DEL?No, Wait!REW:
The Impossibility of Authenticating Erasure

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Abstract

This paper reports on my ongoing practice based research, which aims to examine the importance of the 'Delete' function in the context and practice of Media Art. DEL?No, wait!REW is an interactive installation, which de- and re-contextualizes the process of data recovery by displaying found disclosures of retrieved data and posing a series of questions to the audience in a recurrent manner.

Keywords

Hard Drive; Interactive Installation; Digital Forensics; Data Recovery; Media Art; Delete; Save; Rewind; Residue.

Introduction

Emerging computational systems and digital information processing enable multiple backups of data by storing it on physical devices (hard drives) or web servers (the cloud), where the record has been saved in order to ensure it's preserved and can be accessed and retrieved at any time. On the other hand, deleting information permanently in the digital age has become a rather onerous task. [1] Previous research and media artworks have examined the importance of 'deletion' and its various cultural and technological ramifications. [2] [4] [6]

This paper introduces the DEL?No, wait!REW installation which takes on a forensic approach to a collection of discarded hard drives and constructively problematizes the notion of 'deletion,' confronting the audience with larger questions of how to secure deletion of data from a magnetic medium, data ownership and the ethics around data recovery. DEL?No, wait!REW also attempts to showcase and discuss some of the concerns raised among the participants of the installation.

Recovery process

I purchased online a collection of ten unformatted hard drives (SATA type) which had previously been used for video editing. Then I expanded my collection to over thirty drives, obtained from various sources: flea markets, scraps from old electronics and websites, where hard drives were bought and sold as commodities. I recovered a large number of lost files by scanning the whole disk or a partition of the drive. The recovery process was conducted by using open source data recovery software --TestDisk and Photo-Rec.[5]

In order to organize this accidentally found archive I followed a simple methodology. I sorted the hard drives by serial number, source of origin, date, time elapsed to recovery, actual size of the drive, and the size of retrieved information followed by simple content information.

DEL? No, wait!REW

DEL? No, wait!REW is an automatized system which recovers files from discarded hard drives without the consent or the knowledge of the previous owners who presume their content has been deleted forever. In the ongoing conversation about the impossibility of erasing digital traces, the installation aims to confront participants with an ethical choice of whether to delete a recovered file or to save it by publishing it online.

The installation consists of three core elements: display screens showing the graphical user interface (GUI); a tangible physical interface, or controller; and a spatial element – a lit table top, which acts as one of two light sources.

The DEL?No, wait!REW installation is intended to be displayed in a dark space. A stream of light is cast by the screens and the lit table top. A spinning hard drive is connected to Display Screen No. 1, which shows the data recovery process in real time using open source software. A cold steel controller reminiscent of an industrial machine is placed at the center. [fig.1] The controller has two buttons: Delete and Save. Delete provides the option to permanently remove a file from the system; Save uploads the file online. Display Screen No. 2 highlights a custom written software, which facilitates user interaction by communicating with the controller. Once the save option is chosen, the retrieved file is saved on a remote server and published in an online gallery. Saved files get projected on Display Screen No. 3. The physicality of the hard drives, the source of the data recovery procedure, is present at the exhibition space. In some respects, DEL?No, wait!REW highlights the physical omnipresence of data storages and at the same time reveals the processes running on a machine.

Figure 1. Physical interface of a controller used in the DEL?No, wait!REW installation

Discussion

Several insights can be drawn from the participants' interaction with the DEL?No, wait!REW installation. For example, a major concern among the participants was how to achieve secure deletion of their electronic data.

According to previous technical research [3], in order to ensure that electronic data has been deleted permanently from a computer's memory, the drive's entire content must be overwritten with 0's and 1's an arbitrarily large number of times written to the same location as the original. Common practice shows that the only way to confirm that data is ultimately deleted is by physically destroying the hard drive. However, most users are unaware of or don't possess the technological know-how involving the structuring, storing and deletion of electronic data. DEL?No, wait!REW forces participants to rethink the fallibility of technology and what happens when they trash files into digital recycle bins.

The aim of the DEL?No, wait!REW installation lies in re-introducing the importance of the 'delete' function in the digital realm and setting up a series of questions providing grounds for further discussion. However it fails to reassure participants that when the delete button is selected, the data has been authentically deleted as it continues to exist on the magnetic disk, which is present at the exhibition space.

Another insight, which can be concluded based on participants' interaction is that often the viewers associate themselves with the actual owner/s of the hard drives who remain unknown. Giving the control to the participants to decide whether to make someone's data public or discard it without the knowledge or the consent of the previous owners highlights the inherently slippery nature of digital data and the resulting loss of ownership over digital information.

Conclusions

In this paper, I presented the installation DEL?No, wait!REW as a case study of an automatized binary system that aims to introduce the importance of 'delete' and its multiple aspects; the secure deletion of a data carrier, the loss of ownership of digital data and the ethics of data recovery. The DEL?No, wait!REW installation takes a second look at a collection of discarded hard drives containing digital files, which were thought to have been forever erased. The process of the aforementioned data recovery and data exposure is performed without the control or consent of the original creator.

Exposing the physical aspects of the data storage devices and showing in real time all the running machine processes succeeds in confronting the participants with the impossibility to authenticate erasure while hitting the delete key.

Acknowledgements

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Author

Michaela Lakova (BG) is a visual artist and researcher. She holds a Master's degree in Media Design and Communication from Piet Zwart Institute. She takes a lost and found approach to media. Her field of research and practice involves catchy bits and bytes of errors, systems malfunction and the inevitable generation of data traces and its problematic resistance to deletion.