A Magic Lantern Data Projector

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1. INTRODUCTION

The *Magic Lantern Data Projector* allows a performer-participant to build sculptural glass forms that are projected, then algorithmically processed. The device re-envisions magic lantern slides as transparent, multifaceted three-dimensional glass boxes. The projected image is a palimpsest of coloured transparent glass forms (Figure 1). Servomotors position the boxes in front of a camera lens, which uses software to translate the projection into numerical data.

2. AIMS

The *Magic Lantern Data Projector* aims to intertwine analogue and digital projections of data. It does so by enacting a creative alternative to conventional screen-based data display while engaging participant-performers in constructing sculptural forms with glass. The *Magic Lantern Data Projector* additionally aims to problematise how data can be created, collected, and interpreted. In doing so, it questions the "black box" nature of digital data through sculptural and performative modes. These augment the usually ambiguous process that data undergoes as it is acted upon in mysterious, seemingly magical ways by programming code's invisible operators.

3. BACKGROUND

This collaborative work expands the potential of interdisciplinary cooperation between digitally fabricated glass art and electronic art. It presents results that have been generated from studies of sculptural glass process and the performativity of code. The device extends from Mark Hursty's pressed glass PhD research where molten glass is poured into bespoke press-moulds made out of waterjet cut fusing glass. The glass boxes that resulted were discovered to transmit colourful light and shadows in detailed ways that inspired the use of analogue projection.

While data is now predominantly considered and viewed in digital ways, Sara Diamond emphasizes its fundamental analogue nature when she states, "Data can be numbers, words or images. Data can be collected manually (as it has been for centuries), and then put into a computer." (Diamond 2009, p. 40) Victoria Bradbury's PhD thesis links code and data to object and performance, stating, "Code performs actions upon data as it is run. This concept is reinforced when the historical origins of programming code in object are examined. Every utterance or running of language or code is unique and opens a possibility for response." (Bradbury 2015, p. 57) This definition of code's performativity is met by The *Magic Lantern Data Projector as* it combines sculptural object, performer-participant bodies, instructions for action, and programming code.

4. PERFORMING THE PROJECTOR

When engaging with the *Magic Lantern Data Projector,* performer-participants are temporarily removed from the process of creating data on their digital devices. In this moment they can reflect upon those unconscious processes by subjectively visualising shape, colour, and movement in hand-built glass structures. The transparent coloured segments overlap and are illuminated by a single beam of light. This projection is read in real time by a camera. Hue values of the predominant colours present in each frame are then processed by software, which generates numerical data.

5. CONCLUSIONS AND NEXT STEPS

The process of creating and performing the *Magic Lantern Data Projector* creates a cyclical mode of sculptural making with glass, analogue projection, programmatic process and physical computing.

This combination of techniques arose by performing a process of obfuscation and re-interpretation of data through collaborative means. The purpose of this is not only to present a new aesthetic for data portrayal, but also to offer new techniques to the fields of electronic art and glass art, as Hursty states, to "…extend the range of glass and electronic art collaboration in terms of content generation, rather than simply a design and manufacturing relationship" (Hursty 2014).

The next step for this collaboration is to engineer the motor driver software so that it positions the glass box in front of the camera lens to favour and frame certain areas of colour. These choices will be based upon dominant hue values. This is intended to reflect ways in which data sets can be skewed when interpreted based upon the subjective requirements of the operator. Additionally, new glass artworks can emerge from the camera's framing of the projection (Figure 3, bottom). These could arise by taking the built structures and fusing them together with the screenshots of the data as solid glass forms. This would lock the data into glass, which, unlike digital media, offers archival permanence.

6. REFERENCES

Bradbury, V. (2015) *The Performativity of Code in Participatory New Media Artworks*. PhD thesis. University of Sunderland, UK.

Diamond, S. (2009) *A tool for collaborative online dialogue CODEZEBRAOS*. PhD thesis. University of East London, UK.

Hursty, M. (2014) *Making 'Glass Road' Muqarna with Digital Road Process.* Proceedings of the 20th International Symposium on Electronic Art, ISEA.

Figure 1: *Projected glass slide box and data forms*

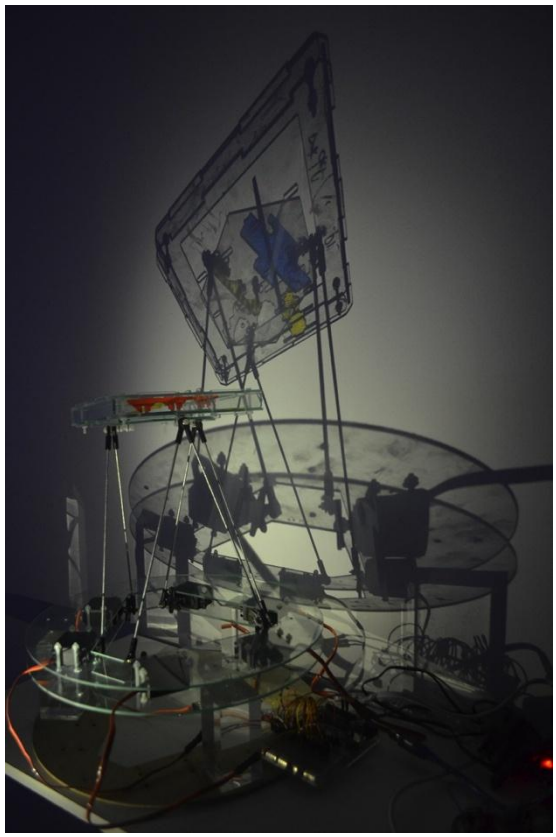

Figure 2: *Illuminated data projection apparatus consisting of a servo-motorised Stewart platform made of waterjet cut glass components*

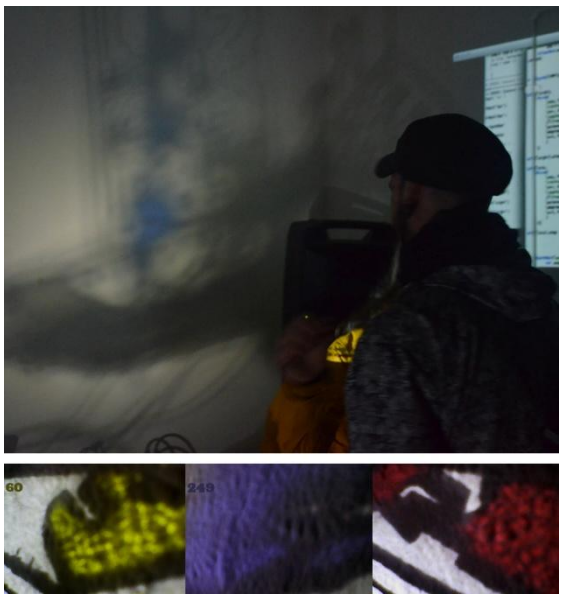

Figure 3: *Top: Installation view featuring projected coloured forms alongside computerised data display. Bottom: Image details of captured projected colours with numerical values*