

# CounterActive: An Interactive Cookbook for the Kitchen Counter

Wendy Ju, Rebecca Hurwitz, Tilke Judd, and Bonny Lee

MIT Media Lab, Personal Information Architecture Group

Cambridge, MA 02139 USA

{wendyju, beckyh, tjudd, bmlee}@media.mit.edu

## ABSTRACT

We introduce *CounterActive*, an interactive kitchen cookbook that teaches people to cook. After describing the interactive system and the multimedia recipe schema, we discuss results of early user test and evaluation.

## Keywords

interactive environments, projection, electric field sensing, RFID tags, recipes, cooking, user adaptability

## INTRODUCTION

The progress of computer technology into everyday consumer appliances makes possible new applications that interact with people in their very own homes, helping them complete everyday tasks and acquire new skills. The *CounterActive* kitchen counter is designed to entice people to explore cooking and help them prepare food.

*CounterActive* is built around the metaphor of a cookbook embedded in the kitchen counter. Like a cookbook, *CounterActive* provides instructions and pictures showing how to cook various recipes, but has the capability to provide movies, music and help on demand too. *CounterActive* also brings the liveliness and adventure of cooking shows out of the living room and into the kitchen where people actually cook. By navigating the projected interface, pressing on words or highlighted “hotspots,” users can get instructions and supporting multimedia content, put together their favorite dish, step through recipes at their own pace—all in the same space.

The strong point of the *CounterActive* system—the underlying principle that drove our design process—is that users are *not* cooking with computers. They are cooking on the kitchen counter with their kitchen implements, just as they’ve always done; it is just that the counter and implements are more helpful.

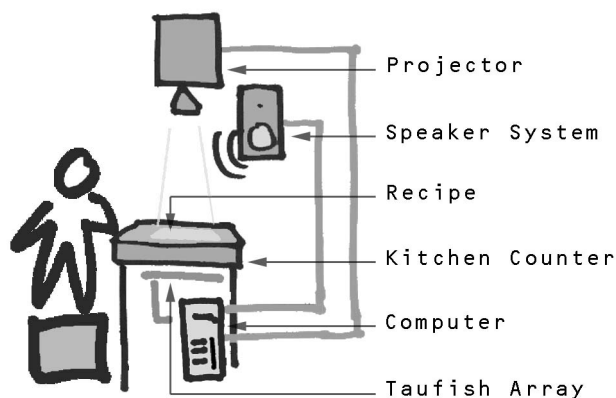


Figure 1: Diagram of the CounterActive System

## THE COUNTERACTIVE SYSTEM

The main components of *CounterActive* are a computer, a projector, an electric field sensing array, and a speaker system. This setup was originally inherited from the Interactive Table. [1] The visual display is projected onto the kitchen counter to create a 28” x 20” interactive space on the existing countertop that is impervious to the spills or messes that are inherent to cooking. We use Rehmi Post’s Taufish electric field sensing array and Matthew Hancher’s Filament board to eliminate the mouse and keyboard; users interact with the system by touching the counter itself.

Since food items are likely to be sold with electronic ID tags [2] instead of bar codes in the near future, we are currently developing technology that enables the counter to see tagged items. This will allow us to track ingredients over the *CounterActive* counter, and to create tagged tangible tools that cross the digital divide, such as rubber spatulas that can detect whether the user is mixing instead of folding, and lets that user know the difference.

The underlying theme of the system design is that the interface should closely match the application, so that users are kept focused on the task of cooking and not on using the cooking tool. [3]

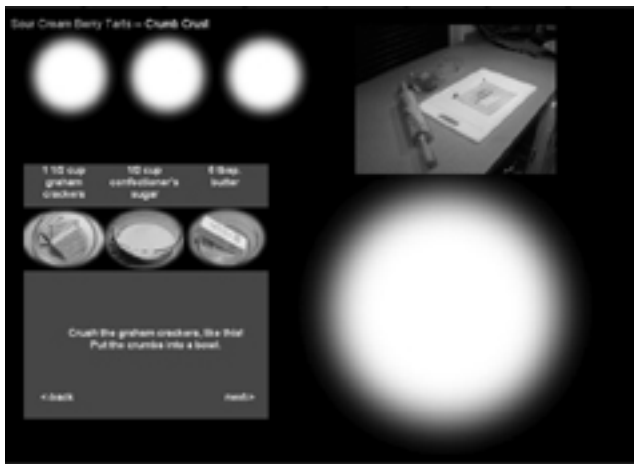


Figure 2: Screenshot of Sour Cream Berry Tarts recipe

### THE COUNTERACTIVE COOKBOOK

The *CounterActive* cookbook consists of Dynamic HTML recipe pages which are viewed in a web browser. However, we specifically avoided designing the recipes like web pages--in fact, we do not use windows, icons, menus or pointers at all—to differentiate the experience of using the kitchen to cook from the experience of using a computer.

The spatial layout of each recipe includes interaction, video and work areas. The interaction area is where users interact with the counter by touching written instructions and relevant pictures. The video area presents pictures, instructional videos, and entertaining movies relating to the recipe. The work area is where the user prepares the food. We used visual cues such as color backgrounds and spotlights to differentiate the separate areas. Sound is incorporated throughout the user experience to provide instruction, feedback and ambiance.

We have developed four recipes for the *CounterActive* cookbook to date. The kids' recipes—Sour Cream Berry Tarts and Banana Bread—were chosen because the recipes involve safe tools, and the instructions and procedures are simple and fun. In contrast, South of the Border and French Getaway are menus of several dishes with an adventurous common theme.

### USER TESTING

We have begun conducting user tests to verify the counter's design and to obtain ideas for future designs. So far, we have had two children, ages 10 and 7, each complete one of our kids' recipes. Each session took two hours with the pre-cooking and post-cooking interviews.

These preliminary tests reinforced the principles that had guided the cookbook design. Visual cues proved to be effective in choreographing movement. Both kids prepared food in the spot-lit areas and left the colored-blocked interaction areas clear without being told to. Both relied heavily on the videos to demonstrate actions, and played each multiple times; they also pointedly requested more

videos in the post-interview. Pictures were taken very literally; because the eggs were shown in a small dish, the child first place the whole egg into a small bowl only to crack them into the larger bowl moments later.

The tests also revealed shortcomings in the current design. If we put multiple steps on a page, or multiple actions in one instruction, the children would sometimes inadvertently move on to the next step before finishing a task. Also, the kids were often unsure whether they had finished a task and would often hesitate until encouraged to proceed. Finally, when one child could not see instructional pictures because the large mixing bowl obstructed her view, we were reminded that different users require different counter designs.

User tests will continue to be a critical part of the ongoing design process. In particular we want to explore the role of entertainment in the cooking process. We are also interested in seeing some testers again to see if we note improvements in their cooking ability with repeated use of the *CounterActive* counter.

### EVALUATION

Though *CounterActive* is a work in progress, we feel that it embodies desirable qualities of interactive environments as laid out by Cooperstock, et al. [4] *CounterActive* is “invisible” because the user is focused on the task above the counter rather than on the interface itself. It allows the user to control the pace of the process, and to get information when he or she need it. Feedback is provided through sounds and changes in the interface.

The user testing suggests, however, that to really teach cooking and provide adaptability, the *CounterActive* system needs to detect the users actions. To this end, we will be using tagging technology to monitor tools and ingredients as users cook.

All in all, *CounterActive* illustrates how the appropriate mapping of layout, progression, feedback, style and context to the needs, tasks and actions of the user are critical in the design of interfaces for interactive environments in general.

### ACKNOWLEDGMENTS

Many thanks to Professor Mike Hawley, all our fellow researchers in Counter Intelligence and Personal Information Architecture, Rehmi Post, Matthew Reynolds, and Jofish Kaye for their ongoing help and support.

### REFERENCES

1. Omojola, O. et al. An installation of interactive furniture. *IBM Systems Journal* 39, 3/4 (Fall 2000), 861-879.
2. Want, R., Fishkin, P., Gujar, A., Harrison, B. Bridging Physical and Virtual Worlds with Electronic Tags. *CHI '99* (Pittsburgh PA, May 1999) ACM Press, 370-377.
3. Nielsen, J. Noncommand User Interfaces. *Commun. ACM* 36, 4, (1993) 82-99.
4. Cooperstock, J.R., Fels, S., Buxton, W., Smith, K. Reactive Environments. *Commun. ACM* 40, 9 (1997) 65-73.