

Emotional Contagion



*A collaborative work of art by Tina Gonsalves and Evan Raskob
User Experience Design by Evan Raskob*

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Overview and Concept:

I worked with Wellcome Trust-funded artist Tina Gonsalves in the roles of Interactive Designer and Software Developer to create a public art work titled Emotional Contagion, shown at various locations including the ICA London and the Wellcome Trust Collection in London.

Emotional Contagion was a public art work exploring how emotions spread through crowds of people as they react to one another in subconscious ways. This projection-based art installation had groups of people in a public space sending text messages to any virtual person in a projected crowd of virtual people, changing the person's emotional state and indirectly affecting the surrounding virtual people as they responded to this change in emotion.

The goal of the art installation was to engage with members of the public and help them begin to understand the complex process of how emotions spread through crowds in an interactive, visual way.

Background:

There are an unknown amount of distinct emotional states that we cycle through every day, as thinking and feeling human beings. Research has shown that emotions are tightly coupled with facial expressions, both in terms of those experiencing them and those perceiving them in others. For our purposes, we concentrated on 6 of the more primal emotional states, so as to get the basic concept of emotion across in our project, but not to over-complicate it, as it was an experimental work of art and not a rigid scientific experiment.

A Subset of Emotional States



sad



angry



surprised



neutral



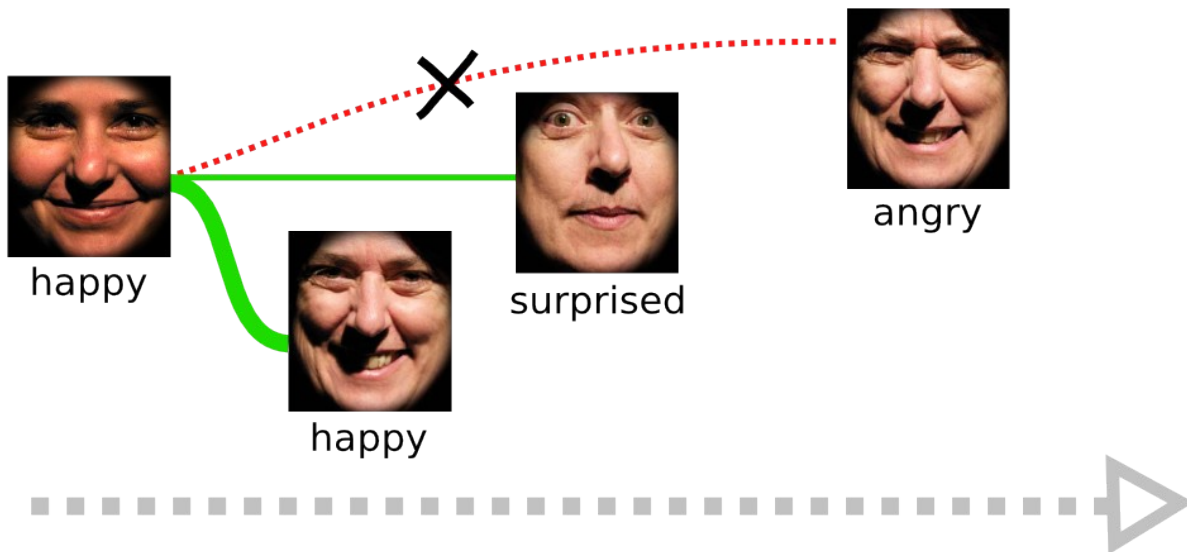
disgusted



happy

Emotions are unconsciously spread through anonymous groups of people according to certain observed rules. For example, after exposing a person to another with a “happy” emotional state we would expect them to react by taking on only a subset of all possible emotional states, such as “happy” or “surprised,” but not “sad” or “angry.”

Reacting to "Happiness"



In addition, left to themselves, without an external stimulus, a person can be modeled as changing emotional states in a similar fashion. For example, a happy state may morph into either a "neutral," "happy," "disgusted," or "surprised" state.

The project used algorithms modeling this transmission of emotions through crowds of real people based in part on scientific research, developed by myself in collaboration with neuroscientists Dr. Hugo Critchely and Dr. Chris Frith at the Wellcome Department of Neuroimaging at The Institute of Neurology (IoN) in London.

The following are selected portions of the logic controlling the change in states:

Broadcast Emotional State	Caused Emotional States	Ratio (probability)
Happy	Happy	20
	Surprised	1

Broadcast Emotional State	Caused Emotional States	Ratio (probability)
Surprised	Happy	16
	Neutral	1
	Disgusted	3
	Angry	4
	Sad	16

Assets:

Visual assets for the project consisted of hours of high-definition video shot by the artist, Tina Gonsalves at the Banff Center in Canada.

Software assets consisted of previous experiments using MaxMSPJitter and Javascript, designed to automatically run without user input on a Mac computer.

Design:

The final outcome would be suited to multiple participants in a public area. It would combine participants' intentions (changing a virtual person's emotional state) with an automatic, software-based process that diffused the emotional state throughout all adjacent virtual people.

Goals:

- Show the spread of emotions through a group
- Maximize number of potential participants
- Multi-user, simultaneously
- Simple to use (few button pushes and minimal interaction time per participant)
- Clear relationship between user intent and result
- Visually compelling
- Engaging to watch for non-participants

Constraints:

- Participants would be in a public space and have limited time to interact with the work
- Participants could be passing by or occupied with something else
- Budget did not allow for purchasing or developing custom input devices or controllers

Target Participants:

The project would be shown at the ICA London and the Wellcome Institute, so we concentrated on specific subsets of possible participants:

- Members of the general public who use mobile phones (young adults and older)
- People interested in art (young adults and older)
- People interested in science (young adults and older)

Design Solutions:

We decided to focus on people's faces in order to increase the number of people possible on the screen, and concentrate more on facial expressions than often ambiguous body language. Putting them in a grid on the screen was a simple solution that maximized the number of people yet allowed them to be easily referenced by row and column numbers.

Images were taken from still-frames of the videos shot by Tina, where participants acted out emotional moments in front of the camera over long periods of time.

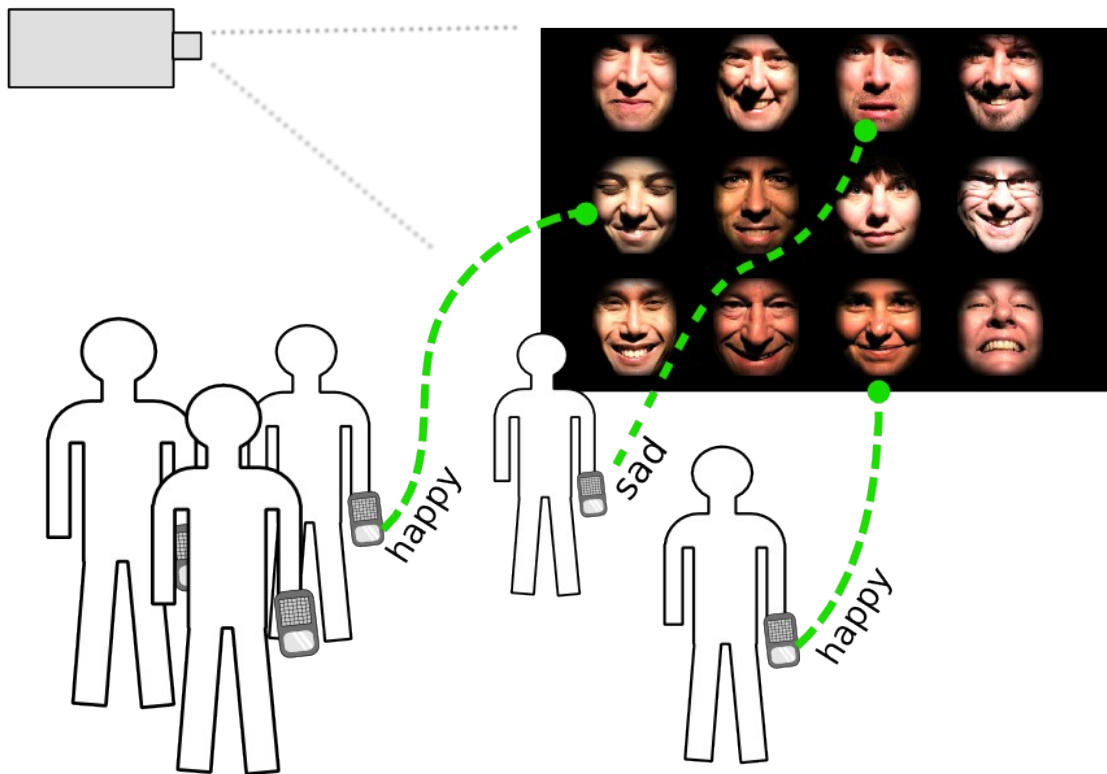
Mobile phones were chosen as the primary source of interaction because of their ubiquity and

familiarity as a device already used for communicating emotion to other people. Any member or the public could participate with their mobile phone by sending a text message to a specific number.

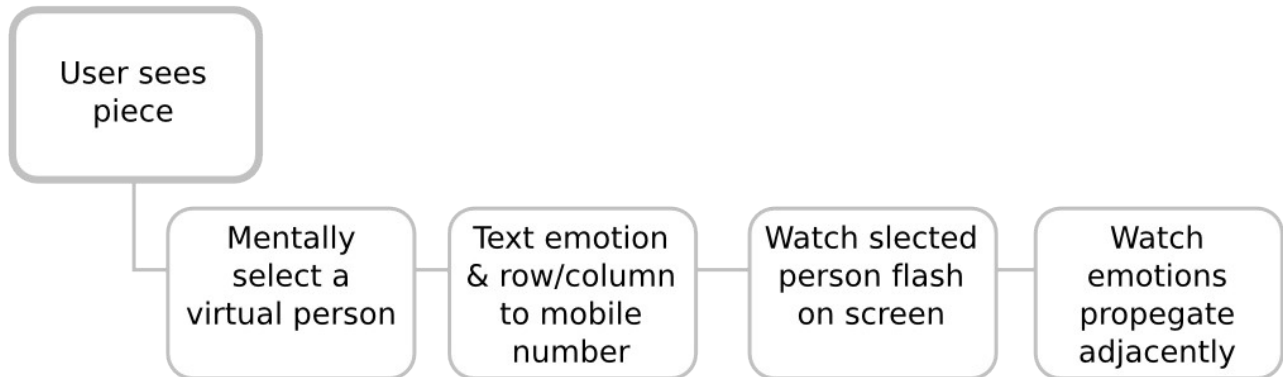
For simplicity of use on a mobile phone, the possible text messages consisted of names of emotional states (“happy,” “sad,” “angry,” “excited,” “disgusted”) and the row and column of the target virtual person.

In response to a text message, the person referred to would change emotional state by changing expression and flashing a few times, indicating the message received and acknowledged.

Emotional Contagion: User Interaction



User Interaction Map



Participant Scenarios:

I came up with three main scenarios for interacting with the work:

- Single or few participants exploring the work
- Groups of friends competitively or cooperatively – one-against-all, all-against-all
- Groups of strangers competitively or cooperatively – one-against-all, all-against-all

This being a multi-user work, interaction would be subtly competitive if many people used it at the same time because a participant's actions will affect the result of other participants' actions in direct ways, by changing or indirectly altering the emotional state of the same virtual person.

For a single person, the work would be an opportunity to explore how emotions spread.

Development:

The software driving the projected display of people was distributed as a single application and written in Java mainly using the Processing IDE. It pulled XML data about current text messages over the Internet from another computer attached to a mobile phone, running the open source SMS server called Kannel.

During development, decisions were made to slow the rate of diffusion of emotions over the crowd of virtual people so the process was more visible.

More Information:

Video at: <http://mlstudio.co.uk/emotional-contagion/>