Feeling Scarcity: Augmenting Human Feelings through Physicalizations of Energy Consumption, Attention Depletion and Animal Murder

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Figure 1: The *'Fireplace'*: a lamp that uses electromagnetically fixed logs to symbolize kilowatt hours used in the household and drops the logs over the course of a day, requiring users to carefully put the logs back, in order to restore electricity.

ABSTRACT

We describe the results of a design project about making scarce resources perceptible: a campfire-inspired lamp, a router, and a knife block. All three are 'designed for discomfort' and intended to serve as thought-provoking objects.

CCS CONCEPTS

• **Human-centered computing → Haptic devices**.

KEYWORDS

limited resources, critical consumption, meat, attention, energy, haptic displays, shape-changing interfaces

1 INTRODUCTION

Resources are limited. For a long time, this was an immediate experience: not enough food made people hungry. Not enough money let their pockets empty. Not enough energy left the lights out. As a side effect of globalization, the limitation of resources has become harder to feel, especially in industrialized countries: often, scarcity is something we *know* about, not something we *feel*. In a recent design project, we conceptualized three products that turn scarcity into experience. It focuses on meat, attention, and energy.

2 BACKGROUND

Research in the area of raising awareness for resource limitation is actively pursued. Regarding energy consumption, Zapico et al. have explored persuasive tools that promote low-carbon dioxide lifestyles [17], as well as eco-feedback visualizations [16]. Bang et al. propose a game to raise the awareness of domestic energy consumption [1]. The addictive [14] and often negative [9] effects of mobile social media consumption on attention and conversation have been widely explored [12, 13]. HCI projects in this area focus, for instance, on distractions while reading [4] and driving [10]. Lyngs et al. investigate means to self-regulate one's ICT use [11]. Regarding meat consumption, the effects of immersive video and head-mounted displays on choosing to adopt a vegetarian diet are explored by Fonseca et al. [6]. Wai et al. investigate interactive installations to foster animal sorrow [15], Casas et al. propose chatbots to encourage conscious consumption [3]. Farr-Wharton et al. show possible effects of mobile apps on food waste mitigation [5].

Figure 2: The *'Router'*: a shape-changing wireless access point which physically runs empty as data is used over the day (and, thus, attention diminishes). It also requires users to calmly touch it to restore connectivity, forcing them to pause and contemplate for a moment.

Figure 3: The *'Cut'*: a knife block that requires users to scan products before letting them cut, and – through a haptic feedback mechanism – requires them to brutally stab the knife back after cutting meat, causing a feeling similar to kill an animal.

3 CONCEPTS

In this section, we present the concepts that were the result of our project. All three concepts below exist as non-functional prototypes.

3.1 Energy requires Effort

The 'Fireplace' (Fig. 1) is a lamp that is connected to a household's smart energy meter. It also includes wooden sticks, which are attached to the lamp with electromagnets. Each stick represents one kilowatt hour. As the lamp contains six sticks, it represents six kilowatt hours, which is the current worldwide average energy usage per capita [**?**].

Once one kilowatt hour has been used, a stick falls over. When all sticks have fallen over, the household's power connection is cut. To restore it, at least one stick must be placed back on the lamp. Its design is based on the idea of energy requiring work, which is made palpable for the user through the simple, archaic act of putting up logs of wood on a fireplace.

3.2 Data requires Attention

The 'Router' (Fig. 2) is a shape-changing wireless access point, which displays depleting attention over the course of a day through changes in its shape.

Its design is based on the idea of attention being a resource that is used up over the day. It is conceptualized to contain a vacuum chamber, from which air is evacuated as data is transmitted through the device. This leads to a hole emerging in the device's top. This will also reduce the available bandwidth. To resume full internet connectivity, users have to calmly stand by and touch the device, encouraged to contemplate for a moment.

3.3 Meat requires Murder

The 'Cut' (Fig. 3) is a knife block that emulates the brutality of killing an animal before eating meat. Its design is based on the idea of making the user experience how it feels to shove a knife into a living animal. Technically, it is conceptualized to consist of a brake system (similar to the one proposed in [8]), coupled to an audio system.

A barcode scanner is used to scan the meat's packaging. Depending on the conditions under which the animal lived, it is harder to reinsert the knife into the block after cutting the meat with it. The block will resist, make sounds of a dying animal, and require the brutality of killing an animal to be exerted by the user.

4 DISCUSSION

We presented a series of design concepts, all of which were created to foster critical reflections of consumption.

As none of the concepts has been implemented as a functional prototype, their effect on actual usage remains unclear. Nonetheless, we hope to inspire future researchers to think about similar consumption-critical devices.

In that, this project is much inspired by Bardzell and Bardzell's concept of Interaction Criticism [2], as well as by Laschke and Hassenzahl's 'Pleasurable Troublemakers' project, which promote critical and reflective consumption through increased effort [7].

A knife block that rejects knives, a lamp that turns off the power and a router that disconnects from the internet – all of the above could be described as 'dysfunctional' products. However, the question arises what is actually dysfunct: the aforementioned products or our lifestyle.

Interestingly, human intellect doesn't seem to suffice when it comes to behavioral change in terms of meat, social media and energy consumption. We *know* that energy is scarce, we *know* that eating meat means killing animals, we *know* that smartphone usage undermines our relationships to our friends, our family and ourselves. Yet, we do not behave accordingly. Thus, this project seeks to show how human *feelings* can be augmented: stimulated through uncomfortable interactions with technology, and thereby potentially helping us to stop ignoring what we know.

5 CONCLUSION AND OUTLOOK

The described concepts are only concepts. Next, they should be implemented into functional prototypes, in order to test their impact on people's meat, data and energy consumption habits.

The side-effects of our global, digitalized economy make it hard for us to feel the limitations of our consumption. Helping people to experience these, and, consequently, to adjust their behavior accordingly, might be a quest worth pursuing.

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