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Demoscene Computer Artists and Community

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Abstract

The overwhelming variety of subjects in the field of born-digital content makes it difficult to classify and establish digital creative artwork. The lack of historical distance makes it even more difficult to identify art movements and summarize new art forms. Analyzing the Demoscene, a European subculture having the roots in the field of early computer generated graphic art, provides a first approach to structuring the scene and establish demoscene art as a facet of digital art. This formal structure is the basis for a conceptual solution in the field of digital preservation of complex dynamic media objects.

Keywords

Computer Demoscene, Digital Art, Ontology

1. Introduction

This contribution is part of a research to ensure the improvement of the long-term preservation of complex digital artefacts and the knowledge transfer of digital handcraft techniques. It is about analyzing and structuring the technology used materials and methods to constitute the Demoscene as an art movement.

The field of real-time audiovisual animation as one facet seems to be the royal discipline in which creative individual performances of various artistic handcraft practices are combined. This makes these computer-generated presentations, their platforms and not least the scene primary objects of research. A sustaining documentation of this vivid and largely undocumented world of sub cultural “Demo art” requires a fundamental understanding of the origins of tools being used which further allows the examination and analysis of artistic and experimental use of media technology.

Domain specific research, data collection and analysis take a key role in the context of documentation. Based on archives, portals and community websites relevant topics, objects and their relations have to be analyzed to visualize the context. An explicit analysis and characterization of the creative handcraft by the example of “Computer Demoscene” is mandatory.

2. The Computer Demoscene

Together with technical development niche cultures arise, forming their own norms, values and specific practices like net art, pixel art or Demo art. To distill the defining aspects of the Computer Demoscene, a historical overview is helpful.

The roots of the Demoscene reach far back to the first computer generated graphic art subcultures in the early 60s. Ben Laposky in the USA and Herbert W. Franke in Europe are considered as pioneers in the field of early computer art (Goodman 1987). Laposky’s creations of fleeting light images using a cathode-ray oscilloscope by supplying the deflecting electrodes with varying voltages based on different time functions is similar to classical elements used in Demo art. The same goes for Franke’s experiments programming geometric elements and curves on analogue and digital technology. This also applies to Charles Csuri’s first real-time animations and the usage of computer technology as a medium for art (Csuri 2012). His programmed functions with attributes manipulated by mathematical instructions are as sophisticated as algorithms used in Demo art.

The Computer Demoscene began in the early 80s where programming became a popular hobby activity. Until the 90s the scene was closely associated with the cracker scene. Demo artists initially developed small introductory presentations for cracked home computer games. This digital signature, so called Cracktro or Crack-Intro, was a start screen with logo of the cracker group, colored text, marquee with information on the game and greetings to friendly cracker groups, graphics, music and effects using the background color.



Figure 1: Crack-Intro (Fairlight, 1987)

Soon these cracktros became more spectacular than the games and developed into independent, real-time graphics, motion graphics and audiovisual arts.

2.1. Demoscene Insights

To complement their skills Demoscene artists formed groups of programmers, graphic designers and musicians, so called demo groups. The graphic artist wants to show how good he is at creating pictures and textures, the musician want to show how great he can compose and the programmer, also called coder, wants to demonstrate how well he can fit all together and what technical programming tricks and effects he can get out of the given hardware. The goal is to put the audience in awe, to impress and entertain.

The Computer Demoscene with their Demo art is a creative subculture with its own artistic expression and scene specific language. It is defined as “aspiring computer artists everywhere” (Shatz, P. 1993), “all people interested in demos” (Kuittinen 2001), “the scene, the demo community – a worldwide community of hobbyists interested in computer demos” (Reunanen 2010) and “a worldwide network of computer enthusiasts... a sub culture of the home computer culture” (Bolz 2011) producing “real-time, non-interactive applications along with music and graphics” (Scholz 2007).

These applications are executable programs that typically represent real-time audio-visual animations. Several special forms of Demo art products originated and were basically first classified by Borzyskowski in 2000 as follows:

Intro:	One or two routines
Dentro:	Preview of a demo
Demo:	More than two routines
Mega-Demo:	Linking of several demos.

A sampling survey of pouet.net, the largest web repository of news, groups and productions shows that Demoscene artworks today are primarily categorized into “Cracktros”, “Intros”, “Demos” and “Wild” (Pouet 2000). The category “Mega-demo” does not exist and just a few “Dentros” are collected. In total more than forty thousand artworks could be counted by crawling the portal and following the links to the original resources and collecting them.

Demo art type	Number of objects
Demo	ca. 24 000
Intro	ca. 5800
Cracktro	ca. 4400
4k	ca. 2000
64k	ca. 2000
Wild	ca. 1800
Invitation	ca. 1000
256b	ca. 700
1K	ca. 400
Dentro	ca. 350
Procedural graphics	ca. 150
Other	ca. 1700

Table 1: Different Demo art types and number of objects

It seems that the classification defined by Borzyskowski is not established or has changed due to technological change. One possible approach to the description of the basic structures of scene objects in form of an ontology is outlined in the following graphic. Objects, properties and their relations are exemplarily represented to visualize the context of Demoscene tools and materials today.

Over the years productions were subdivided into several competition oriented categories based on size limits and platforms they are designed for. Competitions are held on Demoscene events which are the most important community meetings for presenting new releases. For each event general competition rules and categories were defined. These rules and categories are indicative for an important quality criterion and are regarded as a constructive challenge within the scene. The general rules defining these restrictions seem to be not standardized and are changing gradually. On top of that some products cannot explicitly be assigned to only one category, they are categorized by size or not at all.

By analyzing the defined categories and rules of recent and older events published on the event websites, three main categories can be identified: Demo, Intro and others like graphics, music, wild, game and sub categories. While Demos are mostly categorized by hardware platforms like Commodore C64, Amiga, PC and Atari ST, Intros usually are classified by size limits like 4 kilobytes and 64 kilobyte and sometimes also by hardware platforms.

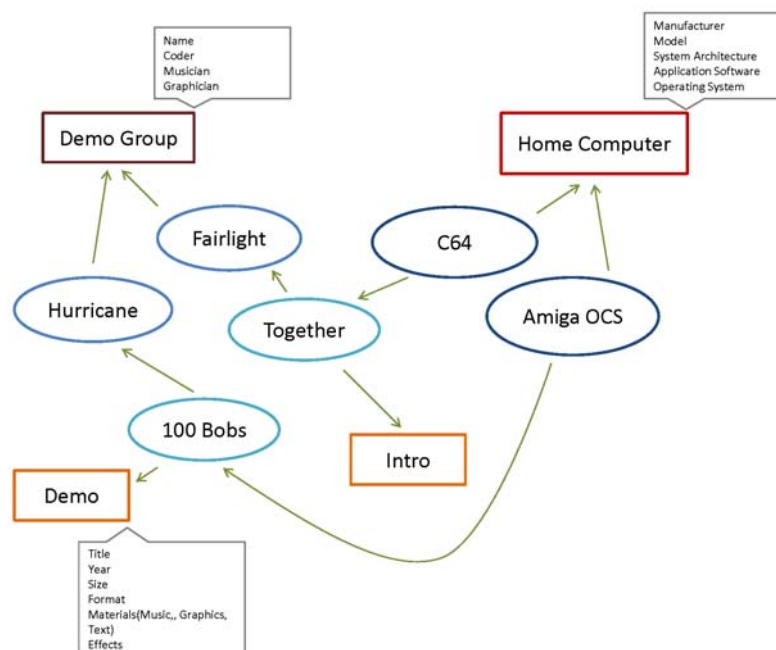


Figure 2: A model of Demoscene ontology

In total the use of over seventy different platforms can be counted, reaching from classic platforms like Commodore 64, Amiga and Atari ST to game consoles, handheld devices, mobile phones, operating systems and graphical user interfaces. Usually the activity is proportional to the actual distribution range of the platform, but also the access to appropriate development software plays a role.

2.2. Role of Hardware

First of all the “hackability” of the platform and its specifications formed the character of Demo artwork. Classic hardware with 8-bit, 16-bit and 32-bit architecture was commonly used.

Roughly speaking, with much effort not well documented or even inaccessible hardware was analyzed and reverse-engineered to create harmonically composed artwork with spectacular visual and audio tricks. Therefore a Demo programmer is often referred to as a craftsman who has mastered a particular cultural technique. The more simple the technological basis is, the more compact the net of aesthetic stimuli wants to be woven (Heikkilä, 2010) to realize always more complex and elaborate programmed tricks. It is expected that Demo artists will demonstrate their skills and pursue the principle to generate “... flashy bits written in custom assembly language and breaking every rules ...” (Shatz, 1993). In fact Assembler is still used for performance critical code but also programming languages like C++ are common. Beyond that there are various approaches of developing modular Demo editors. One example is mentioned at

this point, because it represents a reflection of the basic principles of the scene in dealing with resources and materials (farbrausch 2000).

From the impressive artistic artifacts that challenge the computer hardware at most, not only platform-specific styles but also compositional principles have emerged and are maintained until today (Hartmann, 2010).

3. Culture Techniques of Demo artists

The development of specific design techniques depends on the technical skills of the artist dealing with the machine, the tools and the scene specific handling of the existing repertoire of effects. Given hardware characteristics were successively studied and tested. However it can be observed that the use of new platforms will always build up on the use of an existing repertoire. On the one hand, active inventory, the backup and transfer of classical effects and principles of composition to new platforms is practiced. On the other hand, the new platform is used for more efficient implementation of established aesthetics and new versions of classic styles and principles arise.

3.1. Demoscene Classics

The structure of classic Demo art productions can be characterized by the use of classical elements which depends on the hardware. Graphics were animated with routines. Animations were made up of increasingly complex mathematically described objects and geometric shapes.

For platforms like C64 and Amiga OCS: text got scaled up and down, rotated, deformed, moved, fluttered and was typically presented in fast-paced or even dancing scroll effects or animation, tunnel, plasma, light and fire effects. Other classic old-school effects are for example the raster line interrupt and copper bar effect, both background effects that will display vertical and / or horizontal stripes of different resolution and color number on the screen. Programmers used clever tricks to make the elements look better and enriched them with as much effects as possible. Over time, highly complex effects and a variety of elements were used. While the classic Demo art also experienced a change in composition and content, Demos today are dominated by procedurally generated realistic 3D scenarios. With the widespread use of PCs in the mid 90s and the related variety of hardware a new era of the Computer Demoscene began. In contrast to the home computers, Demos on a PC may or may not work on another PC or are differently interpreting the program code. The Demo development was changing, screen composition, colors and innovative ideas came to the fore. Graphical presentation and fresh ideas had to convince the audience not only the technical masterpiece. Classic effects had to be reinvented or went out of fashion.

Faster processors and more computing resources were changing the possibilities previously limited by the hardware, for example playing a modest number of frames for a smooth, full-scale animation in the form of a film. The factor "real time" emerged as one most important quality criteria and principle of the Demoscene. Before real-time was the only way to animate images on the screen. For the viewer of a Demo it is not recognizable if a movie file or an executable program file with code-based animated graphics and sound is being played. He cannot monitor the real-time aspect. Real-time effects can only be judged based on the knowledge about the specific hardware requirements. If you record all Demos on video, it will not matter if one artist has released a Demo running ten seconds on ten floppy disks, or a Demo running 20 minutes on one floppy disk (Botz, 2011). By limiting the hardware and the size of the executable file not just comparability is achieved, but also the use of too many pre-computed animations is avoided (Reunanen 2010). These restrictions are regarded as a constructive challenge and are indicative for other important quality criteria of the scene.

3.2. Quantity and Tricks

Both the C64 and the Amiga only offer limited options to move objects horizontally and vertically on the screen. With this limitation a purely quantitative competition started.

Object to object records were broken, better written calculation routines became faster and more efficient. Same applies to image and sound productions. The available drawing programs for traditional platforms like for example Deluxe Paint for the Amiga generally provide all aspects of the graphics hardware. Users had access to a wide range of graphical features and effects limited to the original color graphics modes and the specifications of used hardware.

However, it was not uncommon improve them and make these add-ons available for free within the scene. Only through outstanding programming achievements and pioneering spirit existing limitations could be greatly exceeded and impressive graphics could be created. For example, special routines allow displaying up to 128 colors instead of the original 16 colors on a C64 screen (C64 Picture Gallery, 1999).



Figure 3: Hurricane – 100 Bobs, (Amiga-OCS-Demo, 1989)

4. Conclusion

The first analysis shows that the language used by the Demoscene community is formed by structural and social conditions but in fact the used language describes scene typical phenomena. The variety of subjects and forms of Demo art based on a huge amount of platforms using certain tools makes it difficult to develop a classification of this art movement and distinguish established trends in the Demoscene.

This research exemplarily outlines artistic works and practices as well as digital production techniques of computer generated visual media art from the early 80s until today. The analyzed portal contains a lot of valuable resources and context information as well as community annotations, but many resources are no longer available and especially the use of metadata is not uniform or even standardized. These inconsistencies in the specification of data structures complicate the accessibility to Demoscene media assets for public.

In further research more data and facts have to be collected and methodically processed while taking determined criteria for preservation (Hastik 2012) into account. A survey of all available internet resources must be made to develop a standardized metadata model.

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