Dewy: A Condensation Display

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Abstract

This sketch presents Dewy, a display surface of ‘pixelized’ condensation, creating images, patterns and text out of the process of the physical state change of water. Dewy works like a spatially controlled fogged window, one that can communicate back to you, conveying information through a slow and subtle means. In developing Dewy, we have been motivated by an aversion to the ‘visual pollution’ of many existing systems of public media display and seek to create an alternative method of display which references natural processes and can blend seamlessly in its materiality into varying environments.

1 Introduction

New interactive display technologies such as large scale plasma screens and LED billboards are becoming more and more prevalent as elements embedded in our public spaces. Much of this media often overpowers an environment, visibly ‘loud’ and with a brute force quality clashing with existing architectural and natural characteristics of a space. Such technologies are changing our urban landscape and embedding a layer of digital infrastructure into our architecture, a phenomenon aptly named by Paul Virilio as ‘electronic gothic’[1].

While technological elements embedded in our environments allow us to gain information and forge richer connections with our surroundings, we believe the means of expression can be embodied with alternate materiality and temporality, especially as new technological developments in varied industries (modularized electronics, smart materials, wireless infrastructures), have provided media developers with a new range of design tools. This sketch presents Dewy, one such alternative display technology. Inspired by the natural interaction of physical state change cycles of water and the simplicity and subtle beauty of Hans Haacke’s 1963 Condensation Cube [2], Dewy is a display surface of ‘pixelized’ condensation, working like a spatially controlled fogged window, one that can communicate back to you with words and patterns. Slow and subtle in behavior, Dewy utilizes a materiality and temporality reminiscent of many natural environmental processes, and attempts to challenge, or create an alternative, to the visual pollution of existing systems of public media display.

2 Implementation

In its current form, Dewy consists of an 3x5 array of 300mm peltier junctions, thermoelectric devices for heating or cooling, mounted to the back of a steel surface. The front of the steel is covered with a damp layer of felt and a sheet of clear acrylic rests one inch above. When a peltier junction is turned on to heat the surface of the steel, the moisture in the felt begins to evaporate, and is then cooled by the surrounding air, causing a small area of condensation to form on the acrylic above. The system is run by an Arduino board connected to a series of multiplexer chips (74AHC164) which sequence to quadruple half-H Drivers (L293) used to control the peltiers. A fan at the base of the piece can also be activated as part of the sequence, creating airflow which ‘erases’ the condensation patterns, clearing the display. The 3x5 matrix allows us to create single letters, in addition to abstract animations. The system can be easily scaled up to create a much larger matrix offering higher resolution. Heat wire could also be used as an alternative to the peltiers, and a system of water flow control to keep the felt consistently moist. will be our next improvement.

3 Discussion and Implications

When Dewy was installed at a recent exhibition, we often observed visitors wanting to interact with Dewy, attempting to incorporate their own breath into changing the sequence. We were very encouraged by this behavior, as most displays don’t invite natural interaction and see incorporating a form of interactivity as a logical next step. Also, we observed that the design is sensitive to environmental conditions, such as unplanned spots of condensation a logical next step. Also, we observed that the design is sensitive to environmental conditions, such as unplanned spots of condensation on a particularly humid day. While this can be seen as interference, we view it as something to take advantage of, allowing the system to visualize existing environmental conditions and perhaps incorporate these changes as feedback into the system’s behavior, creating a dialogue between the state of nature and our intended digital control. The natural rise of ideas such as these, we believe demonstrates Dewy’s contribution to an emerging discussion on alternative materiality in spatial media design.

References
