
MugShots: Everyday Objects as Social Catalysts

Hsin-Liu Cindy Kao

MIT Media Lab
75 Amherst Street
cindykao@media.mit.edu

Chris Schmandt

MIT Media Lab
75 Amherst Street
geek@media.mit.edu

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Abstract

We explore how everyday objects can serve as *social catalysts* to increase social interaction in the workplace. As an initial exploration, we created *MugShots*, a coffee mug with a wireless OLED display. Users can wirelessly transmit images onto the mug, revealing different self-identities through an everyday object, in turn triggering interest and conversation with others. We present a prototype of *MugShots* along with a 10 person pilot study to gauge the feasibility of this idea.

Author Keywords

Social Catalyst, Computer Mediated Communication

ACM Classification Keywords

H.5.3 Group and Organization Interfaces

Introduction

Several projects have focused on increasing workers' awareness of activities and other colleagues in a workplace [1] with the assumption that this would lead to an increase in informal interaction, which in turn would foster innovation [2]. Previous approaches have introduced new technologies into the workplace, including situating audio-video links as in media spaces [3], creating 3D virtual worlds [4], or leveraging sensor-laden devices with communicative qualities [5].



Figure 1. Envisioned *MugShots* appearance. (Electronics, including WiFi, are embedded in the bottom of the mug)

We explore leveraging *existing* objects in the workplace to enhance social interactions. Instead of situating a new technology that requires adoption, this work embeds communication properties into an object of familiarity and existing utility – the coffee mug. Mugs are not only mobile objects carried along by its owner, but also, through the choice of a certain mug, the owner may also signal [6] something about herself. *MugShots* enables users to display self-selected images through an OLED (organic light-emitting diode) display embedded in the mug surface, exploring how *MugShots* may serve as a social catalyst [7] to trigger conversation and rapport as they are carried around in public spaces (i.e., coffee break areas or meetings).

We envisioned *MugShots* as shown in Fig. 1. It is composed of a flexible OLED wrapped around a mug body, with the ability to show high quality images. The transferring of images is done through wireless communication. However as we will discuss later in the paper, the current display technology limited the design of our prototype.

The Mug as Social Catalyst

How can we create opportunities for social interaction? *Social catalysts*, the term coined by Karahalios & Donath [7], are objects or events that stimulate mutual involvement for people to engage in conversation. For example, when people bring their pets to public places, the pet often become a *catalyst*, inviting conversation from strangers.

We explore using the mug as a social catalyst due to (1) its mobility, and (2) its known role for signaling personal qualities. The mug is an object we drink from daily and place next to us when we work. Yet we also take it to public areas (i.e., coffee break areas) where

we engage in social interaction with colleagues. Its mobility creates opportunity for it to serve as a *stimulator* for social interactions.

Moreover, as our clothing and accessories may serve as *extensions of self-identity*, the mugs we choose also reveal qualities about ourselves. Social signaling theory [6] states that we form an impression for and of others based on the commodities we own. *MugShots* builds upon this notion, allowing the user to designate, and even alternate the signal they wish to broadcast to the world by selecting and editing the images displayed on the mug. A smiley face may reveal a positive mood, while a rock-climbing photo may reveal one's interests.

Through these self-expressive signals, we explore how the mug may *invite* the interests of others to start a conversation. The mug facilitates a communication *pull* from the audience by seeding a conversation topic though the display.

Scenario

To elucidate the functionality of *MugShots*, it is easiest to introduce it through a scenario:

"It is a rainy Monday morning after a holiday break. Julia arrives in her office at 8am, and quickly checks her email for updates from her boss. Seeing the list of tasks ahead of her, she yawns and decides to get some coffee. Looking at her coffee mug and overwhelmed with Monday blues, she selects a picture of a sleeping puppy from her phone and wirelessly transmits it onto the mug to reflect her mood. Walking into the coffee area, she sees a few people from the team one floor above her. As their workspaces do not overlap, they are only nodding acquaintances. A few people notice the puppy on Julia's mug, and comment on how they

Figure 3: *MugShots* current prototype

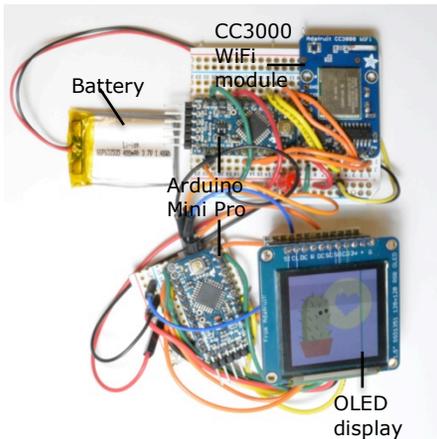
wish they could all get more shut-eye. They have a good laugh and briefly chat about their coming day.

Feeling energized after a morning's work, Julia, an avid hiker, decides to switch the image on her mug to beautiful scenery from her trip to Death Valley. After lunch, she walks into the coffee area to fill her mug. There, she bumps into Claire, a previous collaborator. Out of curiosity, Clair asks her about the image on her mug. They are both thrilled to learn that they share a love for desert hiking. This personal detail never came up until this spontaneous encounter."

The scenario presents possibilities to how *MugShots* may not only trigger conversations between strangers, but also enhance the depth and quality of conversations between acquaintances.

Prototype

We have built a functional prototype to explore the feasibility of this idea (Fig 3). In the current prototype, the users can select images from a web UI and wirelessly transmit the image to the OLED display. Since flexible displays are not yet commercially available, we used a small rigid OLED display for this proof-of-concept prototype. The hardware consists of: 1) an Adafruit 1.5" OLED 2) CC3000 Wi-Fi module, and 3) Arduino¹ central processors, as displayed in Fig. 4. The OLED is 128X128 pixels and has a built-in SD card. The mug body was modeled in Rhino² and fabricated in the MakerBot 3D printer³. The fabricated mug took the size of a typical coffee mug, with 4.5 inches in height, and 3.4 inches in diameter. We plan to fabricate the next version in ceramics to allow users to drink from

Figure 4: *MugShots* hardware

¹ Arduino, <http://www.arduino.cc/>

² Rhino 3D modeling, <http://www.rhino3d.com/>

³ MakerBot, <http://www.makerbot.com/>

the mug. The backend server consists of a web interface (Fig. 5) for users to select images to transfer onto the mug.

Pilot User Study

To access the potential of *MugShots* as a social catalyst, we conducted a user study with 10 users. Half were female, with the age ranging between 21 and 37 (average 29). User would select an image to display on *MugShots* from their offices, then carry the mug to a few public spaces (i.e., coffee machines, lounge) and also walk around with the mug. We encouraged the users to think of additional functionalities they would like to see in the system. After the study, we conducted a 20-minute semi-structured interview with each participant. Some insights:

- Social Catalyst: *MugShots* attracted a lot of interest and conversation when brought to public spaces. After the initial excitement of seeing a "display mug", most conversations gravitated towards the image on the display. One participant put up an image of his dog. This raised rapport about the age of the dog, how cute it was, etc. Another user put up an emoticon sticker of an angry cactus. People asked if she was having a bad day or feeling stressed. We found these to be encouraging examples of the potential of *MugShots* to stimulate social interaction.
- Selection of images: We found it interesting how people from different cultures and demographic had different image preferences. Our Asian female participants selected emoticon stickers. Others, who were active photo sharers on social media, selected images from Instagram or Facebook. Still others preferred logos of brands and organizations they

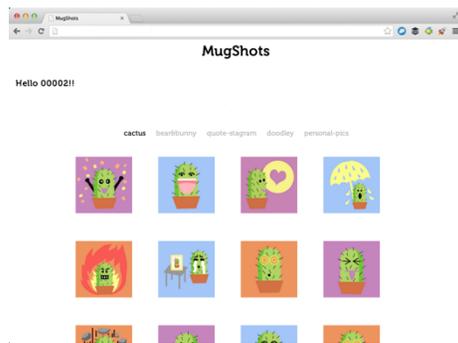


Figure 5: Web Interface

identified with. We are intrigued by the how people express self-identity though different types of images.

- **Frequency of image change:** Interestingly, we observed that people have different preferences towards image change frequency. Two of our participants wanted the image to change continuously, running though all of their online photos every few seconds. Others expressed they only change the image every few days.
- **Display size:** We are encouraged that our interviewees were not put off by the small display size. Several participants even preferred the current OLED, expressing it was visible yet discreet.
- **Display placement:** Currently, the OLED display is designed to be facing the user when they hold the mug. We have prototyped left and right-handed versions. Participants had mixed comments, some preferring the inward facing design since it felt more personal, while others wanted an outward facing display so it would be apparent to others.

From this pilot study, we were able to gauge initial user reactions towards MugShots, and also collect feedback for future iterations.

Related Work - Smart Mugs & Cups

The Mediocup [8] records data about the mug user and surrounding environment, converting the data into ambient sounds in a remote office. Mr.Java [9] is a coffee machine that recognizes user coffee preferences through RFID tags on mugs. Mug-Tree [10] and Playful Bottle [11] are pervasive technologies to encourage water drinking. Lover' Cup connects remote lovers through LED lights that light up when drinking. The BuddyCup connects people on Facebook when they toast their cups.

MugShots explores how a mug with a display can stimulate social interaction in the workplace. It differs from Lover's Cups, which creates co-experience for remote couples, and BuddyCup, which connects co-located people into the digital world. MugShots connects co-located people by triggering conversations which otherwise would not have taken place, with the aim of strengthening social ties and awareness of others in a workplace.

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