# Building Bowls for Miscellaneous Media

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## INTRODUCTION

In this paper, we describe an early design sketch of an augmented bowl. The sketch illustrates how a bowl's physical properties might be used to enable a simple, lightweight method for casually displaying and containing the media held on devices like digital cameras (still and video), mobile phones, music players, etc.

The features we present of the augmented bowl have been designed to exploit our commonsense understandings and everyday uses of container-like objects. As we'll explain, in choosing the features, we've attempted to build on the ways in which physical content can be casually added to or retrieved from a bowl with little to no thought. We've also tried to capture the way bowls loosely contain their physical content, so as to enable an informal and to-hand solution for managing digital media.

The underlying motivation for this work has been to explore innovative methods for displaying and handling digital media, something we feel to be timely given the nascent proliferation of capture and playback devices. Given this proliferation, our intention has been to move beyond the constraints of the personal computer (PC) and consider the possibilities that might exist for using alternative display technologies and physical methods of interaction [see 3].

### Beyond the PC

Our ideas for the augmented bowl, as one possible avenue for this research, arose from our ongoing empirical investigations into home life. One possibly unsurprising discovery we've made in this work is that household members, in their day-to-day routines, often devise simple, easy-to-use techniques for managing their physical 'stuff' [1, 5, 6]. Our bills and correspondence are loosely collected into piles, piles distributed around the home. Bowls and drawers become to-hand containers for bits and pieces that have yet to be sorted or that aren't quite ready to be thrown out. Indeed, we might argue that such ordinary practices are an essential feature of homes and what we do to make them special— transforming the mundane or possibly profane to sacred [2]. Thus, at times, it would seem that in our daily dealings with stuff we simply want easy-to-hand places to put things that casually and informally organize. A key feature to these places is that they require minimal effort to use—they're

not about engagement, but rather disengagement. Thus we find these piles, bowls, drawers and so on situated around the home, purposed, as it were, for us to make use of them.

What has become the established PC-centric model of handling digital media contrasts with these types of minimal effort practices and casual forms of storage. The PC's ability to perform a range of activities related to storage, organization *and* manipulation demands a level of complexity that makes it unwieldy and thus difficult to incorporate into everyday routines. The convergence of features into a single 'solution' makes what should be straightforward operations complicated to perform. Because of this complexity, there exists no casual way to simply contain or store digital media—no parallel to the way in which an object is simply placed in a bowl or drawer and minimally organized by dint of its size and when it was placed there. There is an in-built formality to both containing (or 'uploading') content and organizing it that is manifestly not the case with physical containers. Because of this, the PC is more suited to the more formal storage and organization of content that requires highly focused interaction or engagement, the sorts of activities that are often put off in the home for more time-bounded and infrequent occasions.

### Digital media containers

Our sketch of the augmented bowl has been undertaken in an effort to contemplate this apparent problem and consider the practical design issues. Broadly, the aim here has been to support the casual and informal organization of digital media by providing lightweight methods of interaction that are highly intelligible to the user. Our focus thus far has been on augmenting physical bowls, building on the particular functions they afford.

The current design 'sketch' is based around a semi-transparent bowl capable of holding digital and physical content. As devices such as cell phones and digital cameras are placed into the bowl, the digital content stored on them is copied and displayed. Using two data projectors, the content is displayed on the sides of the bowl's semi-transparent surfaces. As more content is added, so existing items fall deeper to the bottom. The bowl therefore becomes a place into which digital content can be easily copied, previewed or deleted, in a casual or informal manner.
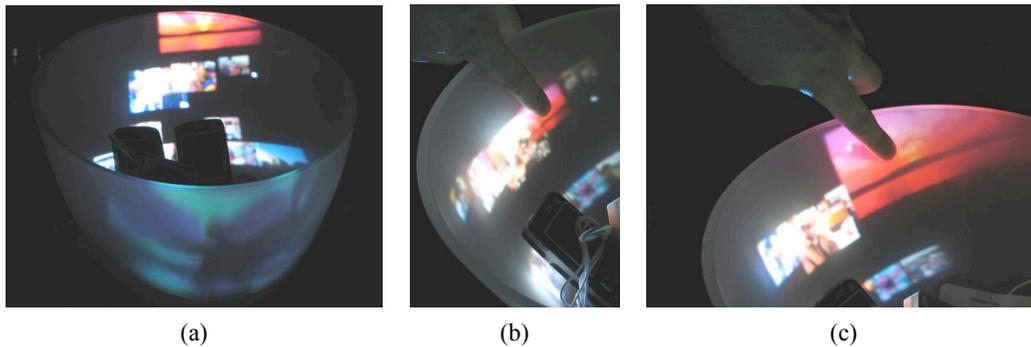
<div align="center">(a)        (b)        (c)</div>

**Figure 1.** Augmented bowl.

## AN AUGMENTED BOWL

The current manifestation of our bowl is shown in Figure 1a. By no means a finished article and yet to be touch-enabled, this early mockup is intended to inspire our future design work, in particular allowing us to rethink how media can be managed in easier and more lightweight ways. In the following we discuss some of the specific interactions that such a bowl might support, how these can provide utility in the digital domain, and how we believe these link back to our established practices in the physical world.

### Containment

In conceiving of a digital media container, we have chosen to preserve the physical properties of a bowl in order to exploit the visual cues that bowls exhibit. A bowl's shaped surface—its *sidedness*—indicates that it will bring together objects; that it will *contain*. The bowl's visible form affords its use in this respect. Using our envisaged system, the containment of digital media is achieved by placing a digital device in the bowl. The media associated with a device is projected around it, on the bowl's glass surface. Digital containment is thus achieved by further utilizing the physical properties of the bowl; it is accomplished through the simple act of placing a device in the bowl.

### Layering

Using the described bowl, we're aware that some of the media displayed may get obscured as more physical and digital items are added. We consider this, however, to be an intelligible feature because of the well-established understandings we have of physical bowls. With a conventional bowl, as items are placed in it, other content is obscured. To view lower lying items, we know that the top layers must be sifted through, moved apart or removed. Indeed, we exploit this principle of layering when we wish to let objects lie hidden and out of sight. Thus, our intention is that this interactional feature should hold true for the augmented bowl.

### Detaching content

Our proposed method for detaching media from its associated device has also been chosen in an effort to maintain the principle of layering. We envisage content being 'peeled' away from its device and left on the top 'digital' layer until obscured by other content. To detach the media, a device's thumbnails or icons are held down in the bowl with a finger as the device is pulled away (Fig. 1b). Providing visual feedback, media is temporarily stretched to imitate a peeling-like action. This action duplicates the media in the bowl, leaving the original content on the device.

### Signaling attention

In apparent conflict with their limited display capabilities, we find that bowls are sometimes used to draw attention to their content. Apparent here is that a bowl is *not* being utilized for its ability to display its content. Rather, we attract attention to content by the way we place it in relation to the bowl; by putting something out of kilter in a bowl, it stands as a reminder of something to take with you, put away, or otherwise act upon because it has been placed, figuratively speaking, to trip over. The mechanism builds on the at-a-glance quality that physical bowls can have when they are situated in the home, on hallway sideboards or kitchen counters, for instance.

Our augmented bowl supports this idea of signaling attention by allowing media to be dragged up and against the bowl's side. Using this feature, chosen media can be visually distinguished from low-lying contents. For example, a picture or possibly an address from a mobile phone can be moved up to one of the sides of the bowl to mark it out for a passer-by to see. We have attempted to further develop this feature by building on the specific properties of the bowl. If media is dragged to the topside of the bowl (Fig. 1c), the increase in size of a thumbnail or icon is more pronounced. Thus, given the orientation of the bowl's topside (facing outwards), media left there is made visible from a distance. We have also made media placed in this section visibly brighter, adding to its visual prominence.

### Surface ecologies

Arguably, other augmented surfaces, such as tabletops and walls, offer a technically more feasible solution to the problem of digital media containment and storage. The difficulty involved in projecting onto and detecting interactions with tabletops and walls has been subject to extensive research. Indeed, a number of systems have been presented in the research literature that provide possible solutions to containment and viable techniques for interacting with digital content [eg 7]. At issue here, however, are the distinctive properties of surfaces and the different interactions they

afford in settings like the home. What is evident from our observations is that tables and walls do not lend themselves to the same types of containment and storage functions afforded by bowls and other container-like objects.

This point is best illustrated by example. Consider how horizontal surfaces such as tables play into the patterns of home life. As we and others have observed [1], tables are ideally suited to the display and organization of materials, sometimes in shared environments. The physical nature of the table, for example, lends itself to having content spread over it and people arranged around it for the purposes of sorting, organizing, viewing, playing, eating and so on. Usage is thus driven by bounded activities, something that appears all the more pertinent in the home where table-use is regulated by a household's daily rhythms and negotiated by its members. Any containment afforded by tables is consequently constrained by who and what has overall rights to the table. The table has a social as well as physical character in the home that means any storage is time limited and bound by an established social order.

A sensitivity to the actions and activities afforded by table-tops, walls, containers, etc. gives an indication of how bowls might operate within the larger environment. In essence, bowls can be seen to be part of a wider ecology of surfaces in the home. This notion of surface ecologies [also see 3]—of different surfaces working together and sometimes competing—stands in contrast to the multi-purpose solution of the PC, where an effort is focused on centralizing virtually all operations. Instead, we offer the basis for a solution that should be used only under certain conditions, with a constrained range of operations working in concert with the physical and social surroundings.

Our main assertion here is that an augmented bowl should retain its specialized containment and storage functionalities. The casual ways in which items can be literally tossed into bowls and the loose organization that results from the physical form of the bowl should be preserved because this appears to be one of the reasons why it is so compelling as a storage container. The design space then becomes one of considering how the bowl works in coordination with the surfaces around it. We propose, for example, that to organize its content more thoroughly, a bowl's media might be 'poured' onto and spread over an interactive tabletop. Similarly, media items might be virtually 'stuck' or 'thrown' from bowl to wall displays to view content collaboratively.

## CONCLUSION

The augmented bowl concept we have presented in this paper is designed to support the need that we sometimes have to effortlessly handle things. As a design sketch, it hopefully provides an idea of how computational resources might be exploited to build on our intimate familiarity with the physical, and done so with a sensitivity to the ways in which our social arrangements imbricate with material surroundings. As opposed to an all-encompassing solution for managing digital media, the bowl is envisaged to be one of

several resources that operates within a larger ecology of purpose-built solutions.

As intended, the presented work has raised a host of questions about digital media containment and possible solutions that address real-world practices in homes. For instance, the mapping of physical 'stuff' onto digital media is clearly not a direct one. Further, thought needs to be given to the sorts of digital media that might take on physical-like qualities and consequently what media should and should not be displayed in containers like the augmented bowl we describe. Questions are also raised about the literalness of our interpretations in designing the augmented bowl. Is such a literal translation of physical containers necessary? Also, do such tangible interfaces merely limit our potential, while failing to introduce novel and possibly more appealing methods of engaging with our everyday experiences? Why too should our interactions with digital media be constrained by the properties of the physical world when clearly they do not have to?

As we develop this work and progress towards a fully functioning prototype of the augmented bowl, we hope to address these questions as well as the more technical problems. The position we take, here, is that detailed studies of established, real-world practices provide a powerful resource in incremental design. This approach is best complimented, however, with *in situ* prototyping where people's everyday interactions with a solution can be used to help develop potentially more novel, but still grounded design ideas.

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