Whisper: Sensing and Enciphering Secrets Through a Kinetic Installation

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Abstract
The installation Whisper is transforming spoken secrets into motion and light reflections. The thereby created visualization of the secrets is not understandable using common communication modalities. As such, Whisper is creating a magic moment of information translation into a language of motion and light. Whisper allows visitors to see the whispering of a secret without hearing it, and therefore it allows the secret to keep its most important feature, not to be revealed. As such, Whisper enables an engagement of the public with their hidden intimate part and thus, it is creating moments of intimacy and playful beauty.

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Installation; kinetic sculpture; light choreography; encipher.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction
Whistleblower Edward Snowden's disclosures made it common knowledge that any digital communication is a target of constant surveillance and espionage.

Figure 1: *Whisper* allows you to see the whispering of a secret as reflected light without hearing it, and therefore it allows the secret to keep its most important feature, not to be revealed.

Consequently, researchers and artists dedicate their work to topics concerned with enciphering, surveillance, and espionage. Steven Mann dedicated much of his recent work to surveillance, or how he names it, on sousveillance, e.g. to create awareness on where we are captured by cameras in our daily environment [4]. However, there are not only huge privacy issues with being observed without our knowledge. Personal, business, and government communication is systematically observed. Art is addressing that issue. For example, the Golden Nica in the 2016 Prix Ars Electronica's Interactive Art + category was given to Christoph Wachter and Mathias Jud for their work "Can you hear me?" – a temporary network set up above the rooftops of the German government district in Berlin.[1] Through the autonomous WiFi communications network the artists invited anyone in Central Berlin to send messages to the American NSA and the British GCHQ on the exact frequencies they were monitoring.

Cryptography has become a very important part of computer technology and an integral part of digital communication. The ability to encrypt and decrypt information is crucial to secure any form of digital communication.

The installation *Whisper*, shown in Fig. 1, provides an opportunity to explore the communication of secrets using a cross-modal enciphering technique. Spoken secrets are enciphered into a motion and light

1 http://www.aec.at/aeblog/en/2016/06/08/canyouhearme/

choreography and thus, they are save from being read by those we do not want to share our secrets with.

The installation contains a microphone attached to the wall for listening to whispered secrets. A cylinder shape contains small gold vertically oriented elements that permit the visualization of the whispered secrets by moving the plates according to the secret's sound.

Through this work, we aim to explore the most hidden and intimate part of a human being by trying to create an interaction between the people and their communication data transformed from speech into motion and then into light. The *Whisper* mechanism helps people in expressing hidden qualities of their being without affecting their privacy. We will discuss how keeping a secret could be a damage in our behavior and how art can be used to inspire solutions in secret telling under the condition of privacy protection.

Related Work

Whisper is a visual-kinetic representation of sound, which is inspired by other art works also using the concept of live sound visualization:

Rafael Lozano-hemmer explored vocal improvisation in "Voice array" [2]. This installation encouraged the audience to record their voice, which was immediately translated into a series of light flashes, played in a loop until the next participant spoke into the intercom and so the machine started to gradually accumulate the voices of the public.

"Voz alta" [3] was a project where a megaphone was placed on the site of a massacre to convert people's voices into powerful flashes of light.

Unlike other audio-visual art installations, which use a visualization of sound waves - from music or human voices- directly in a form of light, *Whisper* decodes sound waves of whispering into electricity to move two motors that move metal plates. Thereby, we create motion of a blower, which then again creates a choreography of light through reflective material. This characteristic allows the installation to represent a secret based on an interwoven creation of sound-caused motion, motion-caused light reflections.

Concept Idea

What is a secret? We have thoughts of all kinds, but how many of them are then revealed? When we choose not to say what we think, this can become our intimate secret, a thought of which we only know the context and meaning.

A secret is an information or a fact that you keep hidden and which you do not reveal to anyone. It can remain as such only if not pronounced. When it is revealed it loses its essence of privacy. For that reason, we whisper a secret. The sound of a whisper makes the words indistinguishable and therefore, the secret cannot be heard, but it might be seen.

Articulating secrets can free people and hiding them can cause problems as argued by Michael Slepian "keeping secrets brings negative consequences for mental and physical well-being" [5]. The more you feel preoccupied by a secret and think about it, the more you are using your personal resources and the less energy you feel you have available to pursue other tasks. As the Selpian's study affirms "if one feels that he or she has fewer resources available to act upon the external environment, that environment is judged as

more challenging. [...] Holding secrets can affect people in the same way that carrying physical weight does. [...] The oppression of a secret can lead people to draw back from their social lives and even perform worse at work".

However, speaking out secrets in a world of permanent surveillance may be difficult as surveillance is destroying the inner logic of a secret – being not shared to anybody we do not want the secret to share with.

Concept Implementation

The installation Whisper is a kinetic sculpture, which allows you to communicate secret without sharing it, and therefore it allows the secret to keep its most important feature, not to be revealed. The goal is to create a visualization of a whisper. To realize this aim, we used a configuration of different elements.

The setup consists out of:

- A cylindrical shape full of golden metal disks installed on the metal ring by little rings which allow each metal disk to move independently;
- The blower in the middle of the structure follows computer generated coordinates to move and blow cold air on the golden disks;
- Two motors of different kinds are used to permit the blower to move 360° around the center of the structure and vertically on an angle of 45°;
- The microphone is attached to the wall close by the cylindrical shape;
- An Arduino converts the sonic information into coordinates for the motors;
- The light is placed pointing indirectly the structure for creating reflections on the walls.

When a person is approaching the installation he/she can whisper a secret into the microphone. After a moment, the light reflection around the installation starts to dance and the plates on the cylinder create subtle metallic sounds, see Fig. 2.

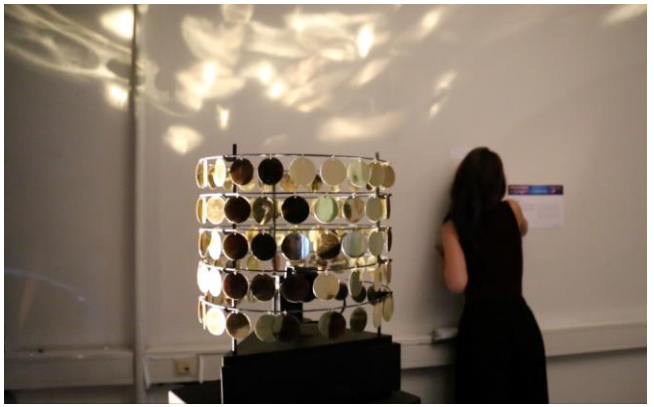

Figure 2: When whispering in the microphone, the audio wave information is translated directly into the two motors movement, which causes light reflections on the wall.

Discussion & Conclusion

This installation offers the opportunity of telling secrets that nobody will know afterwards. It enables users to share something usually hided information without interfering their own privacy.

Whisper is kinetic art and thus contains movement perceivable by the viewer and depends on motion for its effect by incorporate multidimensional movement [6]. However, we used motion and kinetics only as

modality to express our idea, which is concerned with the enciphering of secrets.

Enciphering is – so far and to our best knowledge – underexplored in digital art and design projects.

Ciphering is a 3D printable ring that costumers configure on a website[2]. They enter 4 digits or 2 letters plus 2 digits, and then a ring will be produced that has slits which form the entered digits and numbers when seeing through.

Cryptographic is a project that is creating images that contain cryptographic text messaged by simply using an arrangement of colors in squarer that correspond to a character[3].

Compared to *Ciphering* and *Cryptographic*, *Whisper* is different in certain aspects. First, *Whisper* is ephemeral. Second, *Whisper* is an art installation, while the other two projects are closer to what we could consider as design products. Third, *Whisper* goes beyond the translation of a message into another less or not understandable. *Whisper* is concerning with the experience of telling secrets as a freeing act and hence, the project is creating a unique experience during the process of ciphering a message.

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2 http://ciphering.me/

3 http://cryptographics.io/

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