

Touch To Talk: A Wearable Representing Social Media Metaphors

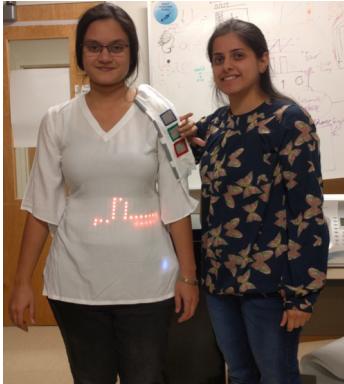


Figure 1: An image of the *Touch to Talk* wearable along with a close-up of the touch patches

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Abstract

With the growing popularity of social media, many person-to-person interactions happen in the virtual space using various metaphors like emojis, tweets, and likes. In this late breaking work, we aim to map such metaphors from the virtual world into the physical world and understand the interactions that follow. We have proposed and prototyped a wearable that is a tangible representation of two social media metaphors: *poke* and categorizing people as *friends*, *acquaintances*, and *strangers*. These categories have been represented using touch patches and the interactions are visualized on the wearable.

Author Keywords

Social media metaphors; Physical and digital world; Tangible social interactions; Wearables

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

We introduce a wearable prototype called *Touch to Talk* that highlights the wearer's interactions with their friends, acquaintances, and strangers in a social gathering through a playful and exploratory manner. This work aims to bring social media metaphors of '*poke*' and '*categorizing*' the people one knows from the

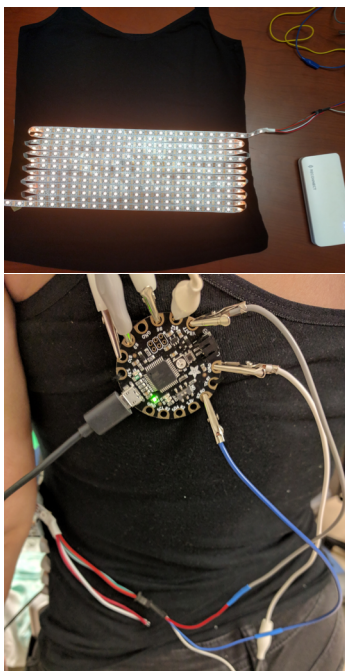


Figure 2: The top and bottom images show the front and back of the vest respectively

virtual world into the physical world through a tangible interface.

Social media has opened different forms of interactions such as likes, emoticons, tweets, etc. We explore Facebook's feature of labelling someone as one's friend, acquaintance, or stranger. Facebook allows unique features based on the level of intimacy one shares with the people on one's list of friends. For example, Facebook prioritizes news feeds of people that one marks as friends over those marked as acquaintances. Moreover, it does not allow one to view certain elements of information shared by people not on one's friend's list. Similarly, we investigate how Facebook's interaction pattern of categorizing the relationship between two people as friends, acquaintances and strangers can be represented in the physical world through elements that are playful in nature. We also include the 'poke' metaphor of Facebook in the design. The design is shown in Figure 1. We hope to provide a platform that encourages people to understand and interact with social media metaphors in the physical world, rather than completely relying on the virtual world. We also hope that the wearable encourages people to interact with a wider audience.

Through our work we aim to answer the following research questions: How do people interact socially while wearing *Touch to Talk*? Does the design encourage social interactions? Do people feel that their interaction level and pattern has changed with the wearable? What is the reaction of passerby's? How do people interact with their own wearable and others' wearables? Do people perceive the wearer differently by making sense of what the wearable represents?

Background

A few recent works have introduced the concept of mapping social media metaphors onto wearables. Najahfizadeh et al. have created a t-shirt that introduces the lightweight Facebook 'like' metaphor as

the number of people interacting with the t-shirt's like patch is displayed in the design [1]. They concluded that their design helped to increase social interactions. Kan et al. propose a t-shirt that reveals common interests of people, based on their social media profiles [2]. This scenario can encourage interactions between unacquainted people in a social gathering. iBand is a bracelet that represents information about one's relationships and is triggered through handshakes [3]. Patches aims to bring the 'poke' metaphor into the physical world as people get haptic feedback through their t-shirts on being poked virtually [4]. Kao et al. explore how technology can be used to facilitate social interactions in public and private work spaces through everyday objects such as mugs [8].

Devendorf et al. suggest two principles that should be used while designing e-clothes for everyday life [6]. The ambiguity of what the clothes represent is important to people as they do not wish to display the information portrayed by the wearable to everyone. The canvas metaphor says that people do not wish to wear screens and prefer slow and texture rich changes on their clothes. They also conclude that people wish to wear designs that encourage reflection and contemplation rather than efficiency and awareness. Ishii and Ulmer's work on Tangibles highlights the importance of bridging the gap between the physical and digital world [5]. Social media encourages people to interact completely through the virtual world.

The current literature does not explore the social media metaphor of different interactive possibilities based on the level of personal intimacy between people – friends, acquaintances, and strangers. Najahfizadeh et al. pointed out that people wanted a more personalized t-shirt and some people were uncomfortable being touched [1]. These are problems that we aim to overcome through our design by making the wearable's circuitry flexible enough to be maneuvered over different parts of the body or away from the body completely. We have designed the wearable such that



Figure 3: The top image shows the back of the vest along with the detachable cloth with patches. The bottom image shows the inside of the cloth with the patches connected with alligator clips

people can wear their own clothes over the circuit, thus allowing personalization.

System Design

Our design consists of a vest with 3 patches and LEDs arranged in a grid-like manner. The vest is worn under a t-shirt. Each patch represents a level of social relationship - friends, acquaintances, and strangers. As the person wearing the t-shirt interacts with different people, the person approaching the wearer presses the patch corresponding to the category that best represents their relationship with the wearer. This results in some of the LEDs being lit up and as more people press the patches, more LEDs light up with a dynamic brightness and color which are based upon the number of different types of interaction that the wearer has had. The LEDs light up to work their way towards forming a pattern. This design is intended to be used in casual social settings such as graduate mixer parties.

Our current design consists of a vest which has 300 individually addressable RGB LEDs that are connected to an Arduino-compatible microcontroller called Flora. The LED strip is stuck on to the vest in a grid-like manner. The three conductive fabric squares that comprise of the patches have been stuck on to a long rectangular cloth. The Flora, stitched to the vest, senses a touch on the conductive cloth through capacitive touch sensing. The cloth containing the patches is attached to the Flora through alligator clips that are tucked inside the cloth. The alligator clips make the cloth and the patches adjustable in length and flexible in positioning. The Flora and LEDs are powered through a portable battery pack that is kept in the pocket of the wearer. People can wear their own t-shirts/tops over this vest and position the patches on

their upper body (arms, back, hands). During an interaction, they can also stretch the cloth away from their body, thus avoiding physical contact if required. Figure 2 and 3 show the vest.

Each patch is mapped to the number of LEDs that light up, the brightness of the LEDs, and the color added to the existing color palette of the LEDs. The LED settings were selected to model interactions on Facebook. We feel that generally people on Facebook, would interact more with their friends than with someone who is not on their friends list. We made the interaction such that a person would need to put in more effort to complete the pattern if they interacted dominantly with friends. A person interacting more with strangers would complete the pattern faster as we feel that interacting with unknown people is relatively tougher and rarer and hence the wearer is compensated for the same. Hence, we light only 1 LED for an interaction with a friend, 2 for an acquaintance and 3 for a stranger. Also, a person's feed on Facebook is usually dominated with updates from their friends and less so from people that they do not know. We model this using the brightness of the LEDs where the brightness achieved when the friends patch is pressed is higher than the acquaintance and stranger patch, giving more *importance* to friends.

We set the color of the LED for a friend as blue, acquaintance as green, and stranger as red. The brightness of the LEDs is maximum for a friend's touch, intermediate for an acquaintance's touch, and low for a stranger's touch. The brightness and color of the LEDs at any given point of time is a fusion of all the interactions till that point. For instance, if the friend patch is pressed first, an LED brightly lights up in blue. Then, if the stranger patch is pressed, three more LEDs are lit up. The overall brightness and color of the four LEDs is now a mix of 50 % red and 50% blue due to the two interactions. Similarly, the brightness is a mix of 50% high intensity and 50% low intensity settings. After a certain number of interactions, when at least 49



Figure 4: LEDs light up in different colors based on the touches. The image below shows the pattern that is revealed when 49 LEDs light up

LEDs light up, a pattern is revealed, which is personalized based on the color and brightness of all the interactions. The other 251 LEDs light up in contrast to this color, hence making the pattern stand out. Figure 1 shows a close-up of the patches. Figure 4 shows different LEDs lighting up and the pattern that is revealed after 49 LEDs light up – the *poke* symbol. The pressing of the patches is inspired from Facebook’s ‘poke’ metaphor. When a friend touches the ‘friend’ patch, colored LEDs at the bottom of the T-shirt light up and reveal the exact number of interactions that have happened with friends, acquaintances, and strangers. These LEDs are lit only till the friend’s touch lasts. Through this interaction, we mimic how Facebook allows more access of a user’s information to their friends as compared to strangers.

We selected a vest for this interaction as we aim to bring social media based interactions into a more visible and approachable space through wearables, as opposed to the digital screen, which keeps the categorization of relationships and interactions that follow completely private. We aim to study the effect of this extended visibility on the way people interact. We also wish to make social media based metaphors more ubiquitous as they move beyond the screen and get integrated in everyday clothes that people wear.

Evaluation and Observations

We created one prototype of the t-shirt and conducted an informal study. One of the team members wore the t-shirt for a few hours and walked through campus outdoors. She met 15-20 people which included friends, acquaintances, and strangers. After that, another researcher interviewed the wearer based on their interactions and observations. Based on this informal deployment, we noted the following observations.

Interacting with *Touch to Talk*: Many people interacting with the wearer were excited to touch the patches. One person touched every patch to decipher

what was happening with the LEDs. Another person hit the stranger patch multiple times to reveal the pattern and see the color that it would reflect. People were intrigued by the novelty of the wearable and enjoyed interacting with the LED lights. They were especially engaged when the pattern would reveal itself. One of the interactors also took a video of the wearable.

Thoughts on wearing: People were asked if they would wear this system and many showed enthusiasm to wear *Touch to Talk*, but only if more people around them were wearing it as well, more so in places like parties and social gatherings. One person mentioned that if in the future wearing LEDs would become a fashion trend, they would like to wear this vest. Another person noted and liked the flexibility of wearing their own t-shirt on top of the vest. A few girls were hesitant of people touching them and they were keen on making the patches completely detachable. Currently, our design allows the wearer to place the patches on different areas of the back, arms, and hands, or stretch out the cloth away from the body. We will further explore how these patches can be made completely detachable. One person wanted the LEDs to be on an accessory such as a hat rather than a t-shirt.

Applications: People were asked on how they would use this system. One mentioned that the t-shirt could be used for encouraging middle school children to mingle as they felt children at that age have a hard time approaching others and interacting. They also mentioned that it could be used for freshmen and graduate mixers, similar to what we propose. People also gave other applications such as speed dating and concerts.

Deeper questions: A few questions that people asked the wearer were intriguing and worth mentioning. One person mentioned that she would be a stranger the first time she met the wearer, but after that she would be an acquaintance and hence forth maybe a friend. Hence, if she met the wearer multiple times on the first

day of their interaction, what patches would she press and what sense would that interaction make? Another person wondered how the interactions and perception of a person would change if he saw their vest lit up with only red LEDs (stranger LEDs) and if that would make the wearer more approachable. Another suggestion given was to make the patterns customizable so that people could feed their own patterns into the system.

The wearer's point of view: The researcher wearing the vest found it comfortable. She mentioned that she did not feel any electronic component on her body. She liked what she was wearing as the LEDs caught the attention of many people. She was open to people interacting with her and touching the patches. Some people who looked at the t-shirt were hesitant to approach her, and she approached them instead. A few people did come to interact with her themselves. People observing from a distance, also joined in while others were interacting and when she was explaining the system's working. She noticed that the t-shirt invited conversations and people were intrigued once she explained the working of the t-shirt.

Discussion

We observed that people were intrigued by the vest and were excited to wear it in casual social settings. We also concluded that further work needs to be done to make the patches detachable, so people feel more comfortable with the system. We also aim to study how people would perceive others with certain shades glowing on their vest and how their interaction would change.

While brainstorming, we wished to build a wearable that could be used in social gatherings and serve as a conduit to spark interesting conversations. We used LEDs so that the wearable would be attention grabbing and would encourage people to interact. We then decided how to represent the different levels of interactions using the LEDs. To bring ambiguity in the representations [6], we fused the brightness and colors

of the different interactions so that the exact proportion of each level of interaction would not be apparent. We also lit up the LEDs in an incremental manner such that the absolute number of interactions would be very hard to decipher. Furthermore, we felt that having the LEDs form a specific meaningful pattern would be an incentive for people to use the wearable to figure out the pattern. The pattern reveals incrementally, forming a 'poke' symbol, with the index finger pointing towards the patches. This entire interaction has been designed to be reflective rather than performance based, as the colors, brightness, and LEDs do not represent absolute information but rather give a playful and meaningful interface [7]. The colors and brightness also give the option of some personalization as the users can opt to interact in a manner that lights up the LEDs in the color that they want. With our current design, people can wear the system under their own T-shirts. Moreover, the length of the cloth with the patches can be adjusted over the upper body. We feel this can help people personalize the system by wearing their own t-shirts, and it can also help to overcome the uneasiness associated with being touched [1].

Bringing social media metaphors from the virtual into the physical world can allow more visibility of interactions and hence may change the way people interact. However, the interactions are not as private as those on personal digital screens. Hence, we speculate that people may feel pressured to light up more LEDs, so they are not perceived as asocial or isolated. The current design empowers the person approaching the wearer more as they dictate the category of their relationship with the wearer. These dynamics maybe more complicated in the physical space if people have different views on the intimacy of their relationship, as compared to the digital interface that affords privacy of this categorization. Furthermore, deploying this design at scale may be difficult due to the costs associated.

We hope that *touch-to-talk* can be used in casual gatherings to increase social interactions. Beyond that,

we also speculate long term uses of this wearable. Would the wearable increase interactions to such an extent that relationships categorized as strangers and acquaintances are later categorized as friends? Does the wearer's pattern exhibit more shades of blue (the friend color) after prolonged interaction in a particular space? What would be the impacts of day-to-day socialization? We also speculate whether the creative component of adding one's own pattern to the vest may motivate people to wear and interact with the vest in anticipation of revealing their pattern to others.

Conclusion and Future Work

We have attempted to map social media metaphors from the virtual world into the physical world through a playful, wearable interface. In our design, we have included elements of ambiguity, personalization, and flexibility in placing the touchable patches. We aim to make 8-10 of these prototypes and deploy them in a party or large social gathering event. We will then investigate our initial research questions on how people interact with each other when they wear the system, how they perceive and interact with people based on the LEDs lighting up, and how people feel about the social media metaphor being mapped into the physical world. We also aim to make the vest more robust by using multiple strands of conductive thread rather than alligator clips, using light lithium batteries as opposed to battery packs, and making the patches completely detachable from the vest. We will also investigate on extending this design for day-to-day use beyond social gatherings and to study the long-term effects of using the wearable.

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