

Print a thing! Analysis of the aesthetic meaning of 3D printing with emphasis on how artists, designers and architects currently use 3D-printers

Idea and research contribution

The rapid development of 3D printers designed for the mass market is at the moment being described by economists as the 'third industrial revolution'. However, amidst the technology excitement there is a lack of knowledge about what we print and what kind of aesthetic issues are associated with this particular access to translate two-dimensional images into three-dimensional objects.

This project examines how professional artists and designers are currently using the media and how the printed objects can be perceived aesthetically. The working hypothesis of the project is that the study must be approached from three angles:

- 3D prints as an expression of *unsettled imagery* between multiple dimensions
- 3D prints as a *liberation of the production of things*
- 3D prints as *tactile knowledge*

The project has a clear interdisciplinary dimension because it juxtaposes artists', designers' and architects' different use of 3D prints, and examines these creative profession's perceptions of two- and three-dimensional images. The project will establish a network of knowledge between researchers, educators and artists at Danish universities, architecture, design and art schools around the importance and potential of 3D prints.

Theoretically, the project will contribute critically to the discussions in three main fields: the visual culture's image theory (Mitchell 1986/1994/2005; Barck et al 2009), the concepts of media theory (Stiegler 2008; Mitchell & Hansen 2010) and its differentiation work (Elleström 2010) as well as aesthetic theory arguing for a broad concept of aesthetics that is able also to characterize the aesthetic outside the art, for example in design and other parts of our shaped world (Welsch 1990, 1997; Kyndrup 2008 a + b).

The project's research contribution will particularly be an analytical and methodological development in terms of how artists, designers and architects use a specific

medium (the 3D printer), and how they and others can interpret and use the three-dimensional images, the medium produces.

INTRODUCTION TO RESEARCH QUESTIONS

3D Revolution

Where the Industrial Revolution in the late 1700s enabled the mass production of goods, and thereby creating an economy and a society in a whole new scale, the 3D printer does the opposite. With a 3D printer it is in principle just as cheap to make one copy of an object as it is to produce 1,000. Car and pharmaceutical industries have used the medium for prototypes for decades. What is new is that 3D printers are currently becoming so cheap that they can potentially be found in every home (The Economist; Mota; www.makerbot.com).

A 3D printer works like this: the user creates a digital model on her computer, or downloads it from the web (e.g. www.thingiverse.com), and presses print. The connected 3D printer builds the object up either by depositing material from a nozzle or by gluing thin layer of plastic or metal powders together. The technology is additive – the desired object is built up layer by layer.

The aesthetic and creative potential of 3D prints

In Denmark, in particular the sculptors Martin Erik Andersen and René Schmidt have worked with 3D printing as a special visual artistic expression. Martin Erik Andersen (www.martinerikandersen.dk) has used it in several projects and in his capacity as professor at the Royal Danish Academy of Fine Arts. He has e.g. made 3D scans and prints of his own body. He seems, indeed, to exploit what could be called the 'unsettled imagery', which the 3D printer's interpretation of the two-dimensional digital image information creates. It's not about the technique not being good enough or the artist performing inadequate, but that he uses the medium to let us sense a sort of hesitation in letting things into the world. In 3D prints the two-and three-dimensional image can be embedded into each other in a way that seems to cancel our usual notions of surfaces and spaciousness. As if there has not been taken a final decision about the spatial character of the printed image – it is so to speak 'unsettled'.

For René Schmidt (www.3deconomy.dk) the 3D printer is very much a democratic tool, which will ultimately allow free access to the means of production (Ross: 89). The question is whether we will know what we want, if nobody needs to have the same things anymore. Schmidt's approach to the medium thereby also focuses on what type of user – and thus citizen – the 3D printer helps to develop. This points toward B. Stiegler's theories about how media and technologies fundamentally change the role of people in the world, are we subjects or objects of technology, agents or patients?

Other users of 3D printing (including mathematicians, designers and techies) use the machine as a new way to achieve tactile knowledge. You can create geometries and shapes digitally and get a printout of them, providing a more immediate sensation and, according to some, deeper insight than is possible to achieve only through words and images, because it is about forms that no one has experienced before (Sequin: 66). This is a perspective view of the 3D printing, which is substantially in the art as well as learning and innovation contexts. This is also underlined by the contacts I have taken to the Danish architect and design schools and Aarhus University's education for Digital Design. There is a great awareness that the proliferation of 3D printing will give us crucial new understanding of 'things' and the aesthetic experiences of things – and affect our way of thinking creative processes and design in general.

Research questions

The project's research question is: What analytical parameters are particularly relevant to develop to comprehend 3D prints aesthetic importance and what kind of inter- and extra-disciplinary relations characterize designers', artists' and architects' current use of 3D printers? The working hypothesis of the project is that all three angles outlined above must be activated in order to answer the question: 3D prints as 'unsettled imagery' between several dimensions, 3D prints as a liberation of the production of things and 3D prints as tactile knowledge.

THEORY AND METHOD - ANALYTICAL PERSPECTIVES

The project's research material will partly be different disciplines' 3D prints (art, design, architecture and perspective industrial products) and these disciplines' own understanding

of printed objects and the process of creating them in the form of texts and qualitative interviews (Kvale 2009). The latter should help to clarify and expand, not delineate an interdisciplinary understanding of 3D prints aesthetic significance. The project will thus contribute to the understanding and concretisation of a broad concept of aesthetics that is able to characterize the aesthetic outside the art, i.e. also in design and other parts of our shaped world, including by characterizing the relationship between things / object / sculpture (Brown 2004).

The project's main theoretical and analytical contribution will be to identify and establish, but also to critically analyse the relationship between image analysis and media theoretical levels in the use and understanding of a specific medium (3D printer) and the three-dimensional images, it produces. The term "image" is used here in the tradition from 'Visual Culture Studies' as something that bears a resemblance, a design or a form, an image is not necessarily the opposite of an object, but something that appears and is always historically and discursively funded (Mitchell 1986; 1994; 2005).

When you want to understand the relationship between the 3D printer's two-dimensional input and three-dimensional product, it is a tenet of the project, that sculpture theory is particularly relevant, as sculpture must be understood as a medium between physicality and image (Winter 2006a + b; Barck m fl. 2009). As I pointed out in my doctoral dissertation, there has been a strong tendency in sculpture research to overlook that sculptures also must be interpreted as images (Jakobsen 2011). By focusing on the relationship between the 3D prints as images and the mediality of the 3D printer the project also contributes also to a discussion of media history: How does the new (digital) media effect our understanding of older media and vice versa (Jenkins 2006; Grau 2007; Krauss 1999 2010, 2011, Alt 2011).

Mediality is a key term in contemporary media theory and is an expression of how a specific medium, such as a 3D printer, is a medium. [important here to discuss the 3D printer as medium versus technology]. Another important concept is intermediality. That is, the understanding that media are largely characterized by the way they connect with other media, rather than how they differ from each other (Mitchell & Hansen, 2010; Elleström 2010; Bruhn 2010b; Mitchell 2007). The project will in this context, particularly investigate how

the 3D prints can be seen as copies of 2D data. The question of original versus copy is both a classic problem for contemporary visual art (Benjamin) and for the history of sculpture in particular (Hughes & Ranfft 1997). The 3D printer re-actualizes this problem in a specific manner, because the medium not only *mediates* the two-and three-dimensional and the digital and analog expression of an image, but embeds these levels in what I have called an ‘unsettled imagery’.

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Hjemmesider:

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