eMoodies : Interactive Cushions With Personalities

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Abstract

This project investigates how to embed IT into everyday environment, making ordinary cushions interactive and anthropomorphized with distinct personalities. Three *emoodies* were created; mary — the social one, cory — the sad one and steve — the mean one. They react to human interaction such as touch and they can also interact among each other. The *emoodies* communicate wirelessly and display their emotional states through facial expressions.

Keywords

Ubiquitous computing, interaction design, embedded interaction, interactive personalities, aesthetics of interaction

Introduction

The technology has reached a level where computers are surrounding us everywhere. They are expected to handle more, be more ubiquitous, more intelligent and to think for themselves. This project combines computer technology, interior design and adds a touch of ubiquitous property with think-for-itself features. The result is *eMoodies*.

eMoodies are anthropomorphized interactive cushions with different personalities. Some are positive and happy, some are introverted and shy and others are aggressive and mean. The personalities are revealed through facial expressions and physical appearance. They respond and react to human interaction such as touch, shaking and noise. Not only can they interact with the user, but also with other *eMoodies* and affect their emotions.

The *eMoodies* can be used in public areas such as student common rooms, break rooms in offices, waiting rooms and such. They encourage social interaction and are a good conversation starter. They can spice up the everyday environment with their enjoyable features and playfulness.

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Figure 1: Mary's yellow color and the softness represent a warm and loving feeling

Figure 2: Cory's satin fabric and the blue color give a sensitive and depressed impression.

Figure 3: Steve's black hairy fabric and the rectangular shape give a feeling of dominance.

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Design

Personality

It is important for the first prototype of *eMoodies* to have different and distinct personalities so that it will be easy to simulate the influence and interaction between them. Three *eMoodies* were developed through the process.

Mary is a social, positive and kind *eMoody*, who likes company from other *eMoodies* and being cuddled. It is very easy to make Mary happy and her happiness can affect other *eMoodies*.

Cory has a depressed personality and a negative attitude. He is always sad but becomes gradually happy if another happy *eMoody*, for example Mary, is around. He also requires a lot of attention and caressing.

Steve is a bully with tough attitude. He likes to bully other *eMoodies* and make them sad. He is dominant and likes to feel superior. He does not like to be cuddled in front of other *eMoodies* as he is a tough guy. However, he likes to be cuddled when no other *eMoody* is around.

All *eMoodies* have some common characteristics, they do not like to be alone and they like to be cuddled.

Appearance

The interaction with the *eMoodies* is intended to create emotions that are closely related to interest and attraction. Due to the *eMoodies*' different personalities, each *eMoody* will be designed to evoke different emotions. Through interaction a personal bond between the user and the *eMoodies* will be established from the user's point. The intended use should engage the user's interest and feel that it is fun to interact with them. We have chosen four broader areas to focus on: color, fabric, shape and facial expression. These areas play an important role for the look and feel of the *eMoodies* and will affect how people will perceive them.

Mary's Design

Since Mary's personality is positive, happy and kind, it is important to make design choices that create a positive perception of the *eMoody*.

Mary's color is yellow based on literature review upon colors, which showed that yellow evokes cheerfulness, extroverted, happy and positive perceptions [14].

A stretchy material which is soft and cozy was chosen to represent a warm and loving feeling, which

can encourage a user to pet it. Mary's shape was decided to be a quadratic shape with soft edges to balance the kindness feeling without the submissive hints. [12]

Cory's Design

The most important factor when choosing the color for Cory was the perception he is to give, which would be a caring, sympathetic feeling. A brighter hue of blue was chosen for Cory's color based on Kaya and Epps color study [2]. To further represent his withdrawn and vulnerable personality, a delicate satin fabric seemed to be optimal.

Cory's shape was decided to be of a lying rectangle; due to submissive and inferior status it represents [1].

Steve's Design

Literature states that black stands for anger, power and dominance which is what Steve needs to represent. [1][2][5] Steve's color was decided upon black, to give him a fearful image. As off material; Steve's material was chosen to be thought with a black ragged, almost hairy fabric.

Steve needs to be dominant of the other *eMoodies*. The dominance is easily shown with the shape of the cushion since his cushion needs to be taller than the others. This shows superiority, which reflects his personality [4]. To emphasize his edginess, he is literally given hard edges on the rectangular shape.

Facial Expression

There are four basic facial expressions: extremely happy, happy, neutral and sad. Other additional expressions will be described in chapter 4. The same expression may differ a little bit depending on the *eMoody*, but generally they look the same.

Figure 4 : Four basic facial expressions (from left): extremely happy, happy, neutral and sad.

Interaction

User Interaction

The *eMoodies* are social entities and like to be around users and other *eMoodies*. All *eMoodies* like to be caressed by the user and show this through their facial expressions which gradually become happier. This is true at all times except for Steve, who does not want to be caressed around the other *eMoodies*. Steve shows his dislike through vibration and annoyed facial expression.

Social Interaction

When putting an *eMoody* in the company of another, their mood gradually changes to happy state. This is true for the *eMoodies* that are friendly and have a positive personality.

Bullying

The *eMoodies* are of a friendly nature, but like human beings there can be negative personalities involved at times. Steve is an *eMoody* which likes to show off his dominance by bullying and make the other *eMoodies* sad. By putting him around other *eMoodies* he becomes happier as the other become sadder.

Dizziness

The *eMoodies* can become dizzy if the user shakes it too hard or throws it around. This is visualized through animated eyes (Figure 5).

Implementation

The central component in each *eMoody* is an Arduino microcontroller [6]. The Arduino language is based on C/C++ and supports all standard C constructs and some C++ features. For wireless communication and distance measuring the *eMoodies* use an XBee RF module for the Arduino [7].

To sense touch the *eMoodies* are embedded with piezo speakers. A microphone is used for the detection of sudden noise such as a door slamming. There is an accelerometer to sense if the *eMoody* is being moved around in different ways [8]. Actuator-wise, rumbling is created by a using a vibrating motor and the facial expressions consist of multiple segments of LEDs combining in different patterns to form faces.

The system works on a continual degradation of

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wants and needs. The more the social need is sated, the faster it degrades. The company of a single *eMoody* will not satisfy the social need at the highest level, but might keep it steady at a medium level. Adding another *eMoody* might keep the social need at its highest level. Sating the social need is also dependent on how happy the *eMoodies* are keeping each other company. The happier they are the faster other *eMoodies'* social need is sated.

Discussion

The *eMoodies* were designed with the intention to improve social relationships. During testing, we found that users tend to choose a favorite among the *eMoodies*, which we believe can initiate and generate conversation-starters among people. The *eMoodies* accept interaction from any source which can encourage interaction from more than one user.

Futile areas can be cheered up with an *eMoody* in it. Waiting-, coffee- and common rooms can be new places for social interaction. We can see multiple areas of use for this product as well. During the testing, a company representant could see usage of the *eMoodies* in a relaxation area. Through the testing we also noticed that children responded well to the *eMoodies*. They thought it was fun and eagerly tried to interact with them. Thus we can see a usage of *eMoodies* in waiting rooms in children hospitals.

Through our first low fidelity prototype testing, it showed that there is a cultural difference in interpretation of facial expressions. Our basic facial expressions were designed based on the result we got. However, this leads to another problem, as the more complex expressions; the more difficult it is to design something that would be correctly understood with any cultural background. More research on this area is needed.

The area for petting *eMoodies* wasn't very clear; a majority of the participants chose to pet the *eMoody* in the area around the face, rather than on its "head". It also revealed that participants seem to only interact with the frontal side of the *eMoody*. Only a few participants flipped the *eMoody* around to investigate what it looked like, but quickly flipped it back.
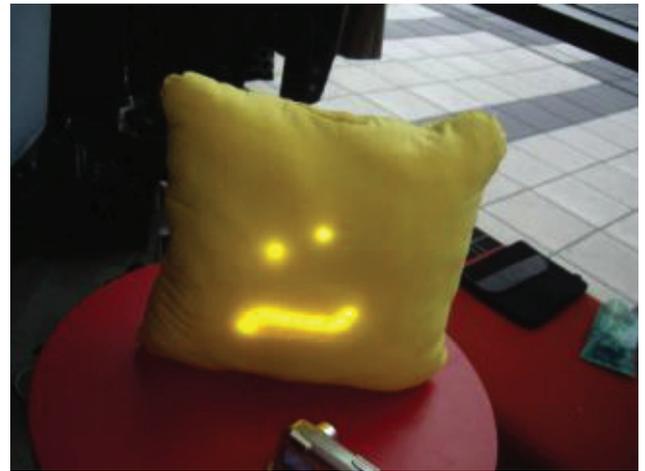

Figure 5 : The dizzy state of Mary.

Conclusion and Future Works

The project researched the possibility for computers to, not only be ubiquitous, but also have a life of its own while interacting with humans. The result was *eMoodies* — interactive cushions with embedded computer technology.

The *eMoodies* were designed to be seen for their distinct personalities and not for their embedded technology. Testing sessions showed that users appreciated the *eMoodies*, and created bonds to their favorite based upon personal relating and preferences.

For the future, more expressions should be developed to give the interaction more depth and complexity. By adding some artificial intelligence for more complex emotions, it could expand *eMoodies'* area of context and the life span of the user's relationship with them as they become more unpredictable and living.

In addition to developing the existing personalities, there are opportunities in developing more personalities in addition to the core three. An example could be a sporty *eMoody* that likes being thrown around or a rocker *eMoody* that enjoys having music around it.

New ways of interaction should be investigated, such as the original idea of putting a microphone so that it will react to noise. Adding some small but animal-like sounds to give as a feedback, or reaction to lights to give other personality trails.

Acknowledgment

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