

Jetsam: Exposing our Everyday Discarded Objects

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ABSTRACT

There is more to our urban lives than precision location systems, restaurant recommendations, and familiar desktop applications redeployed mobile phones. While many of these tools will indeed become vital urban necessities that improve our lives, we are left to wonder the role of technology in touching the other more emotional aspects of urban living. In concert with our urban productivity tools, we envision the existence of a wider range of new urban objects that broaden our perspectives on technology and promote our personal and collective wonderment of place, people, and life. Using of the Urban Probes [1] research methodology of deep bodystorming, intervention, interviews, and artifact production, we demonstrate the deconstruction and novel physical rethinking of technology surrounding a ubiquitous urban object – the public trashcan.

INTRODUCTION

Urban life is largely composed of the movement, activities and familiar patterns of people within and across our urban landscapes. There is also a curiosity, perhaps even verging on a voyeuristic interest in the lives and traces of our fellow urban neighbors. As we traverse our city we share time and space with others. As we idle awaiting a bus, or navigate to our local café, we encounter others and the traces of their passing. Often unconsciously we create fictitious stories about the lives of these people. It is this creative wondering that is the inspiration for *Jetsam* – the result of an Urban Probe focused on public city trashcans.

Just as an archeologist excavates layers of debris from past civilizations to inform histories of ancient civilizations, so too can the discarded artifacts of today's urban inhabitants be used to create the rich milieu of everyday stories of urban life. The Garbology Project [2] has been measuring urban trends over the past 30 years by excavating and evaluating over 150 tons of trash across American cities. On a smaller time scale, we can observe patterns by extracting the secondary traces that are left behind by the flows of urban inhabitants – the archaeology of public trash.

As urban places are traversed, used, experienced, and neglected, a pattern or trace of trash is created on the landscape. What does the type and/or amount of trash say about a place and the people that frequent (or neglect) it? Can new urban computing technologies influence trash accumulation, collection, awareness? Can we observe and interpret patterns of usage perhaps near a public city

trashcan that can reveal a larger story of the place and people that inhabit and traverse it? We explore these questions in the development of *Jetsam*, an interactive public trashcan.

Goals

Our goal is not to provide general purpose holistic solutions to problems within the complex social, cultural, political, and economic ecology of urban life. Rather, we hope to merely expand the vocabulary of potential urban technologies, enabling a wider range of choices as we form our future urban lifestyles. Our final designs are intended to provoke open ended discussions around urban technologies rather than present “killer apps” or final solutions.

Jetsam: An Urban Probe

Inspired by a series of Urban Probe studies which have been documented previously [1], we constructed a fully functional augmented trashcan called *Jetsam* (Figures 1 and 2). The augmented rubbish bin exposes city dwellers to the pattern of trash interactions as told from the point of view of a single city trashcan. Two event types can be sensed: interaction events and trash in/out events (including the type of trash involved). We used a simple IR photoelectrical switch to detect a basic interaction with the trashcan such as tossing trash in, removing trash, or simply searching through the trash – all activities we observed in everyday urban trashcans. A sensitive electronic scale determines the current weight of trash entering or leaving the bin. Mounted within the trashcan, an overhead camera records the top layer of trash in the bin. A laptop computer connects the devices and projects an appropriate visualization from the trashcan's opening onto the city street.

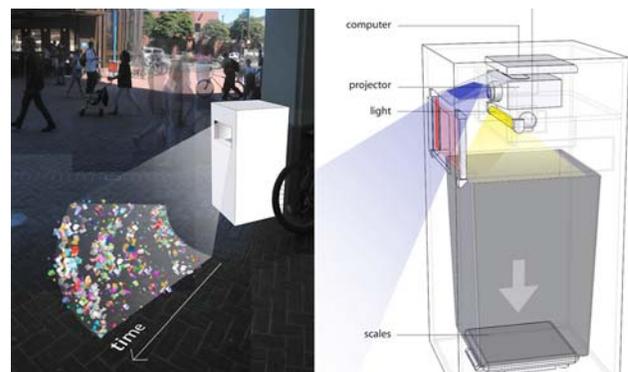


Figure 1: Architecture of *Jetsam*, the Augmented Trashcan

Experience

There are several methods of interaction with the augmented trashcan: *active*, *passive*, and *mobile*.

Tossing trash into or removing trash from the augmented trashcan is an *active* interaction. For example, after finishing his lunch while sitting on a nearby bench, Paxton tosses his bag of trash away. The augmented trashcan detects the event as the item enters the bin. Using the camera and digital scale, information about the new trash is logged. Its weight is measured and a rough image of the trash is extracted by subtracting out the previous image of the top of the trash from the current. The isolated image of the trash, its time, and weight are all logged. After a short time, an image of the individual item is introduced into the animated, projected visualization.

Any individual passing near the augmented trashcan interacts *passively* with it by observing its shifting visualization. Mounted inside the trashcan, a projector renders a view of the recent activity of the trashcan over time. Recall that an overhead internal camera captures an image of each piece of trash. This image is incorporated into a continuously projected visualization on the ground in front of the trashcan. Recent items appear closer to the base of the trashcan and slowly “orbit” outward over time. Each trash image also rotates on its axis based on its weight with heavy items spinning slowly and light items more quickly.

As time elapses, the orbiting “trash images” slowly progress outward, away from the trashcan eventually disappearing completely. The resulting visualization depicts a layering of trashcan activities and patterns, not unlike the archeological layers typically found during years of drought or significant change.

Will the lunch trash layer reveal itself? People passing nearby will be able to glance at the augmented trashcan’s visualization, noticing a familiar or unusual ebb and flow of trash within a local area of the city. The completed and fully functional augmented trashcan in action can be seen in Figure 2.



Figure 2: Completed and deployed *Jetsam* Trashcan

Envisioned Scenarios

A few very simple envisioned scenarios: Spike in subway tickets – people have recently arrived here from elsewhere; large quantities of burger containers – nearby fast food restaurant appears popular; unusually few Starbucks cups – people are frequenting another nearby café; more blue lottery tickets than yesterday – nearby people are risk takers, dreamers, or foolish; a green plastic doll – why did this boy or girl discard that and what are they like?

Mobile Experience

We also envision several possible *mobile* phone interactions with the augmented trashcan. One such simple interaction allows an individual to send an SMS text message to the trashcan. The actual sent text, perhaps a comment on a piece of trash in the visualization, can be integrated into the visualization as a form of street trash poetry. Secondly, such users are “rewarded” for active participation by being sent back a higher resolution image of a recent piece of trash or interesting statistics.

Realistically, we have no grand visions of people documenting and obsessively checking on their local augmented trashcan and its contents with their mobile phone. However, we do believe that systems such as *Jetsam* can enable visualizations of urban flows and prompt further reflection and wonderment of urban life. Even a limited form of the mobile phone interaction may spawn individuals to create fanciful urban stories, improved views of their city, and a richer feeling of belonging within the urban entropy. Recent “Google-Mashups” attest to this fascination with urban trash [3].

CONCLUSION

The very essence of place and community are being redefined by personal wireless digital tools and mobile devices that transcend traditional physical constraints of time and space. New metaphors for visualizing, interacting, and interpreting the real-time ebb and flow of urban spaces are certain to emerge. Without a concerted effort to develop a deeper understanding of the implications of emerging technologies on our urban landscape, computer and social scientists, city planners, architects, and others run the risk of losing touch with the reality of our urban streets and their inhabitants. The Urban Probes research methodology and examples such as *Jetsam* provide a new mechanism for exploring, deconstructing, and building our urban landscapes as well as empowering city dwellers to participate in the construction of their emerging digital city landscape.

REFERENCES

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