Digital art at the Victoria & Albert: History, recent development & trends

Melanie Lenz

Patric Prince Curator of Digital Art, Word & Image Department,
Digital Programmes Manager, Learning Department,
Victoria and Albert Museum, m.lenz@vam.ac.uk

ABSTRACT: The V&A has a long history of engagement with digital creativity and has been collecting computer-generated artwork since 1969. Although computer art was largely ignored by the art establishment throughout the 1960s and 1970s, a small number of works by computer artists were acquired by the Museum. More recently, the V&A has sought to acquire a broad range of artworks that help to document the emergence of contemporary digital art and design. The paper traces the history of the V&A's digital art holdings and its collecting policies, reflecting on the changing terminology, curatorial approaches and challenges to the 'new' media. The article addresses the increasing visibility of digital art and design in the Museum, from exhibitions and loans, to being the focus of scholarly research; most recently on digital art, design and new technologies for health. The paper also highlights the V&A's dynamic digital learning programme to explore what role digital art plays in the Museum.

1. INTRODUCTION

The V&A is one of the world's leading museums of art and design. Its collection, spanning two thousand years of history, reminds us that technology has provided artists with new ways to express themselves for a very long time. That withstanding, the impact of the computer on the creative process and creative industries marks a culturally significant development whereby digital technologies have radically changed the way art is made and experienced. The V&A's holdings chart and illustrate some of these changes.

The Word and Image Department at the Museum has been acquiring digital art since the 1960s, but the core of its collection is formed of two donations; the archive of the Computer Arts Society, London, and the collection of Patric Prince, an American art historian. The acquisition and documentation of both donations has been the subject of extensive study and research, including Douglas Dodds's 2008 EVA paper 'Computer Art and Technocultures: evaluating the V & A's collections in the digital age'.

In 2008 the newly formed national collection of computer-generated art consisted of approximately 500 items. The V&A has continued to actively acquire works and, since the collection was first established, the number of digital artworks has more than doubled. The objects in it range from early experiments with analogue computers and mechanical devices, to examples of contemporary software-based practices that produce digital prints and computer-generated drawings. The holdings consists predominately of two-dimensional works on paper, such as plotter drawings, screen prints, inkjet prints, laser prints, photographs and artists' books. It also includes a small but growing number of born digital artworks.

2. ON GROWTH (AND FORM)

The title of the heading alludes to the increasing scale and scope of the collection and it also appropriates the name of an artwork by Daniel Brown acquired in 2014 (Figure 4). Brown, in turn, titled his art in homage to the book of the same name written by D'arcy Thompson in 1917. The following section considers the growth of the V&A's holdings, highlighting some of the significant acquisitions made in the last 5 years.

One of the strengths of the collection is its holdings of early computer-generated artwork. The additional acquisitions of rare and historical works have considerably enhanced the Museum's ability to document and preserve the histories of digital art. For example, in 2014 with the assistance of the Art Fund, the V&A purchased pioneering work by Frieder Nake. Born in 1938, in Stuttgart, Nake studied at the Technical University, where he developed a program that enabled him to control a Zuse Graphomat Z64 drawing machine. Influenced by the philosopher Max Bense, who developed a theory known as Information Aesthetics, Nake went on to be one of the first people (alongside Georg Nees and A. Michael Noll) to exhibit computer drawings as works of art. Nake showed his work at Wendelin Niedlich Gallery Stuttgart in November 1965. The works in the collection are some of the earliest drawings the artist made.

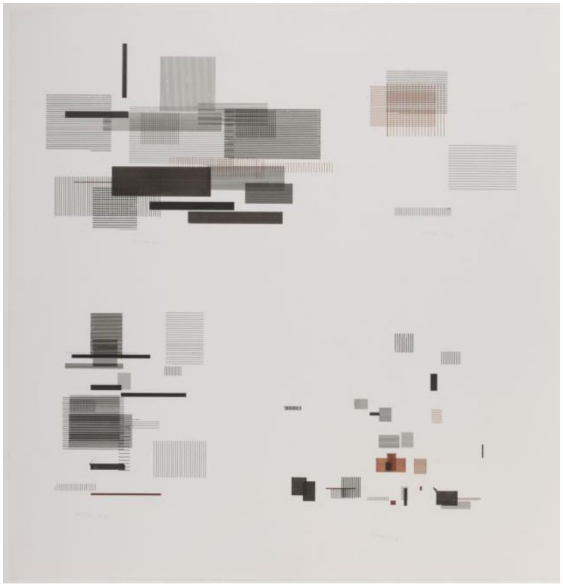

Figure 1: *Rechteck schraffuren 30/3/65 Nr.1-4 Frieder Nake, 1965(E.258-2014)*

By the late 1960s an increasing number of artists with traditional fine art training began to adopt the computer into their practice. Vera Molnar was one such artist, and one of the first women to use computer algorithms to produce her art. Whilst the V&A already held a few small later works by her, an important acquisition in 2011 ensured that her work was better represented in the collection. The acquisition included *Interruptions* (1969), one of a series of Molnar's earliest computer-generated images, *(Dés)Ordres* (1974) and *Structure of Squares* (1974) both of which illustrate her pared-down method of working in series.

Like Molnar, Manfred Mohr was already working in a systematic way that prefigured his use of the new digital technology. A number of his computer-generated prints were donated to the Museum by Patric Prince and the Computer Arts Society, complementing the works acquired by the Museum in the late 1970s. In 2011 a deck of his punched cards were also acquired for the collection. Created to process data, the cards were made in 1970 for *P-32 (Matrix Elements).* They were used as a program to instruct the computer to plot a set of random points above a horizontal line then connect them to form a continuous line. The V&A has always placed significant emphasis on process and technique alongside the finished product; it has actively collected technological developments such as printing tools and equipment, as well as documentary material to demonstrate work in progress. The acquisition of the punched cards is an example of this practice.

The digital art collection has grown as a result of newly acquired work made by fine trained artists hitherto not represented in the holdings. For example, the American hard-edge painter Frederick Hammersley who created a set of impact prints in 1969. Hammersley taught at the University of New Mexico and it was here that sculptor Charles Mattox introduced him to the engineer in charge of the university's new IBM mainframe computer. The possibility of image making facilitated by a computer captivated Hammersley's imagination and resulted in a series of over 72 drawings which he made using ART1, a program developed at the university's Department of Electrical Engineering and Computer Science.

The significance of UK universities as sites of early digital art production, and the opportunities afforded to students using the computer in art schools, is well documented by Mason (2008). The recent acquisition of artworks by Dominic Boreham, Darrell Viner and Stephen Scrivener offers researchers an insight into the specific experimental practices emanating out of the Slade's Experimental and Computing Department. Set up in 1973, the department adopted technology at a time when this was rare amongst other, more traditional, art schools and actively encouraged cross

disciplinary collaborations and the use of computers in art.

With the advent of personal computers becoming increasingly common and the arrival of off-the shelf-software, the 1980s witnessed a radical change in the nature of computer-generated art and design. Collecting works from this era remains an area of continued development for the V&A. One way the Museum has begun to address this is with the acquisition of early work by William Latham, whose practice encapsulates some of the technological and artistic developments of this time. In 2014 the Museum acquired a selection of Latham's work, from his evolutionary hand drawn systems using drawing rules in 1985, through to his transition of developing software and creating computer-generated images in 1987/8. Latham was appointed Research Fellow at IBM UK Scientific Centre in 1987, and together with Stephen Todd developed software to generate and mutate forms.

Figure 2: *Twister 1, William Latham, 1988 (E.295-2014)*

Latham's artist in resident status at IBM ensured his access to the mainframe computer. Similarly, a number of works in the digital art collection were produced as a result of artist residency programs including prints made by David Em. In 1977 he was Artist in Residence at NASA's Jet Propulsion Laboratory. The V&A continues to collect art created through residencies, for example in 2010 the work of Christian Kerrigan was acquired. Kerrigan was the V&A's first Resident Digital Artist. *Bloodlines 1.0*, seen in Figure 3, represents a hybrid landscape of real matter and virtual space, incorporating both artificial and natural elements. Kerrigan, who uses 3D scanning, computer software sculpting and chemical reactions, creates works that respond to their environments and change over time. His interest in living systems, behaviour, processes, patterns and forces of nature relate to ideas about artificial life; a theme explored by early digital pioneers already represented in the collection, such as Paul Brown.

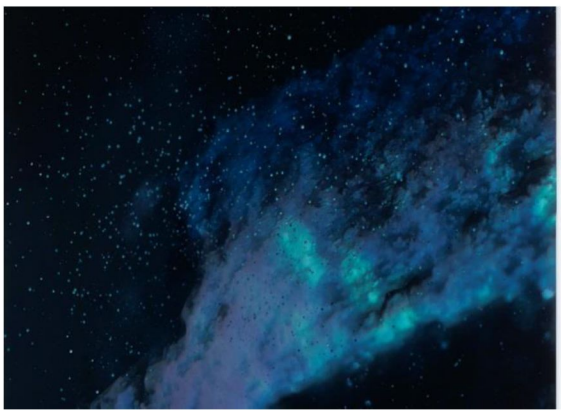

Figure 3: *Detail from Bloodlines 1.0, Christian Kerrigan, 2010 (E.1475-2011)*

The parallel preoccupations of contemporary artists and early pioneers can also be seen in the work of Harold Cohen and Patrick Tresset. In 2011 the Museum acquired a portrait drawn by Paul, a robotic installation developed by Tresset. The latter's practice seeks to emulate the act of drawing and explores the role of technology within the fine arts. It echoes the concern of earlier practitioner Harold Cohen who created AARON, a computer program that utilised artificial intelligence to generate artworks.

The number of contemporary digital artworks in the collection grew as a consequence of acquisitions made following the exhibition 'Decode: Digital Design Sensations' (2009-2010). These acquisitions included *Study for a Mirror* (2009-2010) a light sensitive interactive work by rAndom International; *Recode* (2009) an open source identity by Karsten Schmidt; *Flight Patterns* (2005-2009) a data visualization by Arron Koblin; and *On Growth and Form* (2009), a generative artwork by Daniel Brown (Figure 4). The acquisition of these born digital works represented new challenges for the Museum.

Figure 4: *On Growth and Form, Daniel Brown, 2009 (E.297-2014)*

3. ON DOCUMENTATION AND PRESERVATION

The terminology for technological art forms has for many years been a point of contention and a number of early artists rejected the term 'computer art'. Digital art, which itself is a nebulous term, has undergone several name changes and shifts in meaning. For much of its history, the art form has also occupied a somewhat precarious place in critical and art historical circles. Goodman (1990) suggested this reluctance emanated from the public's familiarization with commercial rather than fine art application of computers. She pointed to the reluctance of art dealers, suggesting it stemmed from the challenges of marketability, where the work can be reproduced over and over. As Grant (2014) notes, computer art had been stigmatised for its mechanistic and militaristic associations since the 1960s and viewed with scepticism by the mainstream art world. The Museum was not exempt from these apprehensions and official records reveal the curatorial concerns that surrounded the V&A's first acquisition of such material; a set of computer generated prints published in conjunction with 'Cybernetic Serendipity', the landmark exhibition held at London's Institute of Contemporary Arts in 1968. The acquisition files for the prints include a number of negative comments, such as "I am far from convinced about their aesthetic validity" or "they should be represented in the museum as characteristic aberrations". (V&A nominal file for the publisher, Motif Editions, MA/1/M2971 cited by Dodds 2015).

Conservation considerations also formed a factor in these curatorial reservations. In the case of early plotter drawings, the light sensitivity and thinness of the paper were concerns. Whilst attitudes about the place of digital art in the Museum have considerably changed, debate surrounded the conservation and preservation of such material remains a much discussed topic. The challenge of preserving work rests on the question of how born digital art can be understood and used in the future when systems, software, and knowledge continue to change. The vulnerability faced by all software-based artworks is its susceptibility to change. The obsolescence of hardware and format, the bespoke nature of the code and the rapidly changing systems and technical environment all pose risks. Yet, it is also often the process orientated, time based, dynamic, interactive, participatory, collaborative, customizable, modular, generative and variable aspects that are intrinsic to the work. In the paper, 'In Times of Change', the Museum's digital art preservation strategies are explored using, as case studies, the acquisition of *Process 18 (Software 3)* by Casey Reas, *Shaping Form 14/5/2007* by Ernest Edmonds and *Study for a Mirror* by rAndom International.

More recently the collection and its associated histories have been the focus of a conservation project called 'Play it Again SAM'. The research looked at the 1968 kinetic sculpture *SAM (Sound Activated Mobile)* by Edward Ihnatowicz, an early pioneer of computer-based cybernetic art. The research formed part of the initiative 'Design with Heritage', a collaborative project between University College London Institute for Sustainable Heritage and the V&A Conservation Department. It investigated ways in which digital design could be used in exhibition and conservation contexts. The research looked at alternative methods for conserving and preserving works of art through the creation of facsimiles via new advances in 3D scanning and printing.

4. ON RESEARCH AND DISPLAY

'Computer Art and Technocultures', an Arts and Humanities Research Council (AHRC) funded project, was the first research undertaken by the Museum to examine and place the collection in a broader art historical, social and technological context. The project was a collaboration between the V&A and Birkbeck College and the research resulted in the V&A display 'Digital Pioneers' (2009-2010). Since then, the digital art collection has continued to be the subject of ongoing research. For example, the V&A exhibition 'Barbara Nessim: An Artful Life' (2013-2013) provided an overview of the career of the American artist and designer. Nessim was one of the first professional illustrators to use the computer as an artistic tool; the display of her work covered her prolific career as an illustrator and fashion designer from the 1960s to the present day. The acquisition of Nessim's work led directly to a research paper being published on the relationship between women, art and technology. Focusing on the V&A's national collection of computer art, the research contextualised early digital practices and documented the significant contribution made by female artists, curators and educators.

The collection has continued to be displayed in multiple contexts both within and outside of the museum realm. For example 'Digital Transformations: prints from the V&A computer art collection' was displayed at Great Western Hospital, Swindon (2012) and Royal Brompton Hospital (2013). The exhibition, curated in collaboration with the charity Paintings in Hospitals, explored ideas about digital technologies, computational processes and time and brought together a range of artists who use the computer as an expressive and experimental medium. In 2014 Casey Reas's artwork *Process 18 (Software 3)* was loaned to Chelsea and Westminster Hospital and in 2015 the V&A's Sackler Conference addressed the role of interactive and digital art in healthcare environments. The conference and showcase reflected on the principles of design in health and considered the potential of digital innovations to empower individuals and revolutionise healthcare experiences.

5. FIRST ENCOUNTERS

The permanent collection represents one channel through which V&A visitors encounter digital art. The Museum has a strong track record of commissioning digital artists to produce temporary installations. For example, the V&A's former Contemporary team organised 'Digital > Responses' (2002-3) in which artists created works in response to objects and spaces in the V&A, and 'Volume' (2006-7), a luminous interactive installation in the Museum's John Madejski Garden. Temporary commissions remain one of the many ways visitors experience digital art in the Museum. Today most of the V&A's visitors first engage with the Museum online (in 2014/15 this figure exceeded 15 million) as a consequence many first encounters with digital art and design 'in' the Museum are also online. *Liquid Citizenship* is an online work by artist Femke Herregraven, commissioned by the V&A earlier this year as part of the exhibition 'All of This Belongs to You'. The work explores the fluidity of national citizenship as an asset to be purchased, traded or revoked. The site gathers together international data on citizenship opportunities and exemptions, enabling visitors to explore the offers available for purchasing a national passport, or acquiring citizenship through other means, such as naturalisation, people smuggling or asylum seeking. The commission was made by the Museum's newly established Design, Architecture and Digital Design department. It is heavily involved in documenting the impact of digital technology, acquiring works such as the Museum's first app, *Flappy Bird* and Cody Wilson's infamous 3D-printed gun.

The digital programme based in the Learning Department represents another avenue through which visitors engage with digital art and digital creativity in the Museum. Over 30,000 people per year take part in activities such as hackathons, 3D printing, wearables, and electronics as well as experiencing cutting edge digital art & design project demonstrations. The programme was founded in 2008 and aims to demystify technology and media by revealing its design processes, and empower visitors to become makers, not just consumers. It engages with all ages through free family friendly Digital Kids activities, Create! and Samsung Digital Classroom workshops aimed at young people and paid adult courses. The programme also includes Digital Futures, a monthly meetup and open platform for displaying and discussing work.

This networking event draws together people from different backgrounds and disciplines with a view to generating future collaborations. Each year the V&A is also home to the annual Digital Design Weekend which brings together artists, designers, engineers, scientists and celebrates the intersections of art, design and technology. Exploring themes such civic design, sustainability and collaborative making the festival encompasses multiple installations, workshops and performances across the V&A's galleries.

Figure 5: *Game Jam at the V&A*

6. CONCLUSION

A key objective in the V&A's 2014/15 annual report is to "Showcase the best of digital design and deliver an outstanding digital experience". Despite initial scepticism in the 1960s, the far reaching impact of digital creativity is now embraced by the Museum. The expansion of the digital art collection in the last 5 years enables a further appreciation of the historical and pioneering work of early practitioners, whilst the collection of contemporary digital art and design looks set to grow exponentially. Today visitors to the V&A can expect to be challenged by notions of what digital art and design is, and engage with it online, through the learning digital programme and the permanent collection.

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