

# Psychedelic Forms: Ceramics and Physical Form in Conversation with Deep Learning

VARVARA GULJAJEVA \*, Computational Media and Arts, Hong Kong University of Science and Technology (Guangzhou), China

MAR CANET SOLA \*, Baltic Film, Media and Arts School, Tallinn University , Estonia



Fig. 1. Final result. Ceramic sculptures Psychedelic Forms by Varvara Mar. From left to right: Psychedelic Angel (Venus), Mermaid in green jelly and pink feather (Nymph), Psychedelic Angel (Venus)

Psychedelic forms is a series of case studies that explore deep learning (DL) possibilities for creating a tangible form guided by text prompt and 3D object. The selected generated digital 3D objects were manually altered and prepared for 3D printing in ceramics. Glazing happened by hand, often inspired by the AI-generated objects' vertex colors. And the poring technique used for painting, it is a metaphor of the thermodynamics of meaning spaces in the latent spaces.

\*Both authors contributed equally

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Psychedelic refers to unexpected or unexplored imagination that the human eye has not seen before. Although the original input was well-known ancient sculptures, like Venus, the AI model was capable of stylizing the mesh with the inputted text prompt in such a way that the new form was hardly recognizable.

The artwork demonstrates embodied experience and transformation of DL model through artistic practice. To be more precise, by introducing clay as physical material to the process, the destruction and alternation of form happened. Interplay of digital, and physical and chemical processes created new meanings and experiences. We see it as a meaningful and tangible way of latent space navigation.

As a result, the neuro-avant-grande mixed with artisan techniques and processes offered irregular transformations that contribute to creativity and imagination augmentation. In other words, irregular mutations can lead to new creations that would not happen otherwise.

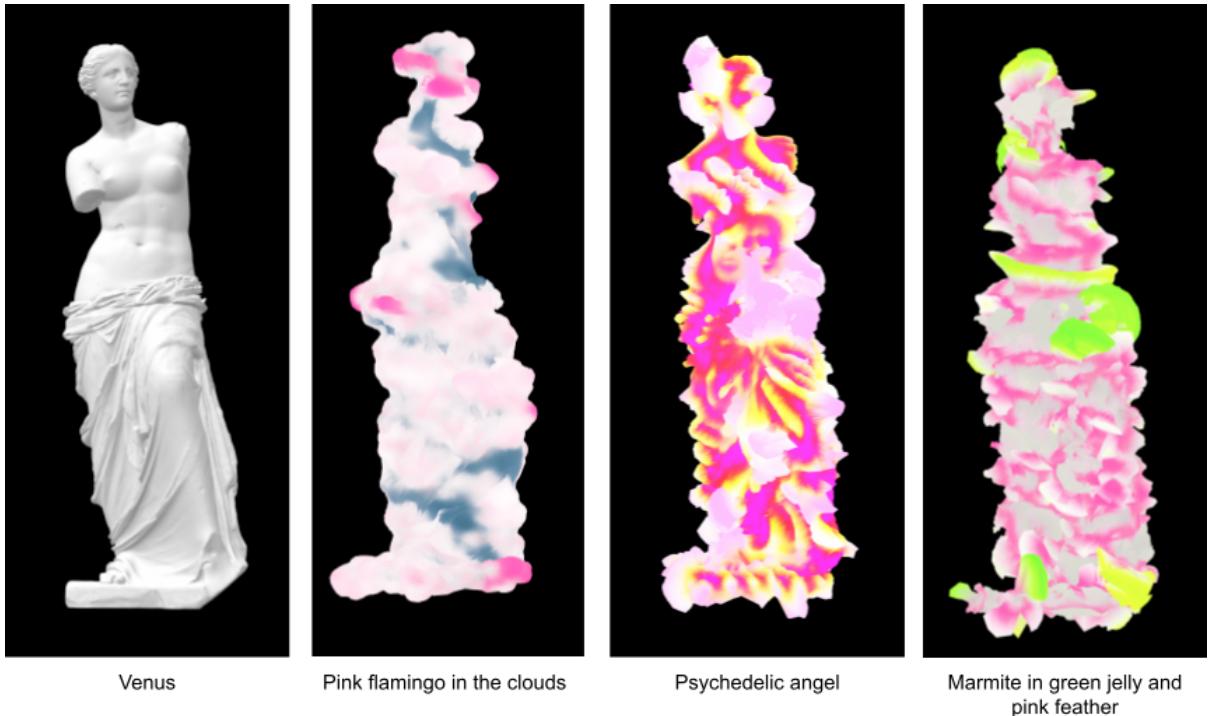


Fig. 2. Figure 1. Examples of Text2Mesh outputs with the same object and different text prompts

CCS Concepts: • **Applied computing → Media arts;** • **Computing methodologies → Artificial intelligence.**

Additional Key Words and Phrases: ceramics, hybrid practice, neural networks, tangible AI, co-creative AI, sculpture, text2mesh

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## 1 INTRODUCTION AND CONCEPTUAL FRAMEWORK

Like in the other disciplines, AI, especially DL, has triggered enormous interest in art. Artists explore new meanings and possibilities of this technology through their practice. Many image-, sound-, and text-based works

with AI models, such as GAN and GPT, have been done. For example, the most known art pieces would be Mosaic Virus (2019) by Anna Ridler<sup>1</sup> and Memories of Passersby I (2018) by Mario Klingemann<sup>2</sup>. Interactive artworks that would demonstrate the translation of semiotic spaces are quite a few, though. For example, Dream Painter is one art project that translates spoken words into a robotic drawing [1]. This talks about the early stage of a novel DL model, which makes embodied experience, such as interactive artworks, and tangible object production complicated.

For example, Dio (2018) by Ben Snellh<sup>3</sup> artwork aims to extend flat results from GAN models into 3D physical space by producing sculptures from the shredded computer used to produce GAN images of this exact sculpture. Unfortunately, the author does not elaborate further on the production processes behind it. The artwork Metamultimouse (2022) by Matthew Plummer-Fernández<sup>4</sup> is a digital and physical figurine that is 3D modeling and had used a GAN to generate the texture applied to the shape. The artwork sold as 100 edition NFT has two materialities, one as a video animation of the figurine and a second as a digital color printed sculpture, different in each edition using one of the frames of the video. The pieces are printed in Nylon using HP's Multi Jet Fusion (MJF) technology, which supports very complex geometries and full colors. This double materiality of the piece is a common feature with the project presented.

Psychedelic Forms is an art project that was inspired by classical sculptures, an ancient way of producing ceramics and the limitations of DL models when it came to tangible object production. Seeing how limited to 2D we are when working with GAN models, we started to experiment with how we would archive a tangible object from the neural net. By using a 3D object and text prompt, we guided AI model that stylized the mesh. Later, the model was altered and prepared for 3D printing in ceramics. The complex form emerged because of the co-creation between human and AI, and interplay with material and production processes. The hybrid processes that combine digital, physical, chemical and ancient craft worlds are embedded into this project and described below.

We believe that the conceptual and experimental properties of the project help to connect the dots between new technologies and ancient production methods. The project demonstrates the artistic exploration of latent space and its translation to material, color and shape.



Fig. 3. Producing sculptures from clay and manual glazing process

<sup>1</sup><http://annaridler.com/mosaic-virus>

<sup>2</sup><https://underdestruction.com/2018/12/29/memories-of-passersby-i/>

<sup>3</sup><http://bensnell.io/inheritance-ii>

<sup>4</sup><https://feralfile.com/artworks/metamultimouse-wzq?fromExhibition=doppelganger-jgz>



Fig. 4. Final result. Ceramic sculptures Psychedelic Forms by Varvara Mar. From left to right: A Snake resting on my breast (MilfordLane), Snake and Angel on Blue Moon (Dionysus)

## 2 PROCESS

In recent years, there have been many new research projects in the field of 3D deep learning, creating new ways to generate 3D models [5],[4]. More recently, another category of research projects is the one that deals with 3D models guided by text input that involves mesh deformation and/or texture creation [3] [2]. This technique allows a new way to modify a 3D mesh with a text input, which is quite different from the usual way of 3D modeling. When it comes to object manipulation with a concept, we managed to successfully deploy the Text2Mesh model. Text2Mesh is an AI model that stylizes object mesh based on text input using CLIP, which is very similar to what CLIP can do in image models but at 3D level. [3] Here it is important to note that the model does not create a new object but modifies the existing mesh.

Psychedelic forms is a series of experiments generating 3D forms with an AI model using text input. To be more precise, Text2Mesh model does not generate an object from scratch but deconstructs an existing mesh, based on the concept. In the words of the model's developers, it is called neural stylization of the model. Hence, we fed to the algorithm several ancient Greek sculptures' models: Venus, Nymph, and Double-herm; and molded them with the words. The results on a screen were aesthetically very pleasant and enchanting but from the 3D printing point of view a disaster. Thus, lots of manual reparation work in the 3D modeling program was required.

As we know, DL is known for the vast amount of content generation with its style and aesthetic, which feels repetitive in the long run. However, it is impossible to achieve exact repetition from the same input. In the case of this study, the repetition was further destroyed or made impossible by adding material and physical forces into the quotation.

The project demonstrates a translation of semiotic spaces, in this case from text-to-mesh, that contributes towards creativity augmentation. In other words, the irregular mutations can lead to new creations that would

not happen otherwise. In addition to the mutations within a system, there was an additional transformation that was introduced by the 3D printing process. bodily experience of material and form during production process.

## 2.1 Biographies:

Dr Varvara Guljajeva is an Assistant Professor in Computational Media and Arts at the Hong Kong University of Science and Technology (Guangzhou). Previously, she held positions at the Estonian Academy of Arts and Elisava Design School in Barcelona. Her PhD thesis “From Interaction to Post-Participation: The Disappearing Role of the Active Participant” was selected as the highest-ranking abstracts by Leonardo Labs in 2020. As an artist, she works together with Mar Canet forming an artist duo Varvara Mar. Often the duo’s work is inspired by the information age. Their works were shown at MAD, Barbican, Ars Electronica, ZKM, etc.

Mar Canet Sola is a PhD candidate and research fellow at Cudan research group in BFM Tallinn University. He has a master’s degree from Interface Cultures at the University of Art and Design Linz and two degrees in art and design from ESDI in Barcelona and in computer game development from University Central Lancashire in the UK. As an artist, she works together with Varvara Guljajeva forming an artist duo Varvara Mar. Often the duo’s work is inspired by the information age. Their works were shown at MAD, Barbican, Ars Electronica, ZKM, etc.

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<sup>5</sup><https://espacioopen.com/>