101 Critical Security & Privacy Concepts*

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ABSTRACT

In this paper, we investigate an alternative method for communicating the somewhat elusive risks and invasions of the security and privacy of technology, the web, social networks, and other aspects of modern life. Specifically, we draw from the *critical design* movement popularized by Dunne and Raby in the 90s. In this project, we have conceptualized 101 new technological designs and described their use through short vignettes. These designs are of imaginary but plausible technologies that illustrate a security or privacy risk through absurdity, satire, or humour. We present a selection of them with remarks on their design.

1. INTRODUCTORY REMARKS

Blah, blah, blah

2. PRELIMINARIES

Critical design is commonly attributed to Dunne and Raby [2, 1] however it can be seen has a refinement of earlier movements in arts and design, beginning with the Italian radical design movement and extending through critical practice in HCI [4].

Consider the three examples provided in Table 1. Each describes the design of an object or technology. In contrast to industrial design, these technologies are not meant for mass production. Rather they offer a subtle criticism by illustrating something—electromagnetic radiation, the inevitability of death, the ubiquity and stealth of surveillance—that typically goes unquestioned and/or creating a dilemma for the user.

Commonly, critical designs are either simply described or they are built and displayed (see relation to art below). In the case of Dunne and Raby's Compass Table (and seven other objects in their Placebo project), the table was built and given to individuals to use. This field study followed by an exit survey inquiring about how they felt about the object. In this paper, we describe our designs through short vignettes that illustrate its design and use case. With a good design, the reader should easily imagine its use in her life and question it critically, resulting in 'rhetorical use' [4] rather than practical use. Designs typically provoke the reader's emotions by invoking humour, satire, ridicule, poetry, playfulness, lewdness, appropriation, irreverence or deliberate overcompensation. We tag our own designs to distill out the intended mechanism.

Relation to Design.

Much of design is oriented around problem-solving and the creation of functional, useful, and pleasurable solutions to practical problems. Critical design is about raising a question or communicating an idea.

Relation to Art.

Critical design has significant overlap with conceptual art, utilizing common methods, and has been disseminated through exhibitions and the art literature. However critical design works by showcasing things that are plausible, believable, and easy for the reader to situate—this requires the same design principles and methodologies as product design. Viewing critical design as art also creates challenges. Consider the compass table in the context of an art gallery exhibit—it is meant to illustrate EMR in every day life, in one's home, in different positions and orientations within that home—all of this is lost when it sits statically in a gallery. This can be compensated for through an accompanying vignette or film or narrative describing its context of use.

Relation to Science.

Critical design is ideological. But so is science. Even cryptography, positioned as one of the most scientifically rigorous pursuits in the field of security and privacy, is ideological, as argued eloquently by Rogaway in his recent essay [5]. For example, he notes that work on bland-sounding subjects like differential privacy and identity-based encryption are premised on a certain world view — respectively, one of massive data collection and government-escrowed master decryption keys.

From a different angle, Herley and van Oorschot question which aspects of security, privacy, and cryptography are even a proper science [3]. Critical design is not an objective form of design where success can be measured. We purposely do not set out to 'measure' the success of our designs as this deeply misses the point of critical design. While our designs

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Table 1: Examples of Critical Design

Work	Description
Compass Table, A. Dunne F. Raby	"This table reminds you that electronic objects extend beyond their visible limits. The 25 compasses set into its surface twitch and spin when objects like mobile phones or laptop computers are placed on it. The twitching needles can be interpreted as being either sinister or charming, depending on the viewer's state of mind. When we designed the compass table, we wondered if a neat-freak might try to make all the needles line up, ignoring the architectural space of the room in favour of the Earth's magnetic field." Quoted from [2].
Life Counter, I. Matsumoto	"With Life Counter (2001), you choose how many years you would like to or expect to live for and start the counter. Once activated, it counts down the selected time span at four different rates: the number of years, days, hours or seconds to go are shown on different faces. Depending on which face you choose to display, you may feel very relaxed as the years stretch out ahead or begin to panic as you see your life speed away before your eyes. The counter is designed to be visually unassuming and could easily fit into the slightly retro-futuristic style of the moment." Quoted from [2].
Open Informant, J Ardern Y. Ushigome A. Jain	"Open Informant (2013) takes the form of a networked object including a phone app and e-ink badge. The app searches your communications for National Security Agency trigger words and then sends text fragments containing these words to the badge worn by the user for public display. Using the body as an instrument for protest, the badge becomes a means of rendering our own voice visible in an otherwise faceless technological panopticon." Quoted from [4].

are for scientists, engineers, and technologists, it is not to establish theorems or facts but to raise questions.

Related Work

3. REFERENCES

[1] A. Dunne. *Hertzian Tales*. MIT, 2005.

[2] A. Dunne and F. Raby. *Design Noir: The Secret Life of Electronic Objects*. Birkhauser, 2000.

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[4] M. Malpass. *Critical Design in Context: History, Theory, and Practices*. Bloomsbury, 2017.

[5] P. Rogaway. The moral character of cryptographic work. Technical report, IACR Cryptology ePrint Archive, 2015.