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**'The Faces of the Circle'**

**Three-dimensional print as a medium.**

**The meaning of work of art in virtual and real aspect.**

Abstract of a doctoral dissertation in the field of visual arts  
in the discipline of fine arts.

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The descriptive part of the doctoral thesis is a reflection upon additive manufacturing technologies in the context of artistic activities. This relatively new phenomenon has attracted many enthusiasts and gained widespread popularity in the last decade, while running into some controversy (e.g. the prospect of producing firearms). However, the road from the niche, through the fashionable yet controversial to mundane characterizes each new technology. Less than eight years following the completion of the first 3D printer based on the RepRap Mendel model in Poland, the author attempts to analyse the phenomenon with regard to its usage and involvement in artistic creation, with particular emphasis on the relation between the virtual digital model and its physical realization.

The first and the second chapter of the dissertation outline the historical background of additive technologies and their role in the beginnings of the work of international artists. Their particular attachment to faithfully reproducing the object in accordance with its prototype, associated with the archetype of the classical mimesis principle, was the key criterion in the selection of the artists. The second criterion involves the interpenetration and mutual influence of the digital plane, reserved for the project phase, and the physical plane which ultimately shapes the reception of the work. It serves to provide a more comprehensive analysis of the applied technology as a creative process significantly affecting the formal aspect.

The second part of this dissertation attempts to outline a new way of thinking about additive technology as a creative method. In the third chapter, based on the structural methodology of analysis proposed by Rudolf Arnheim and Wassily Kandinsky, a new view on the relationship between the *virtualis* of the digital model and its physical representation has been proposed. On the philosophical and aesthetic level, the main and recurring problem that sets the tone for this study is the Platonic relationship between the world of ideas and its reflection in the world of things. A relationship that raises a number of questions about the nature of an object derived from the computer environment, passing through an automated process, up to the final entity whose identity demonstrates the utopian nature of black and white technological assumptions.

The complete artistic part of the doctoral dissertation titled 'The Faces of the Circle', which became the subject of description and analysis in the third chapter, is an attempt at examining spatial printing as an artistic medium, based on the dialogue between digital virtuality and reality. By rejecting the imperative of the *mimesis* principle the author has accepted all phenomena accompanying the process of object creation, such as mishap or error, as equal causal factors. The observed phenomena allowed for appreciation of the artistic value of the created objects. Thus, the completed project becomes a pretext for proposing that the seemingly automatic and soulless process of realizing a digital model using FDM technology may be a source of objects of artistic qualities. It may also be proposed that, in the long term, additive technologies might potentially be regarded as an equally valid processes of creating spatial forms.