

EXPERIMENTAL USE OF DIGITAL MEDIA WITHIN THE FIELD OF CERAMICS

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ABSTRACT

This paper reflects an ongoing Ph.D. project about experimental use of digital media within the field of ceramics and refers to the theme about design boundary in the conference; in this case between traditional techniques in the field of ceramics and the use of digital media.

The paper presents an example of own experimental design practice, about how digital media can be integrated in a way that takes advantage of the approach a ceramic artist has to designing, and in a way which produce synergy in the interaction between the use of digital media and traditional techniques with natural materials. The paper discusses what this interaction can add in an artistic qualitative sense in a ceramic product and emphasizes a potential for the digital media to create fictitious narratives about the ceramic material in which it is embodied. Furthermore synergy emerged from a fluid boundary between fiction and reality, which reflects the above-mentioned use of techniques and materials, is emphasized. The focus in the field of ceramics is motivated by the author's background as a ceramic artist, but the project is about a general issue about integration of digital media in related fields such as textile and furniture design. These fields are characterized by a long tradition of craftsmanship using material and craft with great importance for both the process of designing and the finished product.

Keywords: digital media and analogue techniques, fiction and reality, Rapid Prototyping and 3d form.

1 INTRODUCTION

This paper reflects an ongoing Ph.D. project about experimental use of digital media within the field of ceramics and refers to the theme about design boundary in the conference; in this case between traditional techniques in the field of ceramic and the use of digital media. The Ph.D. project comprises the author's experimental practice and the paper is presenting one of these experiments.

My overall research question regarding the issue is how the digital media can be integrated in a way that takes advantage of the approach a ceramic artist has to designing and in a way which can produce synergy in the interaction between the digital media and traditional techniques with natural materials. And by that, what the use of digital media can add in an artistic qualitative sense to a product of ceramics.

The project focuses on 3d design; more specifically 3d digital graphics and Rapid Prototyping (RP). RP is a common term for techniques to transform 3d digital form into 3d physical form.

Since the technique in RP is not developed to a satisfactory degree to transform the digital form to the ceramic material, this project focuses on the RP-produced models used in combination with traditional techniques. Furthermore the study is focussing on the stage of sketching, - more precisely the stage when form appears as physical form. In that sense the project does not operate with practical functional solutions.

Regarding this research question a lot of experimental work has already been done by artists and researchers. An example of such an artist is Geoffrey Mann (<http://www.mrmann.co.uk>). Using video recording, he has built up a 3d digital form capturing the movement of a bird over time. Still pictures of the silhouette of the bird have been used as templates for the extrusion of a 3d digital form. The artefact in figure 0 is the result of the transformation of the 3d digital form into a physical form of glass. This has been realized with the help of Rapid Prototyping (SLS technique).



Figure 0



Figure 1

An example of researchers relevant to the issue under consideration is the research cluster at Falmouth College University “Automatic” (<http://www.autonomic.org.uk/>), which among others includes Katie Bunnell, Justin Marshal, Drummond Masterton and Tavs Jørgensen. The creation of the artefact, which can be seen in Figure 1, will form the basis of this paper and is a result of my own ongoing process of experimentation and reflections on the possible interaction between digital and analogue techniques and materials. The artefact is made of porcelain and the size is 40x30x12 (h) cm. It has a significant, organic growing and detailed formation in the middle and is limited by a soft curved edge, which is determined by the liquid material from which it is produced. In the following I will introduce my method of research, after that I will present my experiment and in the end I will discuss and conclude.

2 METHOD OF RESEARCH

In the case of my approach to research it is relevant to use the term “research through design” (Frayling 1993), which for our purpose can be defined as an experimental design practice that is part of the design research and contributes empirical data. The method is explorative and experimental, which in this study means that the research questions and empirical series of experiments are produced and developed in the process of research. This approach can be seen as a “reflection in practice” similar to Schön’s ideas (Schön 1983). The method begins with a definition of a frame for carrying out experiments, which is inspired by Exemplary Design Research (Binder and Redström 2006).

Quotation: With the notion of “exemplary design research driven by programs, experiments and interventions”, we refer to research based on the explicit formulation of design programs that act as a frame and foundation for carrying out series of design experiments and interventions. It is ‘exemplary’ in the sense that it enables critical dissemination primarily by creating examples of what could be done and how, i.e. examples that both express the possibilities of the design program as well as more general suggestions about a (change to) design practice. (Binder and Redström 2006).

My intention with this paper is to give an insight into one of these experiments in this frame and the potential it may exhibit. It is only relevant to talk about an insight, because the number of examples in this paper is not representative for the overall research question.

3 THE EXPERIMENT

The experiment has its starting point in the use of the 3d animation software called Real Flow, by which I have produced the data for a 3d RP produced digital model. The 3d model has formed the link for interaction between the digital media and the traditional techniques in the field of ceramics. In this case the use of slip casting with porcelain.

1.1 Digital Media

Regarding the issue I have explored the use of Dynamics in 3d digital graphic software packages as a design tool. Dynamics cover a range of tools in 3d digital graphic software to simulate transient phenomena and effects related to reality such as wind, gravity, liquids etc. Instead of capturing transient phenomena from the physical world, Dynamics allows you to simulate the transient phenomena

in question, making it possible to work with representations of them. In that sense it is suitable for exploration, since these 3d geometries in such software have the ability to respond if exposed to a force. Dynamics are found in large software packages such as 3d studio max and Cinema 4D, but can also be found in smaller and more targeted packages like Real Flow, which is used in this case. Real Flow is animation based software; hence it is based on film sequences. A fascinating point is that it is also possible to have these effects - such as a collided water surface, which delivers a water splash – produced as a 3D physical model by the use of Rapid Prototyping. In this case with a three-dimensional print in ABS plastic produced by a 3D printer from Stratasys Dimension. Figure 2 shows some snapshots from the animation used in this case. Using Real Flow it is even possible to be beyond gravity, specific gravity and the liquid surface. It is possible to regulate the speed and outcome of the event, which can then be an impact in a cup of coffee or in a liquid acid-sea on Venus. We are not bound by the laws of physics and can even freeze a moment in the film sequence at any time and the resulting model can be enlarged or reduced.

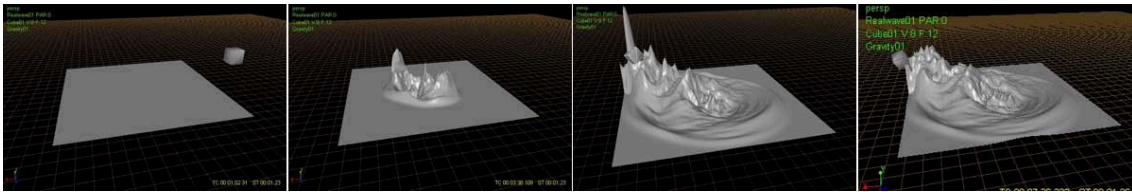


Figure 2

Figure 3 shows the physical model of a snapshot in the sequence produced by the 3D printer from Stratasys Dimension.

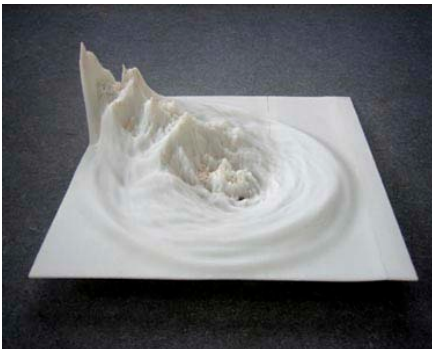


Figure 3



Figure 4

1.2 The artefact is created

The artefact in figure 1 was finally produced by slip casting in porcelain, which involves liquid aqueous clay. The liquid porcelain is poured onto a plaster mould made on the basis of the RP model. As the liquid material flows across the plaster, the water is drained out of the porcelain, whereby it slowly stiffens in its action and dries. The dry porcelain can subsequently be dismantled from the plaster mould, which now has made an imprint in the porcelain. The plaster mould used in this case can be seen in figure 4. It shows the imprint of the three-dimensional print in figure 3. First the depression was filled. Subsequently the liquid has found its way beyond the depression and at a stage is has been captured in a drying moment. The way the porcelain has been flowing is unique and determined by the way I poured it. This process is clearly reflected in the contours of the artefact, as a consequence of what *actually happened in reality*. By contrast, the irregular formation in the middle of the artefact was made by a digital simulation mimicking a liquid, which is hit by an object. The event has been frozen at the exact moment where the reaction of the collision has reached its climax. The formation is not created as a caricature, but with an

intention to be a naturalistic representation of an event, - but one that *never happened in reality*. But what difference does it make if the event *actually happens in physical reality* or it is a simulation? The answer is to be found in the synergy that occurs between the digital media and the analogue techniques and materials in the field of ceramics.

1.3 Synergy

If we separately reflect on the formation and the contour of the artefact, respectively, we will find the expressions fundamentally different. The formation describes and pictures a phenomenon about liquid. It is naturalistic but fictitious. It has never been a floating liquid itself and refers to a phenomenon which differs from its own creation, similar to the notion of a figure, model etc. On the other hand, the contour of the artefact rather refers to itself and its creation. It simply just looks like what it is. It has never been the intention for it to be anything but the flowing porcelain, which has stiffened. Thus the two expressions differ and integrated in one and the same artefact they create ambiguity and visual dynamic conflicts, which I will go into details about.

Because the formation is an integral part of the artefact along with its contour it is at first sight interpreted as a splash generated by the original liquid porcelain and as part or result of the creation. But on closer inspection it becomes clear that the formation seen in this context reflects a splash at an entirely different scale. As if it was a meteorite impact in a big ocean. This difference in scale is emphasized by the organic complexity of the formation reflected in a naturalistic miniature with photographic accuracy. It produces what I call a "*conflict of scale*". In general a scale-conflict is easily achieved e.g. a juxtaposition of model cars in different scales. But what makes this particular conflict of scale interesting is the imitation of material as such in the formation. The imitation makes the scale-conflict hard to point out at first sight and only gives a hint about something wrong.

Another important aspect is the character of the formation which seems to be a frozen movement. This reminds the observer of the ability of photography to capture a moment. This also points to the fact, that the formation was not a part or result of the creation. The liquid material, from which the artefact is produced, would not stiffen that quickly in motion, but rather have a less dramatic and calmer nature, as can be seen at the contour of the artefact. This difference in behaviour in one and the same object produces what I call a "*conflict of material*". In this experiment it is a conflict between the fictitious digital material and the ceramic material.

These conflicts are intriguing. On one hand we have an undramatic narrative about the creation of the artefact expressed through the behaviour of the material in which it is created. On the other hand, we have the much more dramatic narrative; the naturalistic, but fictitious and dynamic story about liquid "told" by the formation. In the juxtaposition of the two narratives in one and the same object synergy is created. On one hand, the powerful and condensed expression in the fictive narrative becomes plausible and tangible, when used in the context of real physical materials and analogue techniques. On the other hand, the event expressed in the contour of the artefact has the possibility to be interpreted as part of the fictive narrative and become something else than a sign of the nature of the material itself. As observers of the artefact, we will alternate between fiction and reality, but also between representation and material as such. Synergy emerges from these fluid and tricky boundaries presented in one and the same artefact.

CONCLUSION

In this paper I have attempted to present an example of how digital media can be integrated in a way that takes advantage of the approach a ceramic artist has to designing and in a way which can produce synergy in the interaction between the digital media and traditional techniques (and natural materials). Furthermore, I have discussed what this interaction can add in an artistic qualitative sense to a product of ceramics. Regarding this issue I will emphasize the possibility for the digital media to paraphrase or to produce a fictitious narrative about the material in which it is embodied. Furthermore the fluid boundary between the artistic expression through the material itself and the representation of phenomena in a different material should be emphasized. This is setting the stage for further reflection and discussion about the potential on fluid boundaries and further similar experiments in the meeting between clay and digital media.

The “hands on” explorative use of the digital media has raised some new issues to explore. E.g. regarding the use of the software Real Flow I find a lack of interaction between the user and the dynamics. The event simulation is defined in advance with the possibility to change parameters and orientation, but with no possibility for interaction by the user while the simulation is executed. This differs considerably from the approach of the ceramist relevant in this research, which I have mentioned earlier, and appeals more to a calculated and rational approach. Regarding the use of the RP produced 3d model within the traditional techniques for slip casting, I find some limitations in how complex the 3d model can be, if it is to be transformed into the ceramic material. These the photographs and issues call for further research which, I am sure, will show further potentials in an artistic qualitative sense.

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