Formation of a Long-Term Preservation Plan for a Computer Program by Siebren Versteeg

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1. Introduction

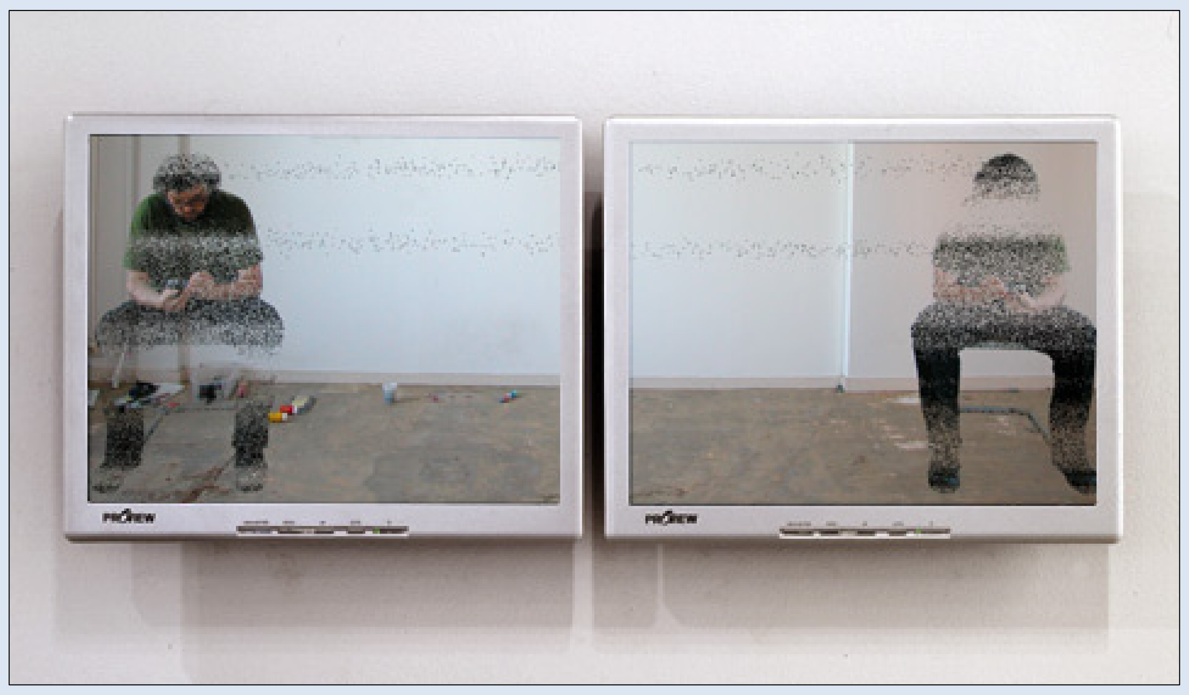
In 2014, conservation staff at the Hirshhorn Museum and Sculpture Garden performed a quality check (QC) on Siebren Versteeg's *Neither There Nor There* (2005), in preparation for display in the exhibition *Days of Endless Time*, one of the Hirshhorn's largest in-house exhibitions of electronic media.

Neither There Nor There is a computer algorithm-based artwork that outputs images of the artist in his studio on two LCD computer monitors mounted side by side. The installation shows a single image of the seated artist being continually constructed and deconstructed on each screen through the "movement" of pixels between the two monitors.

In 2010, a backup computer was provided by the artist in preparation for the piece's travel as part of the exhibition *The Cinema Effect: Illusion, Reality and the Moving Image*. During the 2014 QC, it was discovered that the copy of the program loaded on the backup computer was running at about double the speed compared to the copy on the computer originally obtained by the artist in 2007.

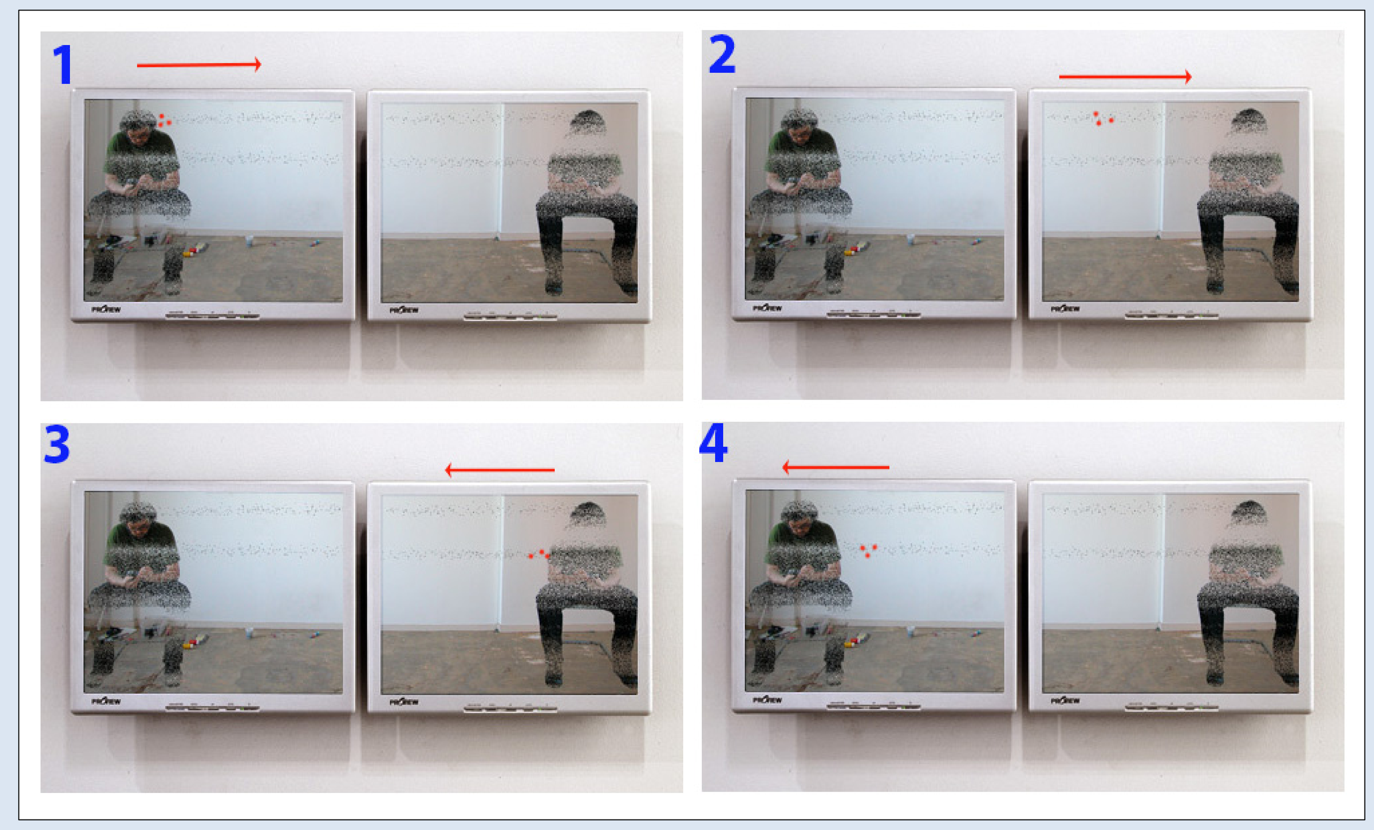
Through discussions with the Hirshhorn's curators, this difference in speed was deemed unacceptable for display of the work, as it disrupted the "dream-like" quality of the work intended by the artist.

Siebren Versteeg *Neither There Nor There* (2005)



Comparison of Video Documentation of the Algorithm Running on the Two Computer Systems

These are stills captured from video documentation of the program running on the original computer (top) and the backup computer (bottom). The difference in speed can be observed by the number of pixels that have travelled after a specified duration of time. After 1 minute, more pixels have travelled in the program run on the backup computer.



2. How it Works

In **Stage 1**, a pixel on the image of the artist on the left monitor is randomly chosen by the algorithm. This pixel begins to travel across the screen towards the opposite monitor on the right. Multiple pixels are chosen at the same time within a region, and each pixel is assigned a speed (within a pre-specified range), so they move at different rates.

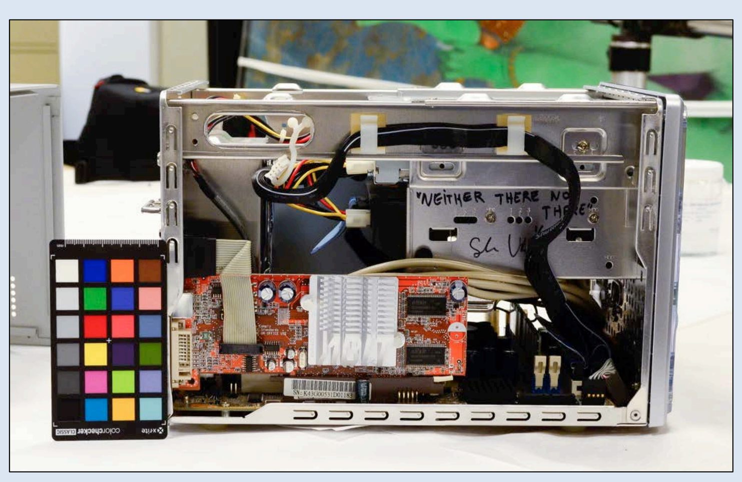
In **Stage 2**, the pixel reaches the edge of the display on the first monitor on the left. The pixel then reappears at the same vertical position on the right monitor and continues at the same speed. Once it arrives at a position on the right monitor equivalent to the mirror of its original location on the left, it stops. In this way a second images of the artist, now on the right monitor, begins to develop.

In **Stage 3**, another randomly selected pixel from the artist's image on the right monitor starts to move left towards the left monitor. It continues in same manner as the pixel described in Step 1.

In **Stage 4**, the pixel has crossed onto the left monitor, and will soon deposit on its corresponding location on the artist's image on the left monitor. The process continues indefinitely, causing a continual flow of pixels between the two monitors.

3. Methodology and Treatment Approach

The first step in our treatment plan was to fully document all hardware components and software settings associated with the artwork.



In consultations with Deena Engels (Clinical Professor and Associate Director of Undergraduate Studies for the Computer Science Minors programs, Department of Computer Science, New York University) and Mark Hellar (Owner of Hellar Studios LLC), we determined that **the difference in speed was likely caused by a lack of coding designed to regulate the run speed of the algorithm**. Lacking such coding would permit the program/artwork's executable file to run as fast as the computer's processor would allow. As the backup computer had a faster/more efficient processor than the original computer, this explained the faster overall movement of the pixels when the artwork was run using it.

With assistance from the Smithsonian Institution's Office of the Chief Information Officer, we investigated several methods of regulating the speed of the algorithm using non-invasive methods where possible:

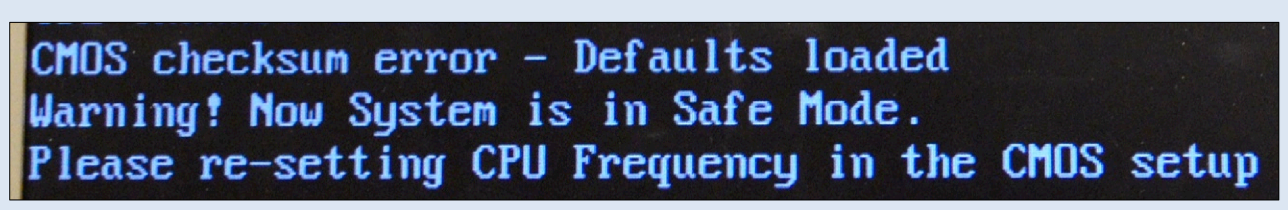
- Creating a duplicate of the original computer system using replacement parts
- Accessing the source code directly to diagnose and resolve the issue
- Modifying the existing computer system's processor to manage the speed of the program via CPU underclocking
- Emulating the system for display on another computer system

These methods proved to be unsuccessful due to:

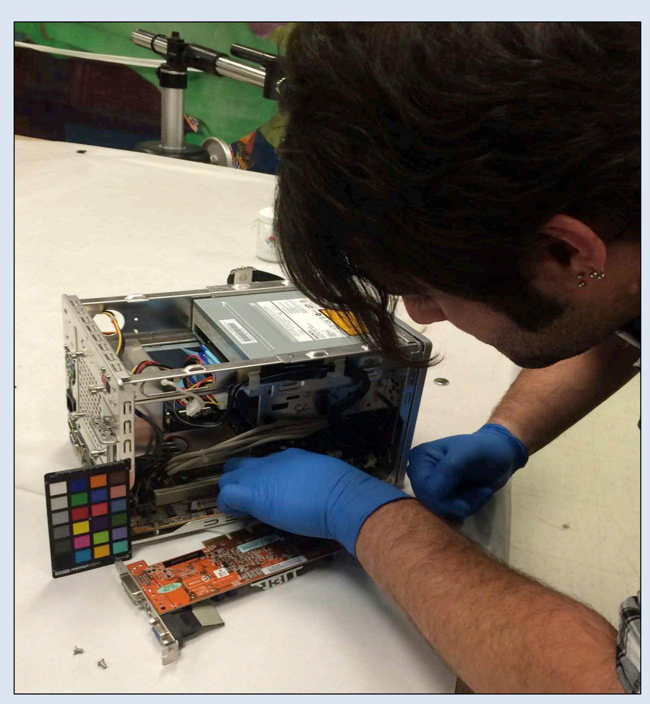
- Differences in hardware and software used in the two computers
- Limited availability of replacement parts
- Lack of access to Director v.8.5, the original coding platform

4. Treatment of Hardware Issues

Since 2010, an error message indicating a CMOS checksum error had been documented as appearing during the computer's initial startup. Complementary Metal-Oxide Semiconductor, or CMOS, technology is used in microprocessors and digital logic circuits to maintain the date, time, and hardware configurations for the computer.

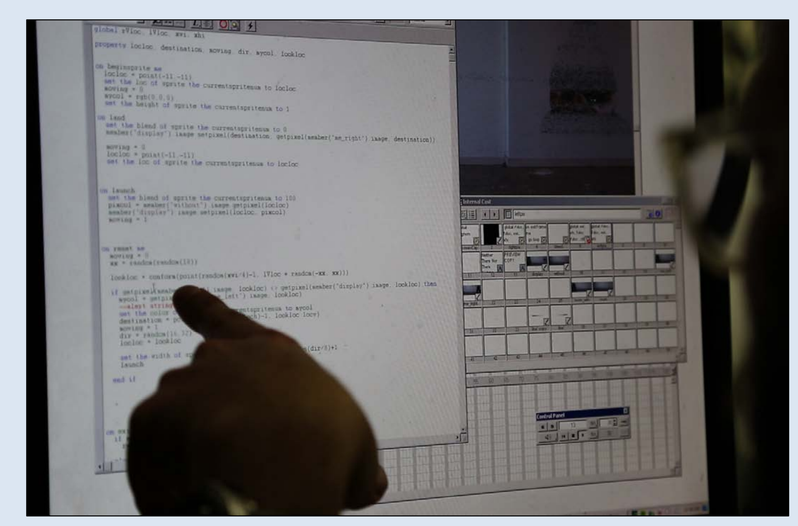


We learned that the CMOS error was likely being caused by a dead CMOS battery. In addition to the risk of a dead battery causing corrosion of the internal hardware, anecdotal evidence suggested that a dead CMOS battery may eventually cause the computer to fail to read the hard drives, so it was decided that the battery should be replaced. The CMOS battery issue was resolved by opening the computer and replacing the battery on the motherboard.



5. Artist Interview and Code Adjustment

In September 2014, the Hirshhorn's Time-based Media Group conducted an interview with Siebren Versteeg at his Brooklyn studio, which provided valuable information about his working style and the artwork itself. The artist was familiar with the differences in speed noted in this edition of *Neither There Nor There*, and confirmed that the issue was that the program did not contain code designed to govern its run speed.



Siebren explained the function of each and every line of code in his algorithm. He provided us with an updated copy of the algorithm, in which he had incorporated the code needed to regulate its speed within an appropriate range, independent of system hardware. He also discussed his thoughts on the display and long-term care of his work.

As a result of our efforts, the Museum obtained a documented history of the artwork, details on how it should function and be displayed, and the relationship between the institution and the artist was strengthened. The work was successfully displayed in *Days of Endless Time* between October 17, 2014 and April 2, 2015.

6. Moving Forward

Following the 2014 interview, the artist has continued his involvement with the preservation of the piece. During exhibition, a perceptible discrepancy in the brightness between the two monitors was noticed, indicating that the monitors are beginning to fail. Identical monitors to those initially provided are no longer available, so the Time-based Media Group is currently collaborating with Versteeg to source a viable set of backup monitors that preserve the artist's intended viewer's experience.

The Hirshhorn is now formulating a long-term preservation plan for *Neither There Nor There*. Both versions of the algorithm will be stored on the Hirshhorn's servers, the Smithsonian's Digital Asset Management System (DAMS), and in an off-site storage location. The integrity of the files stored across all three systems is planned to be monitored regularly through the use of checksum comparisons. This treatment reinforces the importance of documentation and collaboration in the care of electronic artworks.

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