Light liquid: a holographic ‘lake’ installed on the roof of an architect’s model townscape.

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Abstract. There has been considerable speculation about the use of holography in architecture and interior design over the past 20 years, with some spectacular examples having been realised. A number of installed works are referenced which use interior and exterior structures and spaces. Scale is considered as well as the possibility of architectural works existing within an artificial (model) environment. The visual, conceptual and critical values such an installation provokes are interrogated, with particular reference to ‘Light Liquid, a holographic ‘lake’ installed within the 2011 Miniment[s] exhibition at Nottingham Trent University, UK. Aspects of miniature public art interventions, and whether they can have a critical validity within a contrived and artificial environment, are examined.

1. Expectation of greatness

Since the first public awareness of holography in the 1960’s [1] there has been an anticipation of greatness. Popular media coverage of holography has raised expectations and blockbuster survey exhibitions of holographic images have not only proved to be extremely engaging, but appear to have raised those expectations even more. The field has seen a steady raise in interest during the 1970’s and 1980’s, with a dip during the 1990’s [2], yet in the past few years, if reaction in the UK is indicative, visitors to these exhibitions are still dreaming of possibilities [3].

Ten years ago I raised the question of whether “…the medium will ever live up to the expectations we place on it?” [4] and, although there have been some remarkable, and truly innovative, architectural and large-scale uses of holography by pioneering artists, designers and engineers [5], it is difficult to ascertain whether the use of holography in this field is anything more than post-design decoration.

Although my own work in holography has included installations which attempt to go beyond the small scale available on a gallery wall, architectural holography has never been an area I have felt capable of engaging with. This is partly because of the scale of equipment required – I prefer to work with pieces I can ‘pick up’, but also because the critical and conceptual compromises which need to be made when work is increased in scale have been problematic for me. There are very few opportunities
to truly experiment using large-scale elements. The financial and structural realities act as an inhibitor.

2. Tiny architectural monuments

One solution is to engage with issues of scale, expectation and contextualization in miniature and that opportunity presented itself in the Miniment[s] exhibition, which took place in the UK during April 2011 (figure 1).

Artists were invited to submit proposals to this innovative exhibition, which, rather than being installed in a traditional gallery setting, was mounted in an architect’s model townscape, located outside a gallery in the School of Art and Design at Nottingham Trent University. This transitory space within the school is used by students, staff and visitors from several departments, who walk through the same part of the building every day. One of the aspects of the exhibition was to include new additions of work to the townscape each week over the duration of the exhibition, so providing visitors with a durational series of interventions.

Figure 1. Installation view of Miniment[s] exhibition showing the entire model townscape installed at Nottingham Trent University, UK.

Not being in a gallery was a significant premise for this exploration of how monumental work might be conceived, developed and presented. From the open call for submissions, eight artists were selected to contribute a series of (mini) major artworks and interventions to the exhibition. [6]
Selection was made by a curatorial group of practising artists [7] who identified a variety of proposals including sculpture, found objects, sonic interventions and frozen paint. Each week a new tiny monument, or intervention, was installed to change the landscape of the ‘town’ by locating what are, in effect, monumental gestures within the miniature townscape. Over the course of the exhibition, the previous installation remained and each week a new piece was added to the expanding series of ‘public artworks’.

Exhibited works included: tiny posters promoting the Tag Group and each new artwork; a full-size cardboard radio whose aerial extended skywards and passed through the protective transparent roof of the display vitrine; a sonic installation permeating through the pavements of the town, an exploded church roof revealing interior blue sky; a designer lemon squeezer perfectly located above the town’s curved seating area; a holographic roof covering a building with the shadow of undulating liquid and, to close the exhibition, two buildings replaced with their exact volume of frozen white paint which, over the course of several hours, melted and enveloped the streets and their tiny inhabitants.

3. Light Liquid

‘Light Liquid’ (figure 2) is a holographic surface installed onto one of the flat-roofed buildings within the miniature townscape. A glass reflection hologram displaying the three-dimensional shadow of liquid was cut to the exact size of the building’s roof. Using a Denisyuk recording method and displayed pseudoscopically, these shadows, which are reminiscent of drawn marks, appeared just above the glass surface and therefore ‘hovered’ slightly over the top of the building.

![Figure 2. ‘Light Liquid’ 2011. Holographic intervention installed on model building’s roof.](image-url)
3.1. The kinetic effect

By recording information holographically, using a shallow amount of depth and then rotating the holographic plate around its horizontal axis, to display the image pseudoscopically, the information on display appears to exist just in front of the glass plate. This ‘space’ is the ‘property’ of the viewer – it is their space, the area they move around the work within. By presenting abstract marks in this location, a visual and perceptual ‘friction’ is generated. We ‘know’ that images cannot simply ‘float’ in space due to our engagement with physical objects in the real world. We also understand that shadows are ‘cast’ because of the path of light falling on an opaque object and that, subsequently, the shadow is always ‘connected’ to the object which cast it. By using this simple holographic recording technique, it is possible to visually disengage the shadow from its object, leaving it to exist in a different visual and conceptual volume (figure 3).

![Figure 3. Installation details showing ‘Light Liquid’ (foreground) in relationship to other townscape buildings and artist interventions.](image)

In this example, as visitors move around the townscape and view the holographic roof from a variety of angles, when the holographic information is visible (and at some points it simply appears as a gloss black covering), the shadow marks appear to be visually located ON the surface of the roof, not above it, and an enhanced kinetic movement takes place, causing the marks to drift and shift. This kinetic animation has been used by the author in a number of works, using reflection holograms, dating back to 1989. [8]
3.2. The model as legitimate object

It is certainly not unusual to test out proposals using models as a way of speculating how an intervention, in a full-scale environment, might function, and also as a visual indicator for prospective investors or planners. However, in this case, ‘Light Liquid’ was not a scaled proposal. It existed as a sculptural work, in its own right, within the miniature narrative generated by the model townscape and the curatorial premise of the exhibition.

If logic is applied to this holographic roof, it becomes ridiculous within a framework of real-world architectural structures. It is this breakdown in the reality of the situation which allows this installation to be observed and investigated using a fictitious narrative generated by the model environment. It is conceivably possible to actually construct this roof using sections of holographic material joined together to form a large surface area. There is a precedent in large-scale architectural structures by a number of artists who have successfully used this technique. [9] However, the result would inevitably be a mosaic of surfaces. ‘Light Liquid’ functions within the model narrative because it is a single sheet and because of the apparent expansiveness of its roof covering.

3.3. The monumental miniature narrative

If, as visitors to this exhibition, we place ourselves in the position of the townscape residents (and some of them were present during the entire month of the exhibition), from street level we would be completely unaware of the apparent ‘lake’ of undulating, three-dimensional liquid on top of the building. All that would be visible would be a consistent black line (the edge of the holographic plate) around the top of the roof. To view the holographically generated marks, residents would need to be at an observation point high above the town; a position occupied by the exhibition curator, visitor or fictional town deity. The roof intervention therefore functions on two distinct levels of engagement, one providing more visual access than the other. There is a parallel here to more traditional exhibitions where there is often a separation between how work is interpreted by the ‘expert’, the critic and the curious visitor. The situation also puts pressure on a visitor’s conceptual engagement with the work.

3.4. Concept beyond practice

The installation of this elevated holographic ‘lake’ has parallels to early work produced by artist Rick Silberman who, in 1982, engineered a massive installation using reflection holograms spanning the United States of America. In ‘Artifacts from Descartes’ Dreams’, Silberman traveled around North America, installing 8 x 10 inch reflection holograms within the landscape at pre-determined off-road locations which could be safely reached by motorcycle. Each contained a three-dimensional shadow of the image of a ‘wire’ stretched taught by a large tent hook. The shadow of a tether extended from the hook, out of the holographic plate, and into the space occupied by the viewer. Theoretically, this ‘line’ continues to extend outwards to infinity.

Each of the holograms which made up the installation was orientated so that at a certain time of day it would be possible for each of them to be illuminated by sunlight and activate their extended line to coincide at a high point over America. “The conceptual construct of the tethers rising and vanishing into space seemed as natural as a reflection off the surface of rippling water, or the after haze of a moist afternoon.” [10] Assuming there was someone, at a position high above America, to actually receive the light/image emitted from the holographic plates, would they actually ‘see’ this extended structure and would it be in three dimensions? This is possibly a redundant question, as the conceptual structure of the work takes precedent over the physical and optical reality. A narrative is created, which allows the work to exist in a framework beyond a designated gallery exhibition and offers a different platform for interrogation of the artist’s practice beyond its holographic ‘cleverness'.
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References and Footnotes
[1] Leith E and Upatnieks J June 1965 Photography by laser Scientific American vol 212 no 6
[2] Pepper A 2009 The definitive holography exhibitions list - filling the data gap - assessing a trend Proc 8th International Symposium on Display Holography, Shenzhen, China, p 65-70
[3] British collector and gallerist, Jonathan Ross, has toured survey exhibitions: Holograms, The first 60 years and Holograms 2, to major museums and exhibition venues through the UK which have each had high attendance from visitors who are ‘seeing’ holography for the first time.
[4] Pepper A 2002 Architectural holography: building with light, decorating with space, Royal Photographic Society Holography Group conference on Holography, Art and Design. Royal College of Art, London, UK. 23rd March
[5] Pepper A 2001 Building with light: holography, glass and architecture. This Side Up no 15 pp 2-4 ISSN 1389 1707, September
[6] Tag (Joseph Cerski and Bobby Sayer), Susie Cochrane, Rob Squirrel, Debra Swann, Gerard Williams, Andrew Pepper and Mark Lowe.
[7] Danica Maier, Geoff Litherland, Ben Judd, Craig Fisher and Terry Shave.
[8] Early work by the author to incorporate enhanced optical kinetic effects was produced as part of a PhD research initiative, Department of Fine Art, University of Reading, UK, during 1989
[9] Although not a definitive list, large-scale works produced by artists include: Rick Silberman, Artifacts from Descartes’ Dreams, 1982; Paula Dawson, There’s No Place Like Home, 1985; Sally Weber, Flight of Fish, 1990; Melissa Crenshaw, interior Canadian Pavilion Expo 1992; Shu-Min Lin, Glass Ceiling, 1996; Michael Bleyenberg, EyeFire/AugenFeuer, 2000; Dieter Jung, Perpetuum Mobile, 2001; Hiro Yamagata, Quantum Field-X3, 2004
[10] Silberman R Artifacts from Descartes’ Dreams, a continent-wide holographic journey and the largest holographic installation to date. Unpublished document supplied by the artist, 11 April 2012