MugShots: Everyday Objects as Social Catalysts

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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.

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Social Catalyst, Computer Mediated Communication

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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].
We explore leveraging existing objects in the workplace to enhance social interactions. Instead of siting 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 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 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 evolvement 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 though 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 would love to have a small dog to keep them company.
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) Arduino\(^1\) 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 Rhino\(^2\) and fabricated in
the MakerBot 3D printer\(^3\). 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
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

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identified with. We are intrigued by the way people express self-identity through 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 through 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 Mediacup [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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