The Bronze Key: Performing and Materializing a Cipher System

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ABSTRACT

The Bronze Key is an art installation where data traces of bodily movement captured in 3D by digital systems are re-materialized into audio, bronze and print. The 3 objects of *The Bronze Key* represent the performance of the first 3 steps of the basic symmetrical cipher system: The Plaintext, The Key and The Ciphertext(or Cryptogram). This project is an embodied and performative intervention in discourses and practices around data privacy and strategies for data obfuscation. It is the result of a collaborative and experimental design process involving dance, motion capture, 3D visualisations and VR.

Fig 1 The Plaintext mocap data

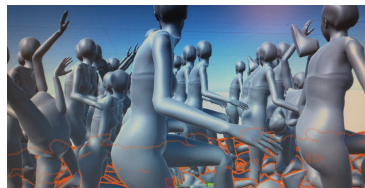Fig 2. The Key capture

Fig 3. Cast for bronze version of Key

Fig 4. The Ciphertext in Unity

CCS CONCEPTS

• **Human Centred Computing → Interaction Design**; *Interaction Design Theory Concepts and Paradigms*; **→ Interaction Paradigms;** *Virtual Reality* • **Security and Privacy → Cryptography** Symmetric Cryptography and Hash Functions

KEYWORDS

Materiality, Motion Capture, Virtual Reality, Encryption, Performativity, Embodied Interaction

1   PERFORMING ENCRYPTION

The alternative to leaving data open and unprotected is to cultivate practices of obfuscation, including encryption [1-3]. An encryption process is made up of a set of actions that render confidential communication unintelligible, or intelligible only to those with whom we desire to communicate [4]. A basic symmetrical cipher system has the following steps: A Plaintext (readable message) is encrypted by means of an encryption algorithm (also called a Key) into incomprehensible Ciphertext, it is then decrypted by the designated recipient using the same key to reveal the original message. This is a temporal process.

The Bronze Key installation consists of: 1) The Plaintext: a 30 second movement sequence captured using the Perception Neuron motion capture system, materialized as numerical data recorded as text-to-speech and played on magnetic audio tape (Reel-to-Reel) (Fig.1); 2) The Key: an arm and hand gesture lasting 1 second captured using Oculus Rift's Quill, 3D printed and cast in bronze (Figs. 2 & 3); 3) The Ciphertext: a version of the original movement data encrypted using the Key, visualized in Unity (Fig. 4), printed as a book (73,000 lines of data on 668 pages).

Obfuscation of data occurred as a series of re-materializations: from body, to digital data, to analogue materials. This performative approach to encryption has the goals of re-configuring the body's relation to data and fostering of controversies around protection of bodily data traces [5].

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