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# Designing for Material Awareness in Everyday Life

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**Abstract**

This paper argues for the experiential desirability and critical importance—in terms of environmental sustainability—of designing for reflection on everyday material things themselves. This paper motivates and proposes a *material awareness* design approach. A series of conceptual designs and prototypes are presented to help illustrate this approach.

**Keywords**

Sustainability, reflection, design, material awareness

**ACM Classification Keywords**

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

**Introduction**

In this paper, I propose designing for reflection on the materiality of the everyday: the presence of particular material things in our lives and our experiences with these things. I propose a *material awareness* approach to design and argue that such an approach may offer strong potential to both enhance our everyday experience with things as well as promote more enduring and environmentally sustainable relationships with material things—potentially slowing the rates at which we dispose of and replace technology products.

In what immediately follows, I (i) discuss relevant work related to sustainable design, (ii) propose a *material*

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**Figure 1.** The Table that Counts displays the total number of heavy objects that have been placed on it during its lifetime.

*awareness* approach to design, drawing on existing reflective approaches, and (iii) present a series of conceptual design proposals and prototypes to help illustrate the material awareness approach.

### **Sustainable design and product durability**

Sustainability has emerged as a key area of interest for interaction design and HCI. Recent work in HCI and interaction design has used reflection as a design strategy to promote more sustainable attitudes and behaviors. In particular, there is a nascent and growing body of research and design work in the area of energy awareness that emphasizes aesthetic experience and critical reflection [e.g., 1]. However, designs that promote reflection on consumption have focused almost exclusively on electricity and other resources consumed by products (e.g. water) rather than the high replacement and disposal rates of technology products themselves. The importance of design approaches that address the rapid replacement and disposal of technology has been discussed within the context of industrial design by Verbeek [8] and others, and within the context of HCI and interaction design by Odom et al. [6] and others.

### **Material Awareness**

Motivated by work in reflective design and sustainable design, I propose a *material awareness* approach to design. The *material awareness* approach is concerned with designing for reflection on material things—and our everyday experiences with unique and particular things themselves—in aesthetic, engaging, and provocative ways, thereby encouraging more enduring and sustainable relationships with particular things or discouraging thoughtless consumption of things in general. This approach draws heavily on existing

reflective approaches to design [e.g., 2,3,7], which illustrate ways that design can stimulate reflection on and integrate reflection into everyday life. However, the material awareness approach is specifically concerned with revealing the materiality of the everyday itself, what Lefebvre suggests is at once both “*the most obvious and the best hidden.*” [4]:8. Further, the material awareness approach emphasizes designing to promote reflection on what Nelson and Stolterman refer to as the *ultimate particular* [5], e.g., *this* particular chair, as opposed to chairs in general.

In order to more concretely investigate the potential for material awareness in everyday life, I am developing a series of redesigned familiar domestic products. In the future, I intend to use these designs as probes to elicit thoughtful responses from users. These designs employ two primary strategies: (i) amplifying the histories of objects and (ii) amplifying the agency of objects. Next, I present several designs for each strategy.

### **Amplifying the histories of objects**

An heirloom chair is irreplaceable because of its unique materials and signs of use accumulated over time. How might digital technology be used to amplify perceptions of the unique histories of particular objects over time—and our experiential histories with them—in order to encourage attachment to these objects? In order to investigate this question, I am developing a series of products augmented with small numerical displays—or *counters*—and various sensors in order to record and display simple histories of use. Several of these *Objects that Count* are presented here.

The *Table that Counts* (figure 1) has a counter embedded in its face displaying the total number of



**Figure 2.** The Lamp that Counts displays the total number of years, days, hours, minutes, seconds and milliseconds the lamp has been lit during its lifetime (milliseconds not shown in this prototype).

times a heavy object has been placed on the table during its lifetime. Dropping an object on the table or otherwise causing shock to its surface causes the counter to become erratic, gradually returning to its correct count. The numbers on the counter begin to gradually dim if no new objects are placed on the table; eventually, the numbers fade out completely. Placing a new object on the table restores the numbers to the normal brightness level. Will the table encourage people to engage with it or treat it with care? Will its owner think twice about replacing the table when she or he reflects on the number displayed?

The *Lamp that Counts* (figure 2) has a counter embedded in the lampshade displaying the total number of years, days, hours, minutes, seconds and milliseconds the lamp has been lit during its lifetime. Turning the lamp on starts the timer; turning off the lamp stops the timer. Will the user think more consciously about her or his use of the lamp when she or he observes the rapidly increasing number? Will its owner think twice about discarding the lamp when she or he reflects on precisely how long it has been used?

The simple and direct communication of previously inaccessible—and not obviously useful—information (e.g. the number of times an object has been placed on a table) is intended to provoke reflection from users on the possible intentions of these products and encourage exploration into possible uses and meanings. The unnecessarily high degrees of precision (e.g. milliseconds) and unrealistically large capacities (e.g. thousands of years) used for recording and displaying simple histories of use are intended to encourage reflection on the relationship between short- and long-term experience with the objects.

### **Amplifying the agency of objects**

We praise or chastise our products based on how they perform. Occasionally, we give a well-loved (or loathed) object a pet nickname. How might everyday objects amplify our perceptions of them as possessing agency—possibly even human-like thoughts or behaviors—in order to increase our attachment to these objects? In order to investigate this question, I am developing a series of products that have been redesigned to (mis)use their functionality to help express their needs and desires. Several of these *Animate Objects* are presented here.

The *Animate Chair* gets lonely when it hasn't been used in a while and begins to glow, enticing someone to sit in it. However, sitting in the chair for too long will cause it to become uncomfortable and to vibrate slightly and awkwardly. Will individuals give the chair the attention that it begs for or the space that it requests? Will its owner be willing to replace or dispose of the chair when she or he reflects on her or his relationship with the chair as an animate object?

The *Animate Lamp* tires and begins to dim its light bulb after it has been left on for a while. Jostling its shade causes it to startle and brighten. Gently rocking the lamp's shade comforts the lamp and causes lights woven within the shade itself to glow in aesthetic patterns. After a while, the lampshade lights gradually begin to dim, unless the shade is again gently rocked. The lamp will not grow tired and dim its light bulb if the lampshade lights are illuminated. To what extent will individuals treat the lamp harshly or lovingly? Will its owner dismiss the lamp as a functionally flawed or subversive object or will an intimate relationship develop between lamp and owner?



**Figure 3.** The Animate Clock occasionally grows bored with displaying the correct time and deviates by displaying an incorrect time.

The *Animate Clock* (figure 3) occasionally grows bored with showing the correct time and deviates by displaying an incorrect time. This deviation typically lasts only briefly and the clock returns to displaying the correct time. The clock briefly flashes a message—"HA HA"—to indicate it was only joking. Will individuals pay closer attention to the clock or lose trust in it? Will they empathize with it or otherwise relate to it personally?

The *Animate Objects* described here (i) encourage use of their functionality by means tangential to their core functionality (e.g., the chair uses aesthetic ambient lighting to encourage sitting), and (ii) inhibit use of their functionality by subverting their core functionality (e.g., the clock displays the incorrect time to create playful confusion). In doing so, the hope is that users will interpret and reflect on these objects as possessing human-like needs and desires rather than treating them as purely functional. Such reflection may cause more thoughtful and enjoyable everyday engagement with these objects, as well as more meaningful and enduring relationships to develop with them over time.

### Conclusion and Future Work

Current approaches to experience design often dismiss the material object itself, viewing it purely as a means toward an (experiential) end. In this paper, I have proposed a *material awareness* design approach, which emphasizes designing objects to reveal or present themselves to us in ways that encourage us to consider them more thoughtfully. Such an approach offers potential to both enhance our everyday experiences with things as well as promote more enduring and environmentally sustainable attachment to things. In the future, I plan to continue to develop this work, as I have begun to do in [7].

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