Chapter 9

FROM CONCEPTION TO DESIGN
A practical guide to designing ambient displays

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Abstract: This chapter discusses displays that sit on the periphery of a user’s attention. Many public displays of information that we encounter are in this category the majority of the time, including clocks, posters, and windows. Computationally enhanced variations on this theme are called peripheral displays. Our work focuses on ambient displays, a subset of peripheral displays that continuously display information to be monitored. Peripheral (and ambient) displays have the peculiar property that they are not meant to be the focus of the user’s attention. Contrast this with desktop applications, which require a user’s attention. In this chapter, we present a case study of two public ambient displays that we developed and evaluated. We present some lessons learned about the design of ambient displays, and conclude with a practical guide to using a modified version of heuristic evaluation that we developed as a result of designing these displays.

Key words: ambient displays, peripheral displays, heuristic evaluation, attention, iterative design

1. Introduction

Many of the public displays of information that we encounter sit on the periphery of a user’s attention the majority of the time, including clocks, posters, and windows. Computationally enhanced variations on this theme are called peripheral displays. This chapter is concerned with ambient displays, a subset of peripheral displays that continuously display information that can be monitored by the user without requiring her focused attention. For example, one of the first such displays, created by an artist and technologist in collaboration, was a “dangling string” attached to a motor
(Weiser and Brown, 1996). The string spun around at different speeds depending on network load (See Figure 9-1). Contrast this with a discrete display of information such as an alarm, an alerting display that only rings when the network load reaches a certain threshold.

Peripheral displays have the peculiar property that they are not meant to be the focus of a user’s attention. They can be broken into two categories: Ambient displays, are a subclass of peripheral displays that present information in such a way so as to allow people to monitor a data source while not being distracted from their main task. Alerting displays alert a user through more direct means about salient information. This chapter will focus in particular on ambient displays. However, many alerting displays include an ambient component when they are not actively alerting the user about something, and thus alerting display designers may benefit from some of the material in this chapter. Similarly, an ambient display may at times alert a user about something.

One of the biggest challenges facing the developers of ambient displays is the lack of information about what constitutes a good design, and which ambient display designs will succeed or fail. Considering the literature regarding ambient displays, there have been few in-depth evaluations, and even fewer examples of design iteration (exceptions are the