

Study of the conception, history and creation of silicon-based painting

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- Conceptual and Subject Studies in Silicon-Based Painting: Space, Immateriality and Information Expression
- Relationship and Methodology of Silicon-based Painting: A Discussion on the Relationship between Digital and Substance Based on Painting and Media Transformation
- The Practice and Creation of Silicon-based Painting: From Intervention to Germination

Study Of The Conception, History And Creation Of Silicon-based Painting

1 Conceptual And Subject Studies In Silicon-based Painting: Space, Immateriality And Information Expression

Theoretical Research On Breaking Through The Dilemma Of Painting Under The Concept Of Spacialism

On The Materiality And Immateriality Of Painting: Take Fontana's "Luce Spaziale" As An Example

The Concept, Context And Subject Of Silicon-based Painting

2 Relationship And Methodology Of Silicon-based Painting: A Discussion On The Relationship Between Digital And Substance Based On Painting And Media Transformation

From The Virtual To The Digital Reality: A Study On The Relationship Between Digital And Substance In Painting

Fabrication - As A Method Of Painting Creation

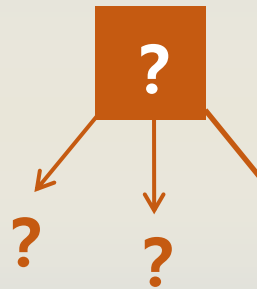
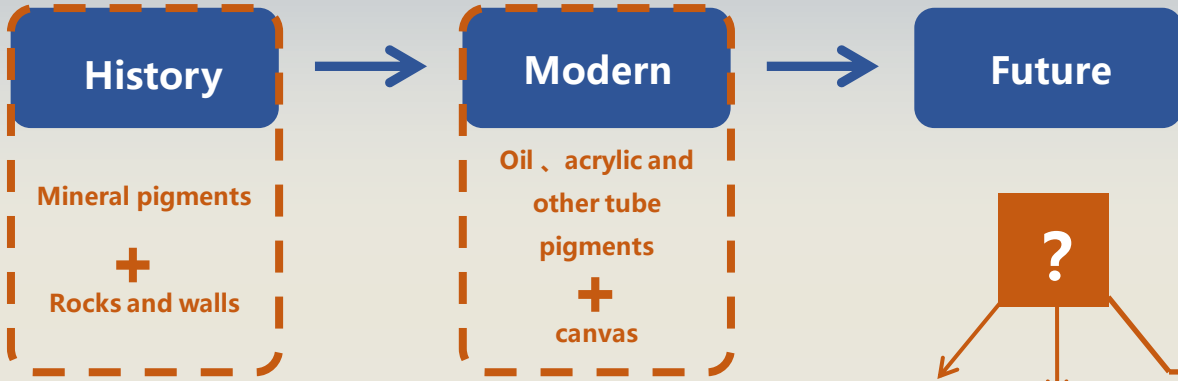
Data Visualization And Value Analysis From The Perspective Of Artistic Creation

3 The Practice And Creation Of Silicon-based Painting: From Intervention To Germination

Development And Application Of Painting Automation System Based On Flat Lines

From Data Visualization To Digital Materialization: Research As A Digital Method Of Artistic Creation

Importance



Silicon-based painting

Today

History

Future

The development of painting

The development trend of future science and technology and the exploration of new ways of painting

Conception, method, material

Conceptual and Subject Studies in Silicon-Based Painting: Space, Immateriality and Information Expression

- Theoretical research on breaking through the dilemma of painting under the concept of Spacialism
- On the materiality and immateriality of painting: Take Fontana' s work "Luce spaziale" as an example
- The concept, development context and subject of silicon-based painting

- **Theoretical research on breaking through the dilemma of painting under the concept of Spacialism**

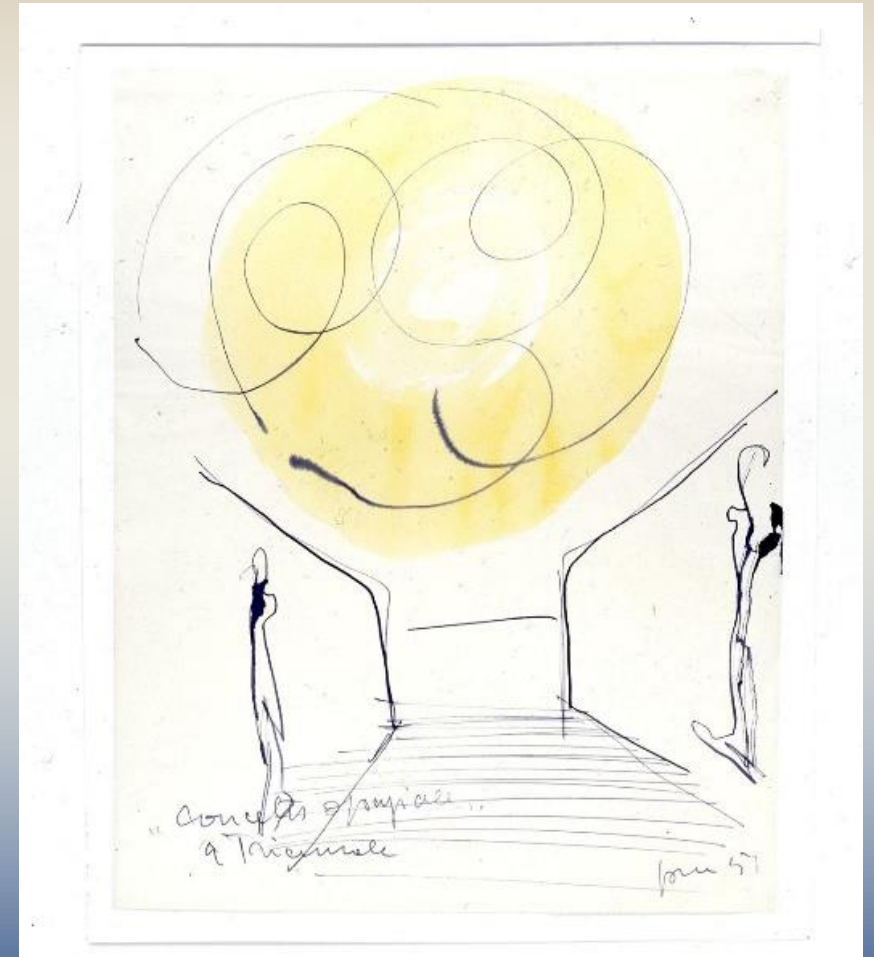
In this essay I suggest that flat thinking is one of the reasons that hinders the multiplicity of creativity in painting today, discuss in detail the implications of spatialist ideas for breaking the 'two-dimensional bondage' of painting, and emphasise the spatial nature of painting, particularly in the creation of paintings. This part of the study has been completed.



- **On the materiality and immateriality of painting:
Take Fontana 's work "Luce Spaziale" as an example**

However, I also found that on this basis, I could not discuss the topic of digital and silicon-based abruptly, and I needed to make enough elaboration and emphasis on the immateriality of painting, so as to make the necessary theoretical foreshadowing for the later exploration of painting theory towards digitalization.

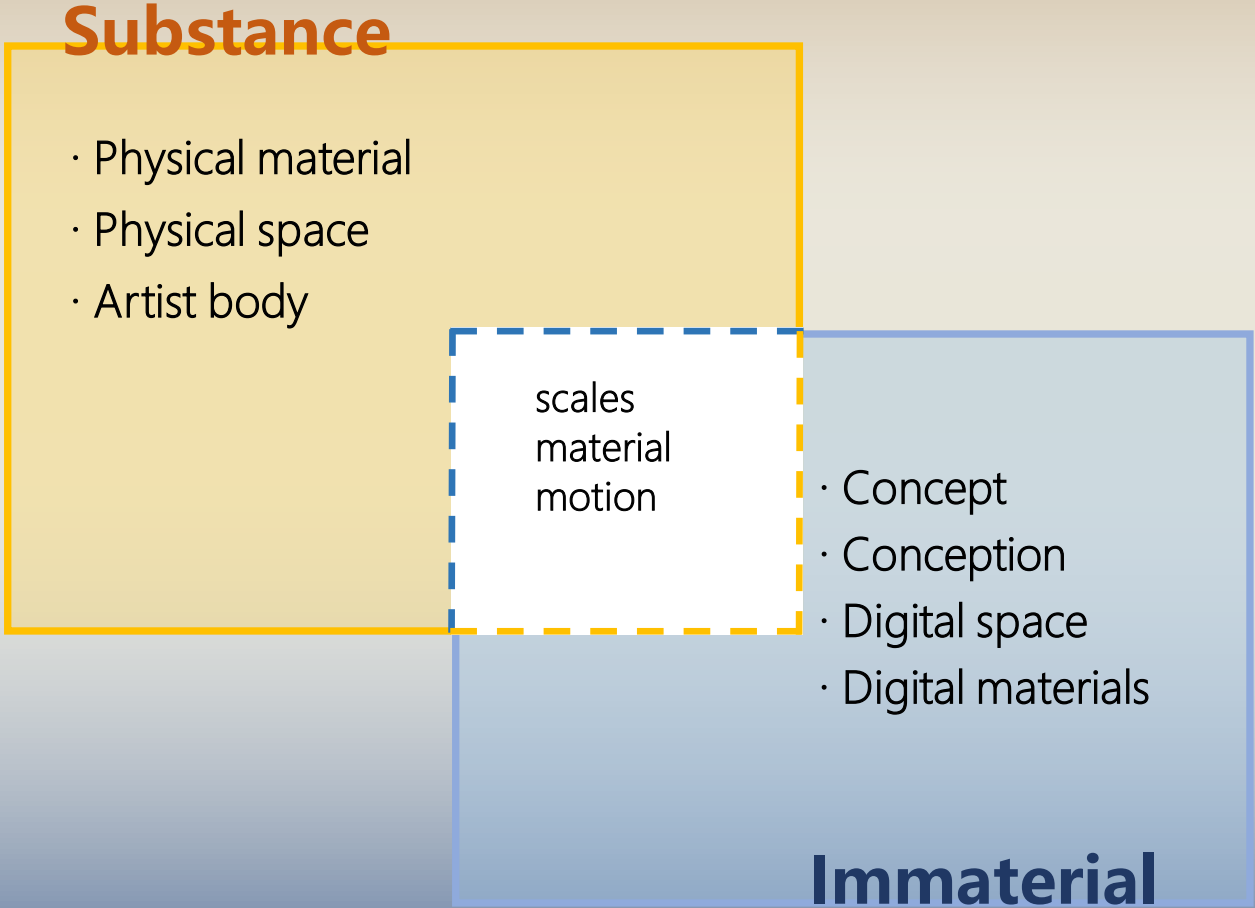
In this part, I will discuss in detail the immateriality of Fontana's creative principles and the immaterial aspects of each link from the conception, manuscript, medium and final work of the work "Luce Spaziale". It is tried to prove that the method of digital intervention in painting creation is not only the influence of digital technology environment on painting, but also the intrinsic needs of artists in painting creation, and speculates that with the rapid development of digital technology, more non-material media, especially silicon-based media, will be more and more involved in the painting creation of artists.



• The concept, development context and subject of silicon-based painting

With the above in mind, here I will focus more on the interpretation of silicon-based painting. I will first describe the various dimensions of silicon-based painting, attempting to define in detail what silicon-based painting is in this era, and will follow these criteria to sort out the current state of development of silicon-based painting and its context. Finally, I will present an overall and general discussion of the future of silicon-based painting.

This section is the first overall or general overview and description of the concept of silicon-based painting in the whole doctoral study, and the theory in this section may be a little thin and will need to be further enriched in later chapters.



Relationship and Methodology of Silicon-based Painting: A Discussion on the Relationship between Digital and Substance Based on Painting and Media Transformation

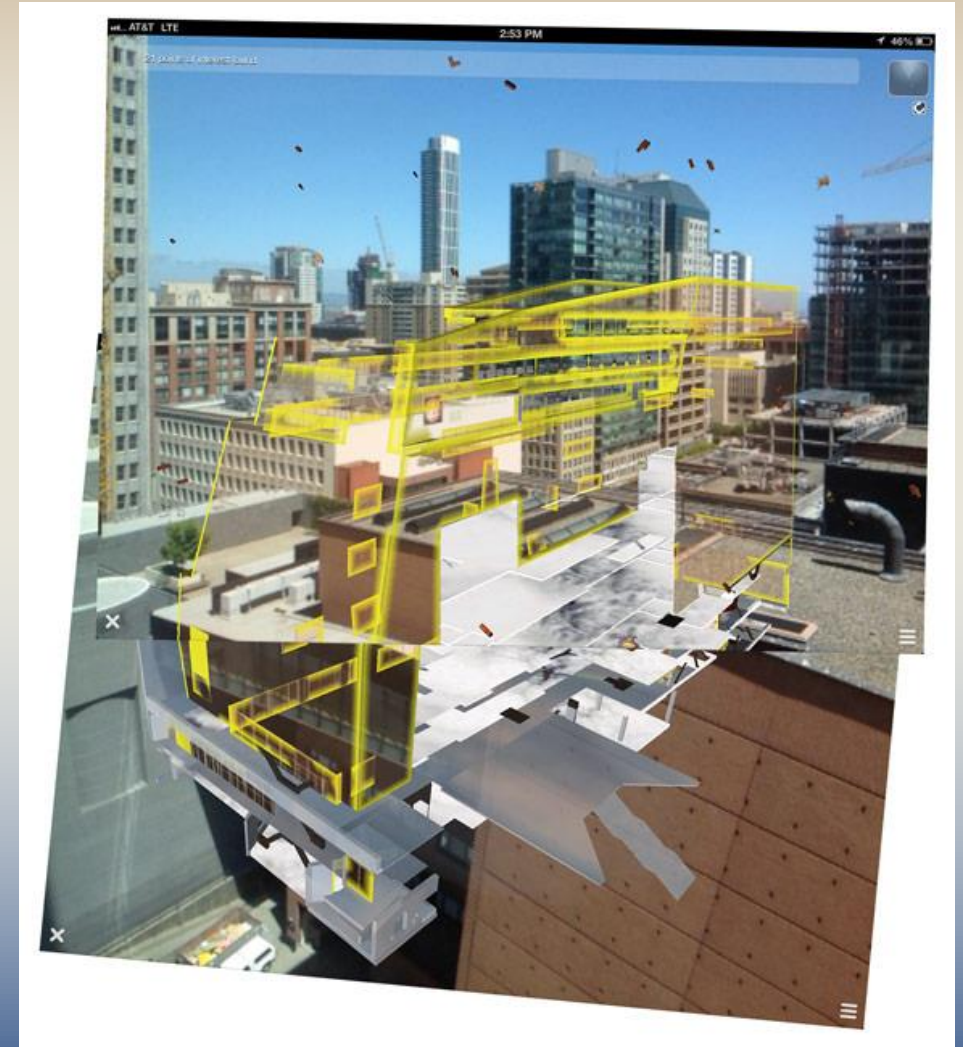
- From the virtual to the digital reality: a study on the relationship between digital and substance in painting
- Medium mutual translation in the creation of silicone-based paintings
- Fabrication – as a method of painting creation
- Data visualization and value analysis from the perspective of artistic creation

Relationship and Methodology of Silicon-based Painting:

A Discussion on the Relationship between Digital and Substance Based on Painting and Media Transformation

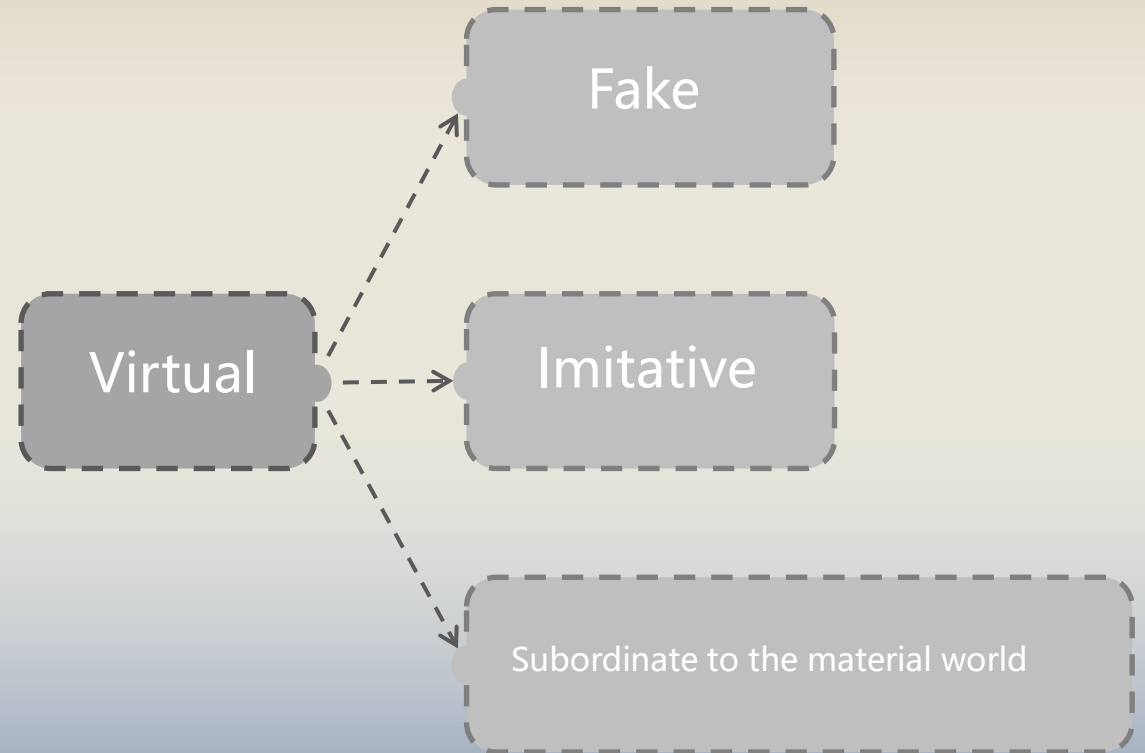
- **From the virtual to the digital reality: a study on the relationship between digital and substance in painting**

This section continues the conceptual part of silicon-based painting from the previous chapter and summarises several dimensions of silicon-based painting, including the characteristics of each type of painting and its potential value, such as virtual reality painting, painting automation and intelligent generation. The obvious relationship here is between silicon-based painting and traditional painting, but I also quickly discovered that silicon-based painting is not antithetical to traditional painting; the central issue is one of the relationship of the medium, that is to say the antithesis is the relationship between digital and substance and new ideas in creation. It is particularly important to elaborate on the relationship between digital and substance in silicon-based painting.



- **From the virtual to the digital reality: a study on the relationship between digital and substance in painting**

In this section, I will focus on the limitations of the concept of "virtual" and its fundamental difference from the concept of "digital", and propose that the real world consists of two dimensions: the material world and the digital world. By emphasizing the independence of the digital world, I will also explore possible directions and methods for the development of silicon-based painting, in order to prepare theoretically for practice.



Relationship and Methodology of Silicon-based Painting:

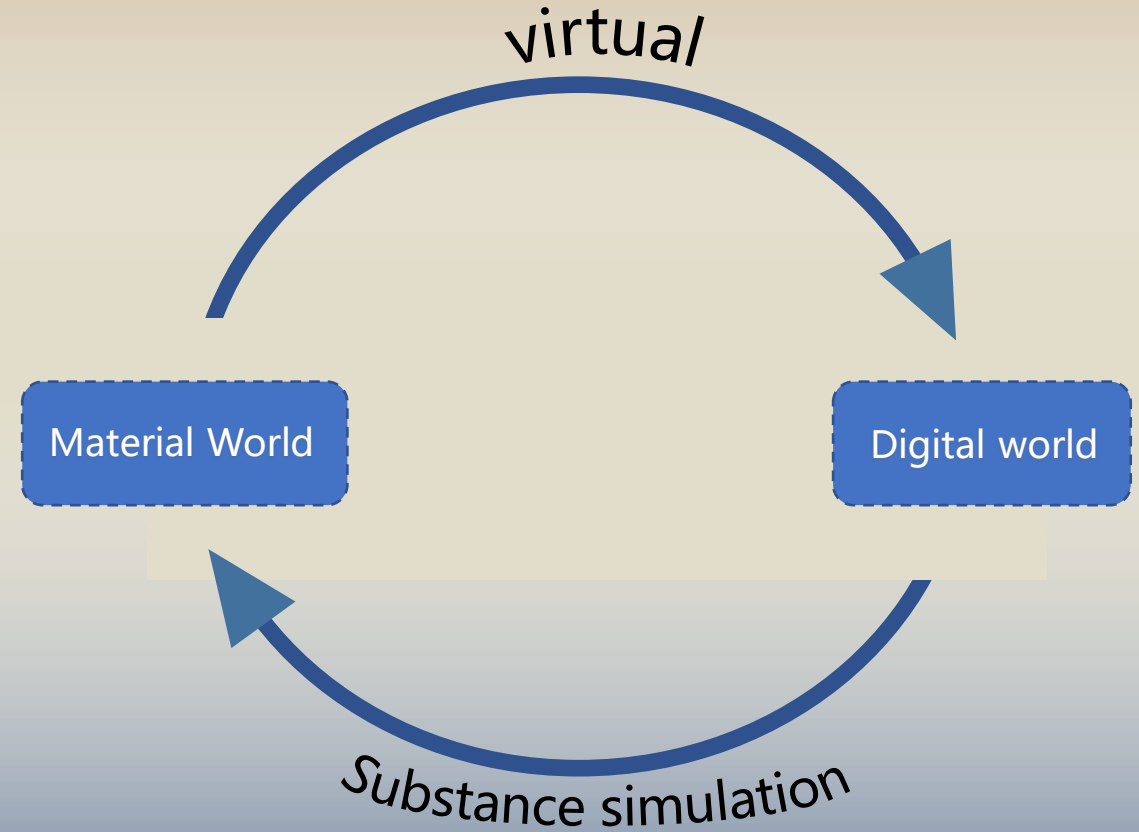
A Discussion on the Relationship between Digital and Substance Based on Painting and Media Transformation

- **Medium mutual translation in the creation of silicone-based paintings**

The previous part focused on the relationship between digital and substance in silicon-based paintings, and this part will further emphasize the binary opposition between digital and substance based on the previous part.

The previous part emphasized the transformation of the material world into the digital world, and this part will discuss the possibility of realizing a creative method diametrically opposed to the "virtual" method through digital generation and materialization of digital content on the basis of recognizing the objectivity, reality and independence of the digital world. It is worth mentioning that the "truth" here refers to the "digital world", that is, the use of physical material to simulate digital characteristics and their logic.

I personally expect this idea to inspire contemporary art creators. That is, again I also made a prediction that one of the themes of future visual art creation may be the cross-translation of digital and substance, that is, art becomes the medium of escape. In this way, the concept of silicon-based painting is more fleshed out.



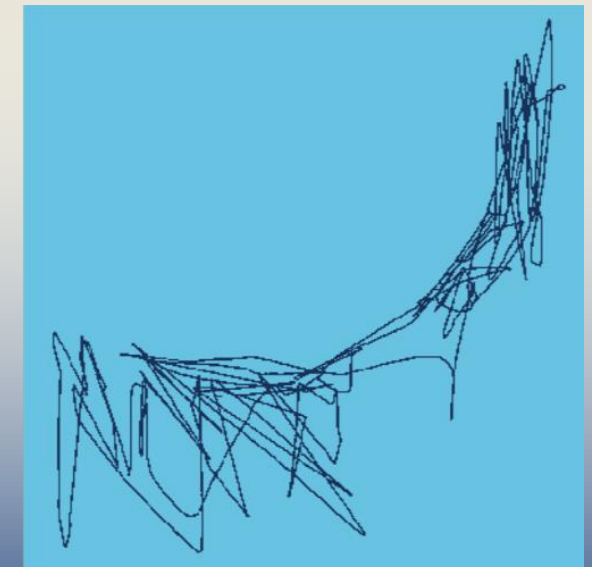
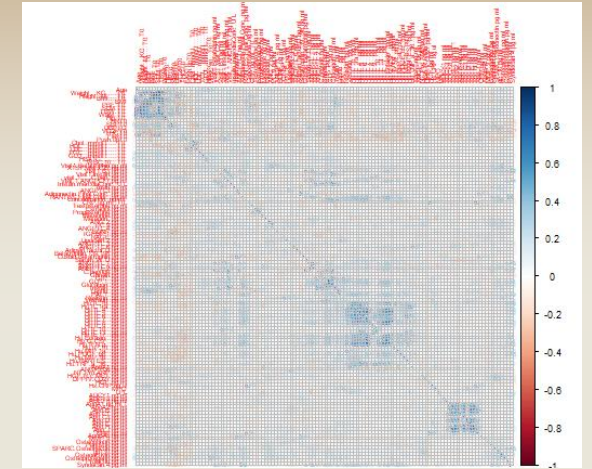
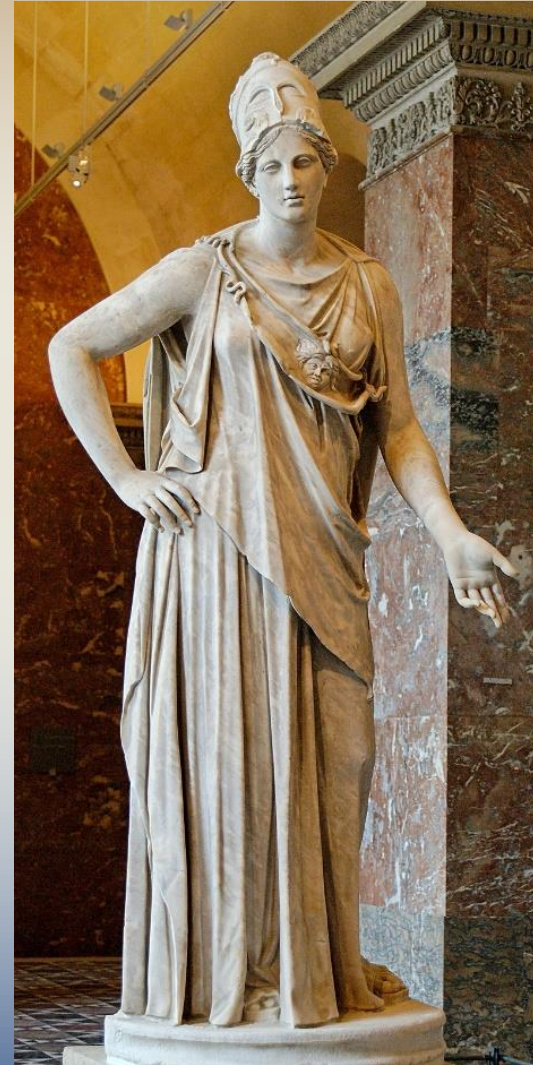
• Fabrication – as a method of painting creation

A theoretical section is added here to discuss the nature of painting and the methodological issues that underpin the practical section.

In my personal opinion, one of the main functions of painting is to present to the world images or scenes that do not exist, are unattainable or unimaginable, whether they are classical or modern paintings. In other words, one of the fundamental methods of painting is fabrication.

This approach is still valid in the context of silicon-based painting. This notion may contain two or more inspirations, firstly that digital features and logic are completely abstract and unseen, and secondly that data itself can be fabricated and that we can make it perceptible or materialise it in a multifaceted way, thus enabling the artistic creation of painting.

This section establishes the methodological basis for the subsequent practice, which will also continue to be discussed subsequently.

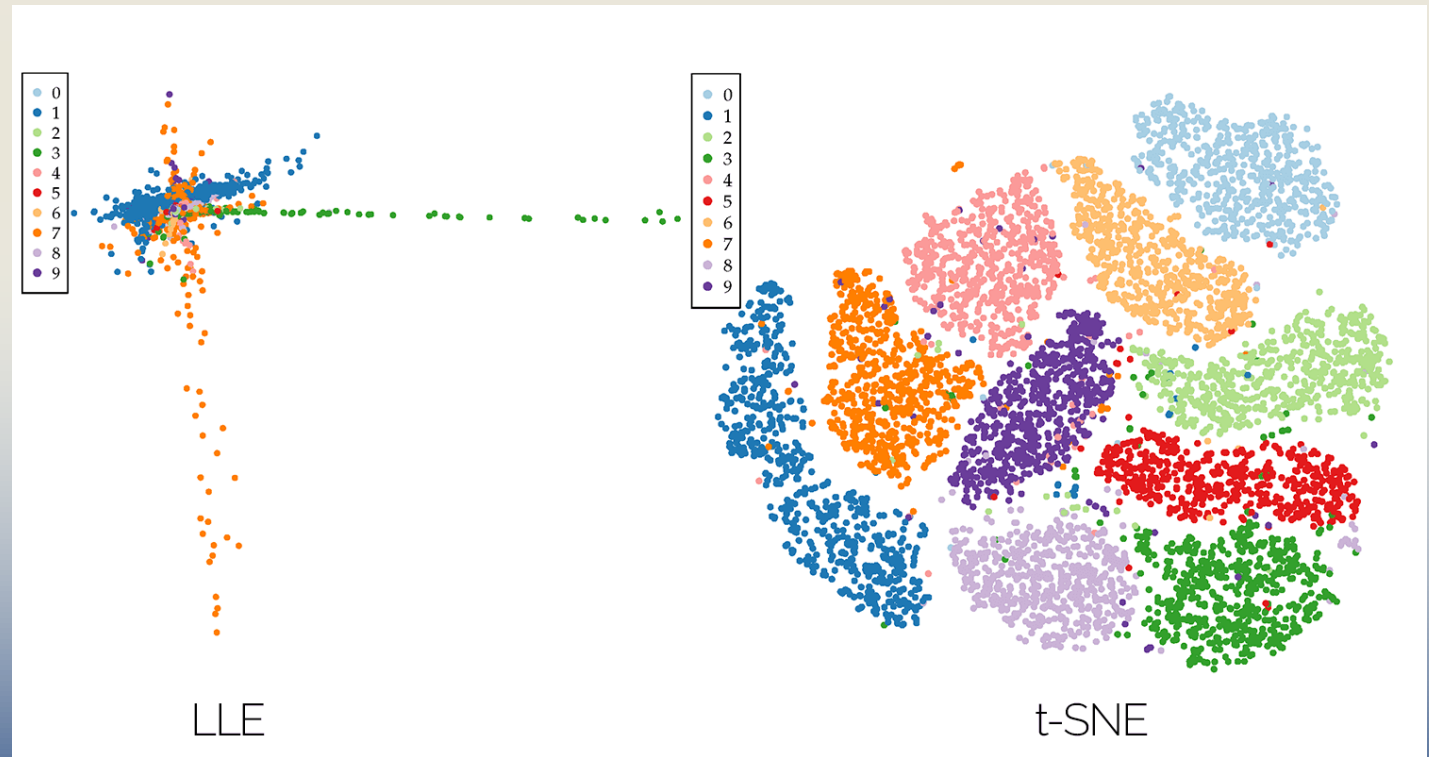
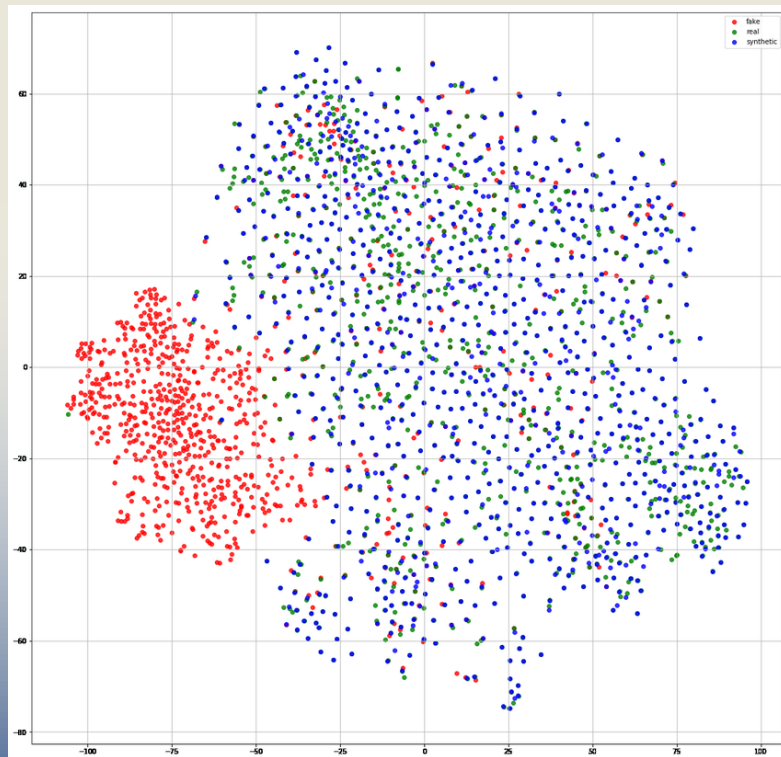


Relationship and Methodology of Silicon-based Painting:

A Discussion on the Relationship between Digital and Substance Based on Painting and Media Transformation

- **Data visualization and value analysis from the perspective of artistic creation**

This section continues the previous part, emphasizing the aesthetic value of data visualization works and their potential as a method of painting creation through the appreciation of specific cases.



The Practice and Creation of Silicon-based Painting: From Intervention to Germination

- Development and application of painting automation system based on flat lines
- From data visualization to digital materialization: research as a digital method of artistic creation

The Practice and Creation of Silicon-based Painting: From Intervention to Germination

In the previous chapter, I divided silicon-based painting into virtual reality painting, automated painting, generative painting, and so on. I also expressed my concerns about the limitations of virtual technology as silicon-based painting, so in the practical session, I chose to explore two fields, automation and intelligent generation, in order to bring us more surprises in the creation of paintings in these fields.

- Development and application of painting automation system based on flat lines
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The Practice and Creation of Silicon-based Painting: From Intervention to Germination

- **Development and application of painting automation system based on flat lines**

Please allow me to call this system "torchand", because my name is Li Ju, and Ju in Chinese means torch. The obvious meaning is that I want this system to replace my hands, or furthermore, my manual work.

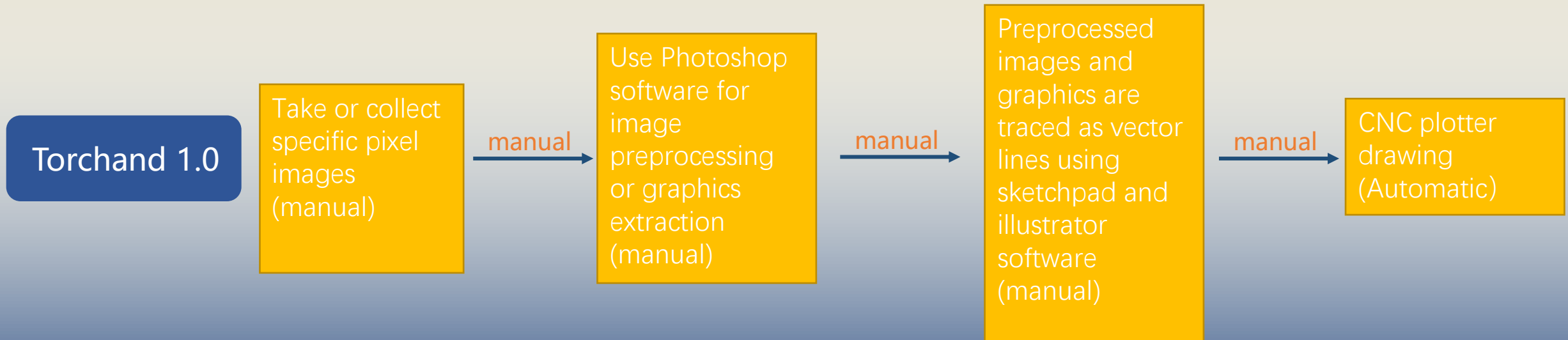
The system is expected to be implemented in three versions before I finish my PhD, namely version 1.0, version 2.0 and version 3.0.

The Practice and Creation of Silicon-based Painting: From Intervention to Germination

• Development and application of painting automation system based on flat lines

Torchand 1.0

The lower version of Torchand can be thought of as a "painting powerhouse", with the hardware consisting of a PC and a CNC machine that holds the brushes in place. The creation process is roughly as follows: the artist manually photographs or collects a specific pixel image, manually puts it into the Photoshop software, manually pre-processes or extracts the image in the software and stores it manually, manually puts the material stored in the previous step into the illustrator software, manually traces the pixel material into a vector line drawing using a hand drawing pad and stores it, manually stores the line drawing stored in the previous step. The line drawings from the previous step are manually imported into the cnc machine for debugging, and the work is finally completed by the cnc machine.



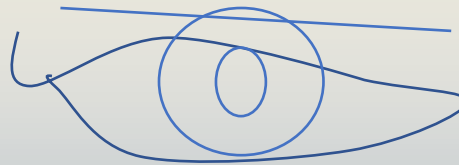
• Development and application of painting automation system based on flat lines

Torchand 1.0

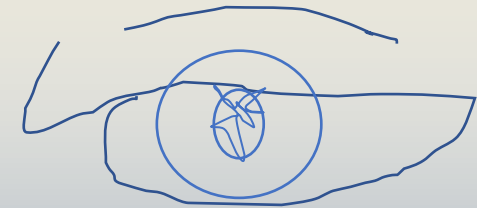
With this device, the artist can combine hand-drawn lines with conceptual machine lines in the work, as shown in the picture, thus revealing a line drawing language that combines human gestures with machine gestures, i.e. a line drawing language between hand drawing and graphic design formed by the interplay of the above three methods. The expressive power of machine hand drawing is different to that of direct graphic airbrushing, where the pen and paper work together to create a unique visual tension that airbrushing cannot achieve. Secondly, my aim is to use modern technology to enhance the linguistic richness of hand-painting, which is still essentially hand-painted line drawing rather than graphic decorative design; the two have different connotations and consequently different standards. Thirdly, the exhibition will include a live drawing process with a robotic arm, a futuristic performance that is also part of the work itself.



Pure hand-painted lines



Conceptual lines



hand-painted and conceptual lines

The Practice and Creation of Silicon-based Painting: From Intervention to Germination

- **Development and application of painting automation system based on flat lines**

Torchand 1.0

There is a difference in the expressiveness of machine hand drawing and direct graphic airbrushing, where the pen and paper work together to create a visually unique tension that airbrushing cannot achieve. Secondly, my aim is to use modern technology to enhance the linguistic richness of hand painting, which is still essentially hand drawn line drawing rather than graphic decorative design, with different connotations and consequently different standards. Thirdly, the exhibition will include a live drawing process with a robotic arm, a futuristic performance that is also part of the work itself.

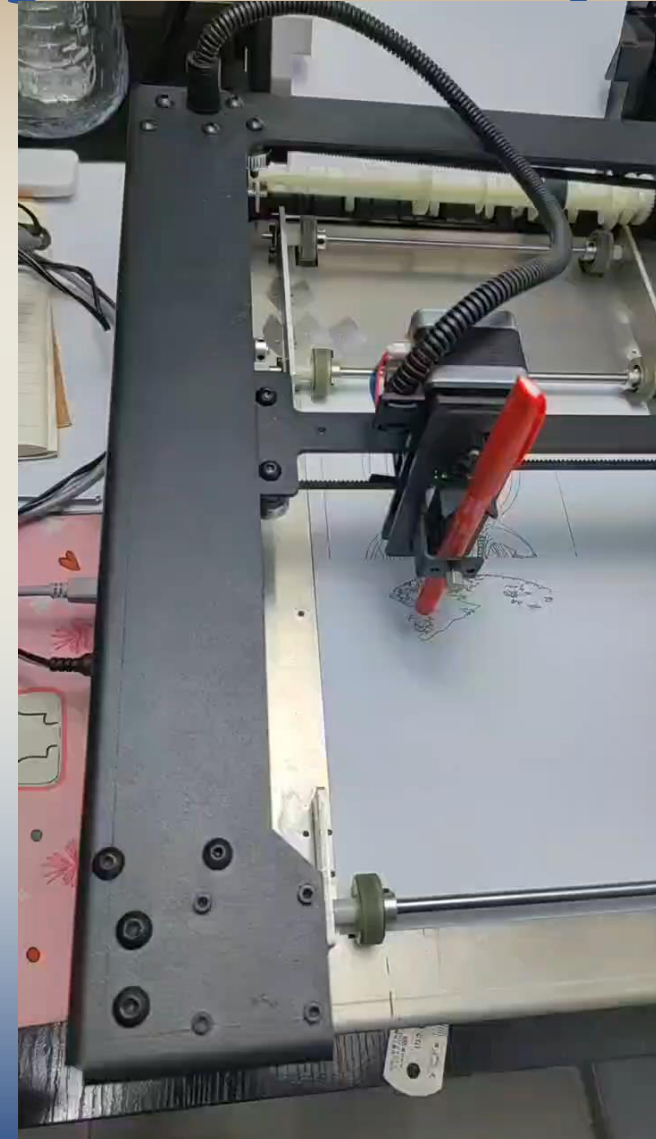


The Practice and Creation of Silicon-based Painting: From Intervention to Germination

• Development and application of painting automation system based on flat lines

Torchand 1.0

- 1、 Potential for mass production
- 2、 The ability to combine hand-drawn and geometric lines in a single work, both hand-drawn and special lines that cannot be done by hand, creating a new language of line
- 3、 Unlimited reproduction of specific elements can be selected
- 4、 The ability to make repeated adjustments and modifications in the computer (especially for difficult lines, which have a high failure rate when drawn by hand) and to have the work created by the machine in one go
- 5、 The possibility of extracting content from existing traditional works and adding new elements to form new collages



The Practice and Creation of Silicon-based Painting: From Intervention to Germination

• Development and application of painting automation system based on flat lines

Torchand 2.0

Take or collect specific pixel images (manual)

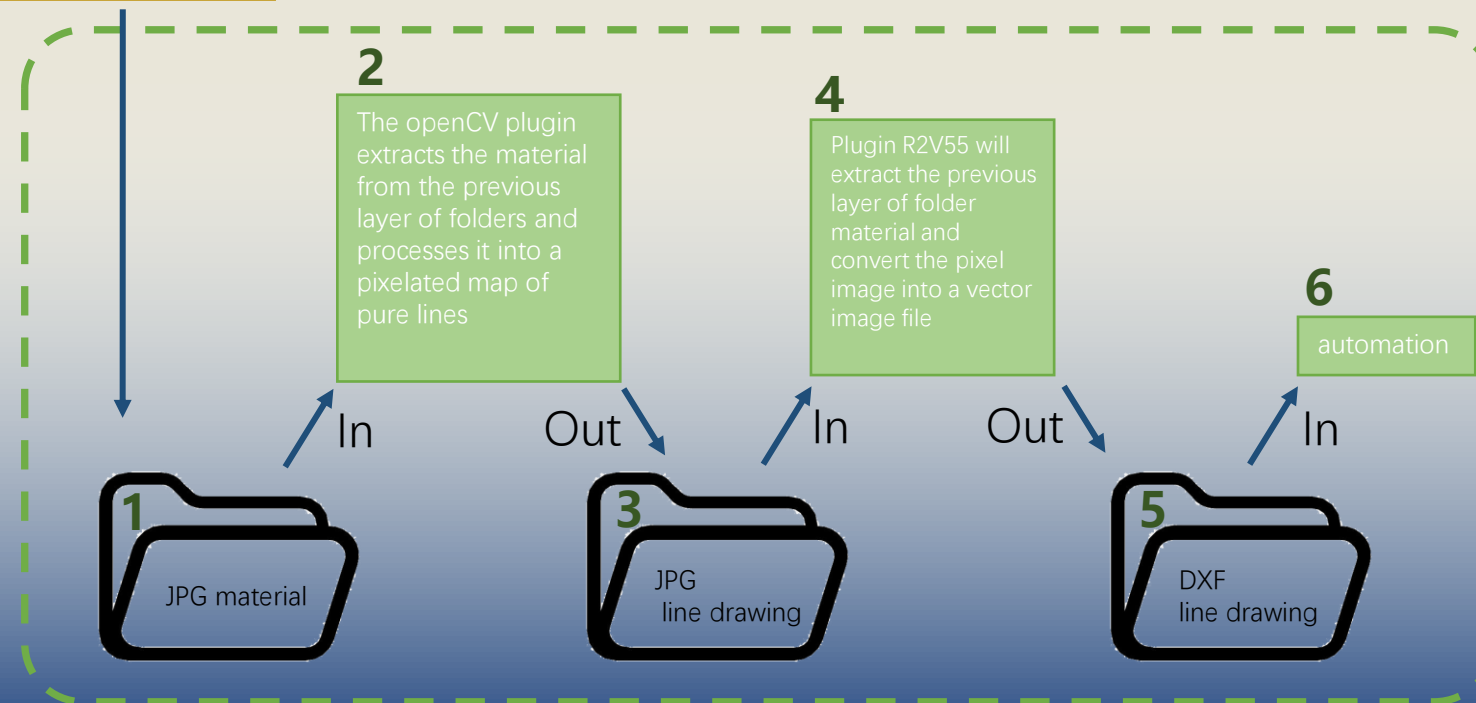
manual

Use Photoshop software for image preprocessing or graphics extraction (manual)

Torchand 2.0

This version of the system is much more automated than the lower version, as shown in the diagram. All I need to do is the first two steps, i.e. selection, reflection and judgement, to implant the pixel material into an overall program, and the various functional modules will be linked in series, without any intervention on our part until the cnc machine finishes the piece.

This aspect of the programming is now largely complete and is expected to be ready for optimisation and commissioning in mid-May.



- **Development and application of painting automation system based on flat lines**

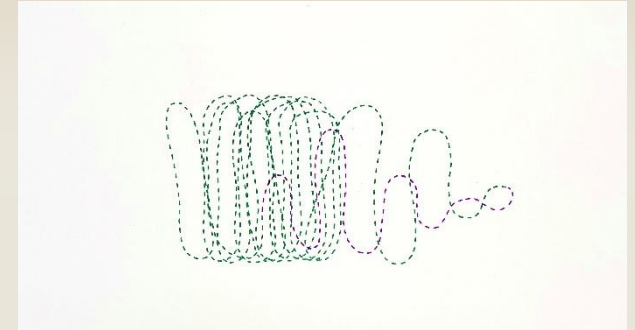
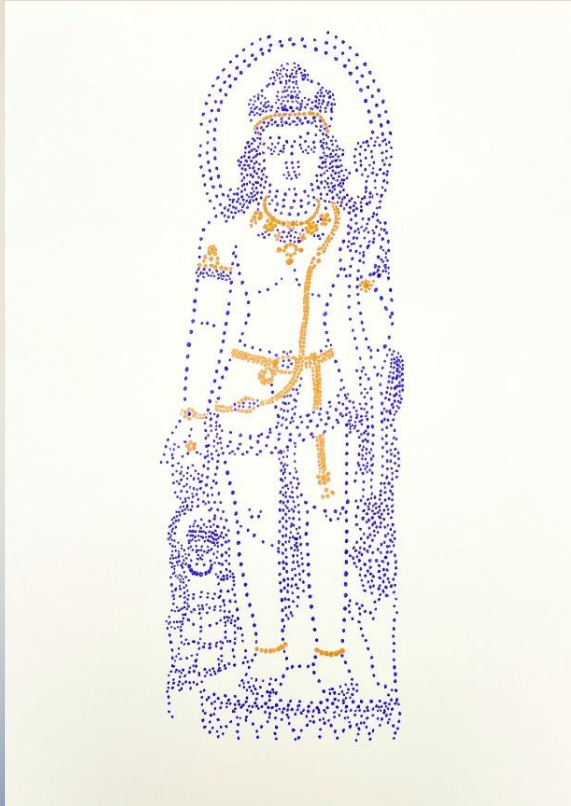
Torchand 3.0

The third version of the system will build on the above version with more technical advantages, including 1, the creation of a material library of lines to enable switching between various line languages, 2, the automatic grouping of lines in vector files to provide support for achieving the leap from monochrome to colour painting, and 3, the enhancement of larger size and higher accuracy, which, with the help of efficient work production speed, allows the accumulation of a surprising amount of work in a short time by expanding the size of the equipment, providing effective support for the leap from flat painting to space creation.



The Practice and Creation of Silicon-based Painting: From Intervention to Germination

- **Development and application of painting automation system based on flat lines**

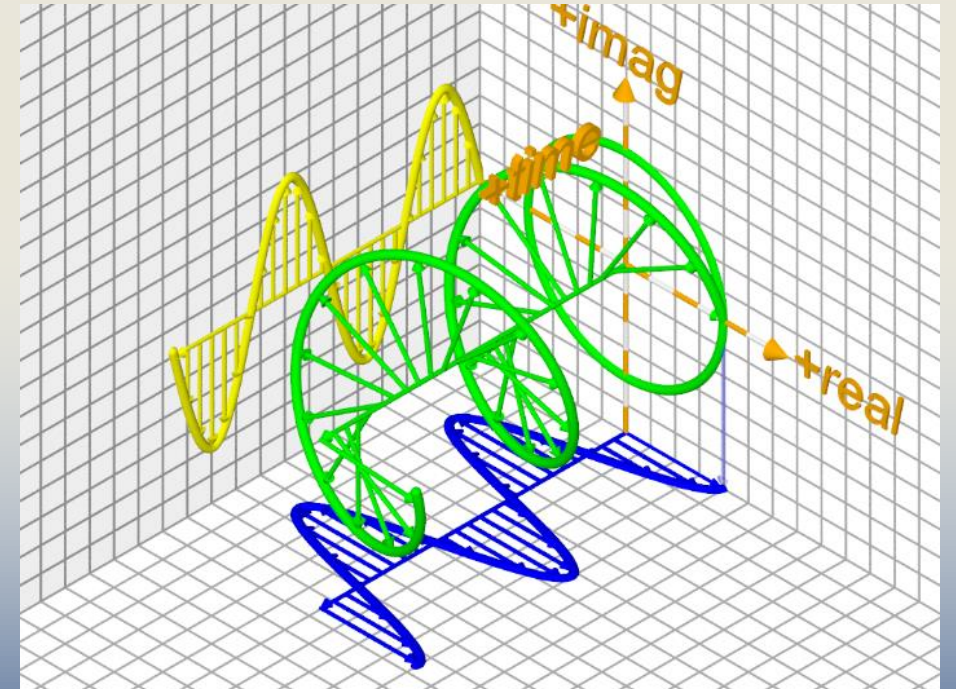
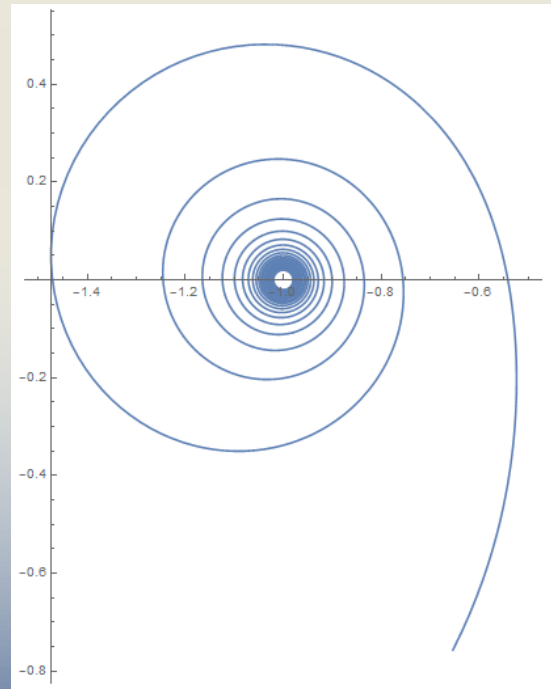
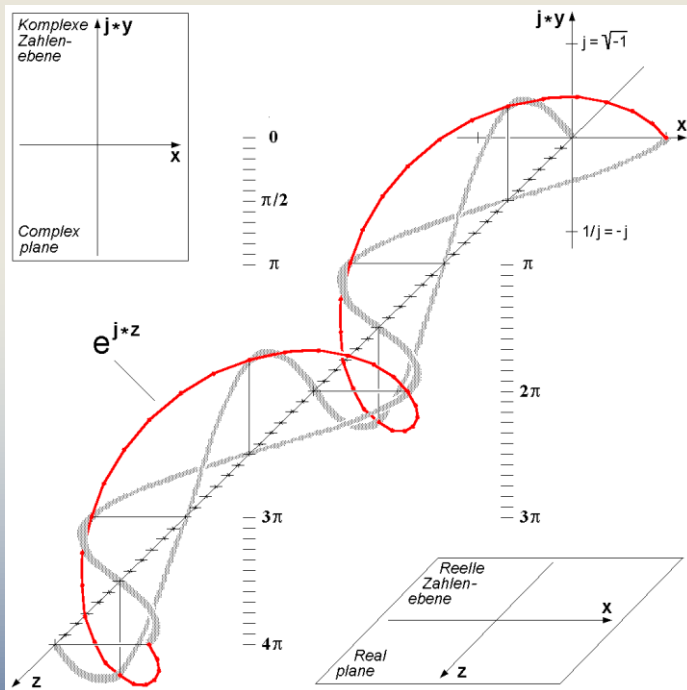


The Practice and Creation of Silicon-based Painting: From Intervention to Germination

• From data visualization to digital materialization: research as a digital method of artistic creation

Based on the methodological content of Chapter 2, I will try to visualise and materialise the creation of digital features and digital logic through visualisation techniques.

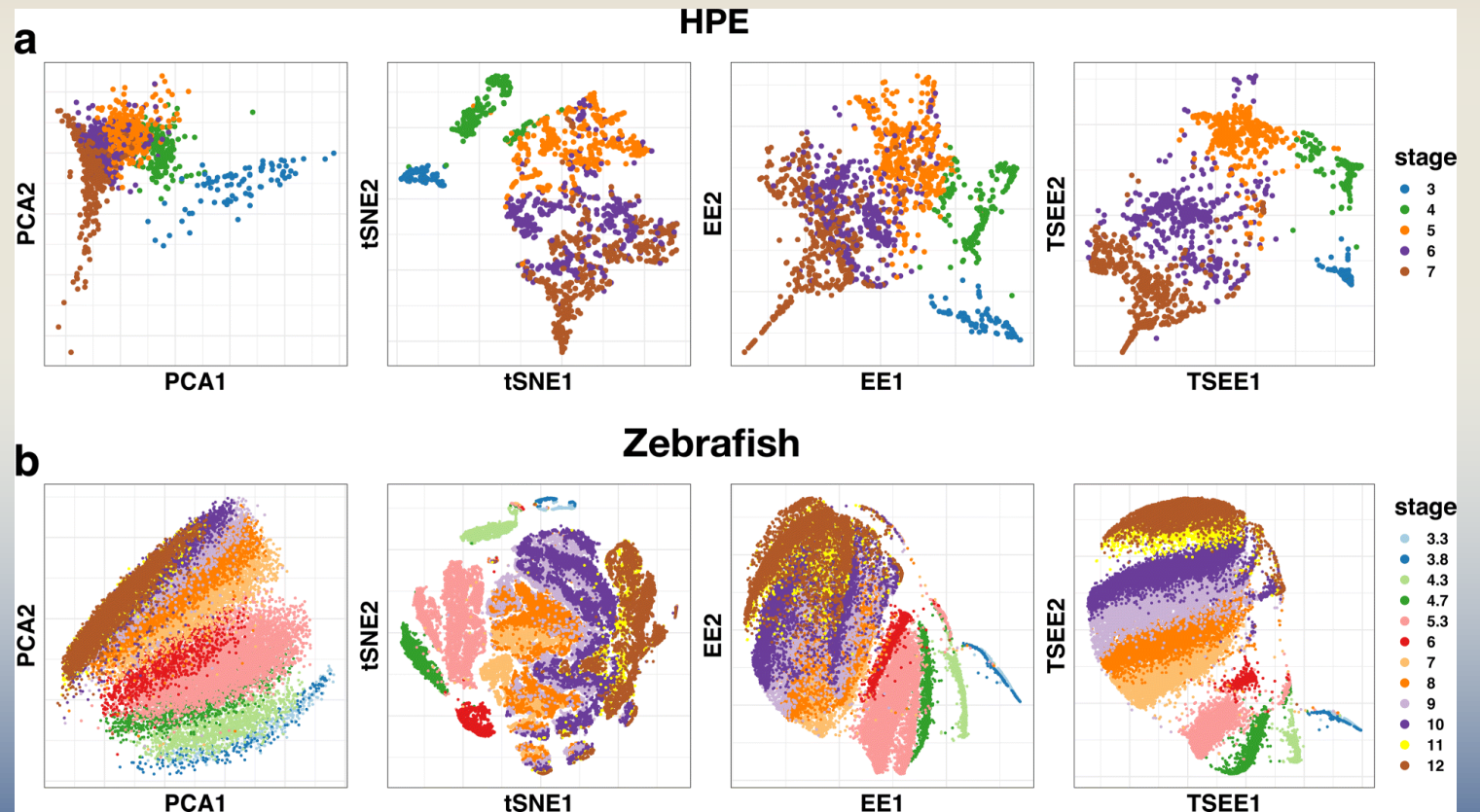
For example, Euler's formula is recognised as the most beautiful formula, so what are his methods of visualisation? What can be attempted from the standpoint of artistic creation?

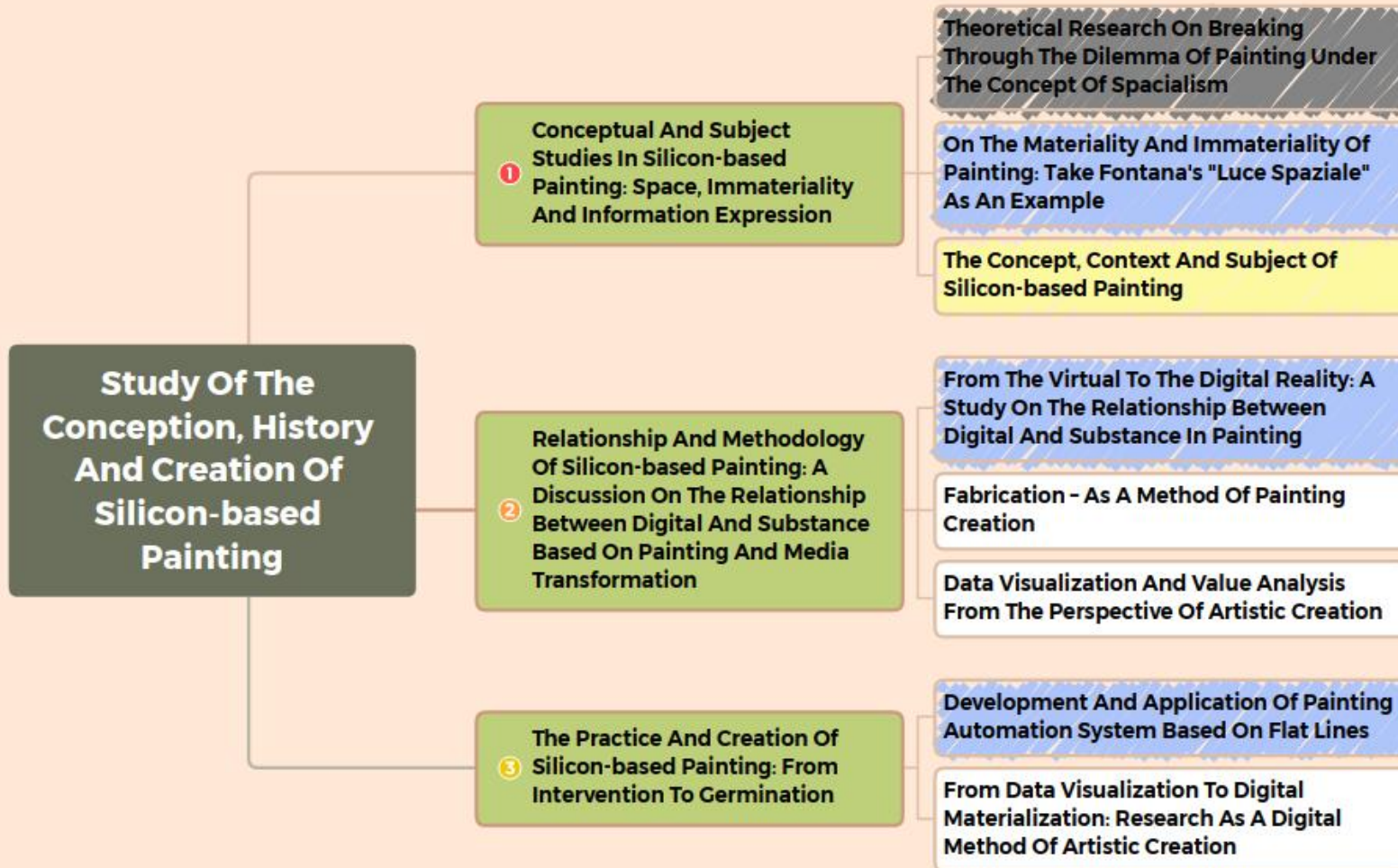


The Practice and Creation of Silicon-based Painting: From Intervention to Germination

- From data visualization to digital materialization: research as a digital method of artistic creation

According to the artistic logic of fabrication, I can also achieve visual modeling by fabricate data.





Presented with xmind

The above is the content framework of my PhD research, and my current research progress is as follows: the gray area represents the research I have completed, the blue area represents the content to be completed or expected to be completed in the near future, and I am not sure about the content of the color changing area, especially in the aspect of literature review, the white area still needs some preparation.