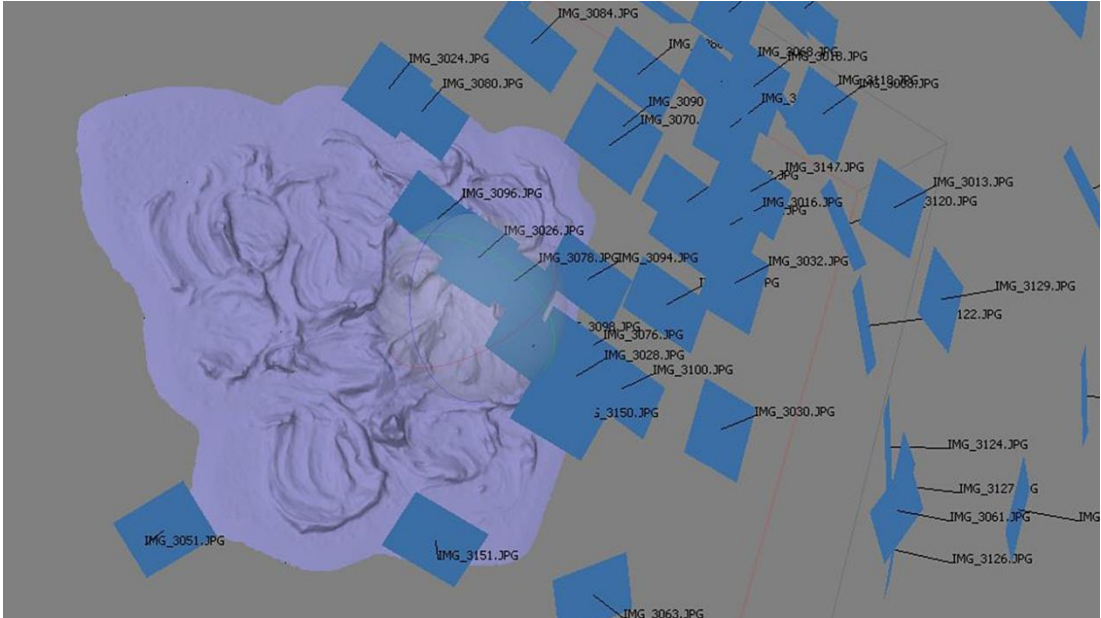


Photo 22. The paint during scanning (my own source)

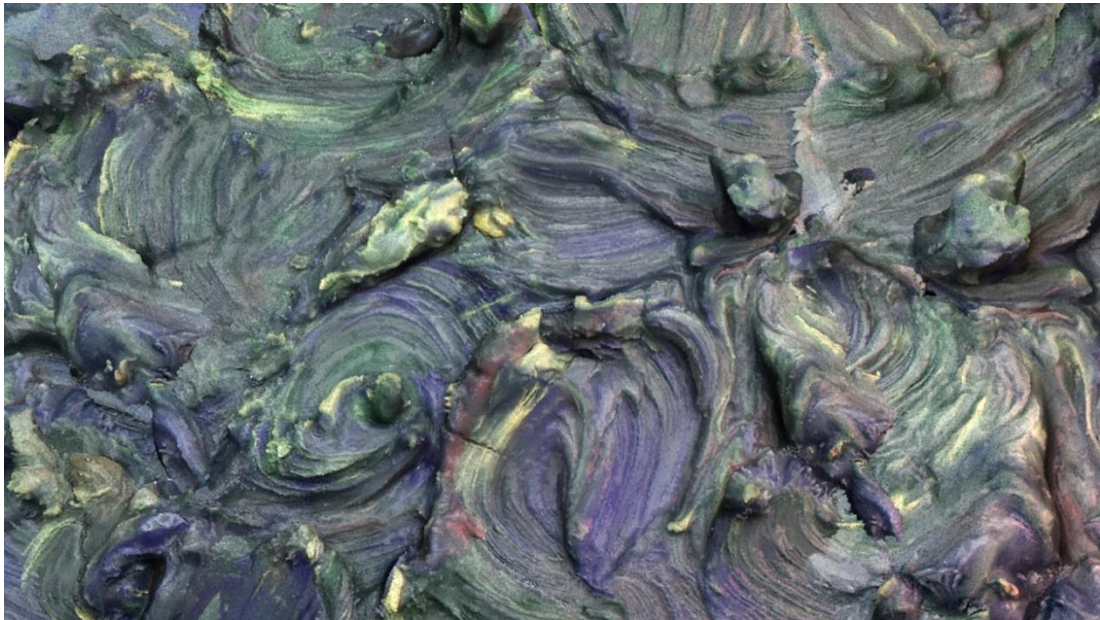


Photo 23. The final scan of the paint after processing and applying texture
(my own source)

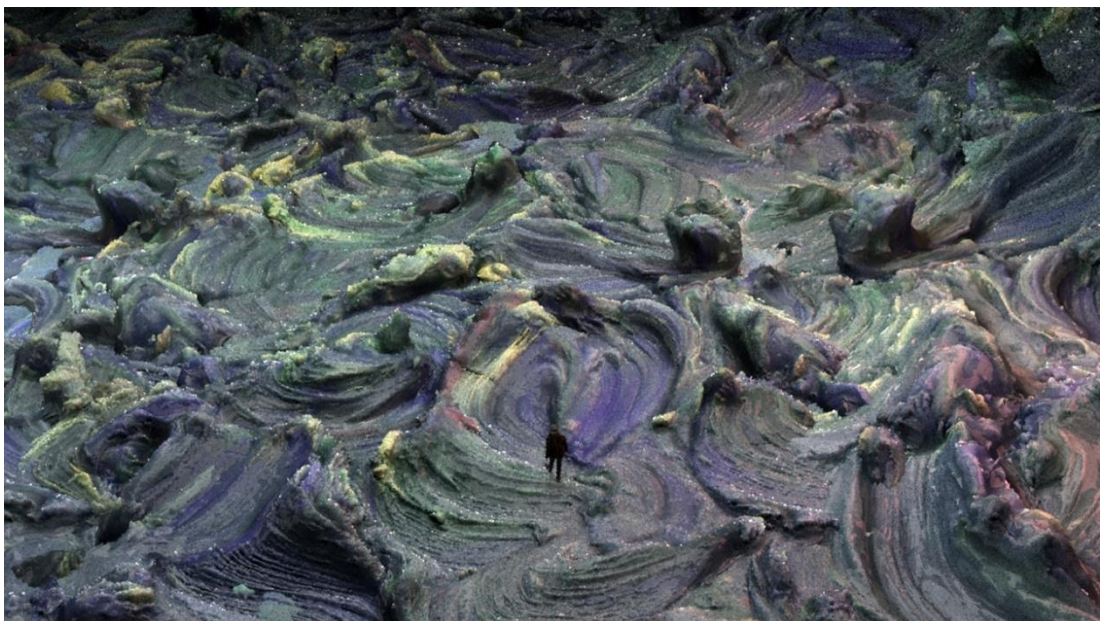


Photo 24. The scene of an animation. The paint as an area in the world of hero
traumatic memories (my own source)

VI. Literature:

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VII. Annex

Photo 1. 3D Scanner (my own source)

Photo 2. Interface of the program Adobe After Effects, (my own source)

Photo 3 Interface of the program Adobe Premiere, (my own source)

Photo 4. Image seen in Oculus Glasses DK2 (my own source)

Photo 5. The main character of the animation. 3Dmodel without texture
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Photo 21. Thick layers of oil paints on canvas, put in a shadow-free tent,
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Photo 22. The paint during scanning, (my own source)

Photo 23 The final scan of the paint after processing and applying texture,

(my own source

Photo 24. The scene of an animation. The paint as an area in the world of hero
traumatic memories, (my own source)

Drawing 1. Story Board