
Scale: Human Interactions with Broken and Discarded Technologies

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Abstract

Scale¹ is an interactive art project created from the detritus of broken and discarded technologies. When the audience steps on a repurposed scale in front of the installation, this not-so-broken world is set in motion, triggering odd functionalities, surprising connections, and sometimes eerie or troubling forms of beauty. Our project explores values and consequence of broken and obsolete technologies – and the human relationships we form them – that are often lost under functional and design-centered traditions of HCI research. This paper introduces the background, experience, and technical details of the project.

Author Keywords

Interactive Art; Broken; Repair; Repurpose

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous. See:
<http://www.acm.org/about/class/1998/>.

Introduction and Background

Scale is an interactive art installation comprised of broken and discarded technologies sourced from local landfills, recycling centers and junk shops. These

¹ <http://www.cornellhci.edu/scale>

"These things lives all around us – the toaster that toasts on one side, the abandoned reel-to-reel player left over when humans move on to new and different devices. Bereft of context and function and left to rust in attics, basements, and landfills, they provide the forgotten technological backdrop to our lives. But they also remain alive, filled with mysteries and secret languages, neglected talents and strange beauties. How are we to relate to this secret society of things? What values and qualities can we find in them (and in ourselves)? And what might that teach us about fear and wonder, imagination and care, in the mixed world of humans and objects?"

mundane and obsolete artifacts have been hacked, repaired, or repurposed by the installation team, connected through arduino sensors and processors, and reconfigured into larger combinations and assemblages reflecting the context and physical setting of the site.

As participants enter the site, they find strange and messy piles of broken, dark, and silent objects, fronted by an old digital scale under a single spotlight. When participants step on the scale, the scene comes to life: digital clocks race through an accelerating series of times, an old radio picks up random signals in its environment, electric calculators compute random numbers, and a variety of screens display text drawn

and distorted from web-based sources. Step off the scale, and the scene returns to silence (Figure 1).

Participants in past installations of Scale (ages 3 to 70) have reported experiences ranging from wonder, curiosity and nostalgia to boredom, concern, and 'creepiness'." Some stand on the scale for long periods of time, or step on and off repeatedly. Some avoid the scale altogether, and wait for others to trigger the installation. Others infer functions that may or may not exist. Most stay to talk about the installation afterwards. These conversations, with the creators and with each other, form part of the experience of the installation itself.



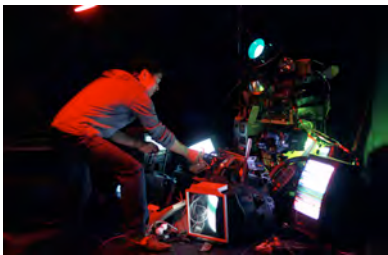
Figure 1. 'Scale' in both standby (left) and 'live' (right) versions.



Broken and obsolete items collected during the collection stage.



Playing and exploring the insides of broken technologies.



Assembling and configuring our collection of repurposed objects.

Scale is the product of an ongoing collaboration between visual artist Taezoo Park(<http://www.taezoo.com>), artist and engineer Laewoo Kang(<http://www.laewoo.com>), and technology researcher and theorist Steven J. Jackson(<http://sjackson.infosci.cornell.edu>). It brings together two separate but related streams of work: 'digital being,' a visual art project exploring the strange and formless creatures born from technological garbage; and 'broken,' an ongoing theoretical, ethnographic, and installation-based project that explores the hidden work and meaning of breakdown, maintenance, and repair in our ongoing engagements with the computational landscape around us. These efforts and Scale itself join a growing body of theoretical work in HCI [1,2,3] that explores the possibilities of richer and more complex relationships between humans and the object worlds around them (including beyond function, design, and use narrowly construed). More fundamentally, our collaboration builds from a shared sense of wonder and curiosity about the built world around us, and our conviction that there are depths and possibilities to our relationships with technology that we have not yet begun to understand.

Process

Finding and Collecting

More than 100 broken or obsolete devices including a reel-to-reel film projector and old typewriter were collected from local streets, second-hand stores, yard sales and occasional personal donations.

Playing and Exploring

After collecting, we began the process of exploring the items collected. Using diverse craft and repair tools

including hammers, precision screwdrivers, rotary cutters, we took objects apart, exploring inner workings and logics as well as aesthetics. In some cases, we just restore the original function that the device had. In others, the objects were altered or repurposed towards radically different ends. Still other objects struck us as beautiful and complete in present form, and we left them substantially alone.

Assembly and Configuration

After repairing and repurposing of each device, we install them in the site. This process was not simply about placing artifacts according to some obvious or pre-ordained order. Instead, it depended on the improvisational mixing and matching of objects that, in combination and through juxtaposition, produced particular aesthetic or functional connections and effects that we decided we liked. It was both cumulative and collaborative, and was driven substantially by the materials at hand. For example, one artist piled up a certain part of the installation with a collection of old and analogue technologies, including an old film projector and photo enlarger. Once assembled, another member suggested adding both digital and analog clocks hanging on the top to create a juxtaposition of time and nostalgia in hopes of creating the feeling of forgotten items under the strain of time.

Technical Details and Floor Plan

A FSR (Force Sensitive Resistor, 0.5" diameter) is attached inside of the scale in order to detect the human weight. This sensor data is processed and analyzed using Arduino, an open-source hardware platform, and a signal is transmitted to the other devices in the network. We also use Xbee wireless platform to avoid complicated and dangerous high



Example of juxtaposition in assembling stage; creating the feeling of forgotten time by adding analog and digital clocks in old and analogue technologies



A scale is hacked for detecting human weigh and sending trigger signal to all electronics in the installation wirelessly.

voltage wiring as well as to protect from the overload of single AC outlet power. Diverse electrical components like LEDs, motors, different Arduino shield (tellymate, relay-shield) are utilized for repurposed functions. Although the final scene of this installation is usually

created as improvisational and site-specific way, it usually needs more than 150 square feet space. The light should be dim or dark for expected light tone of the installation. The current version of the installation requires approximately 2000 Watt in AC 110V.



Figure 2: Time-lapse of Assembling and Configuration stage.

Future Works

Scale is part of a larger program of work in HCI design and theory that seeks to deploy ethnographic, design and interactive art practices as means of exploring philosophical propositions around the nature of human-computer relations (and human-object relations more generally). Future and ongoing projects will continue this program of work, seeking to add new, creative and sometimes playful or speculative forms of collaboration and material engagement to existing bodies of HCI theory, method, and public engagement.

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