A mobile platform for capturing emotion in the wild

Pete Denman & Erica Lewis

The team

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Human Emotion

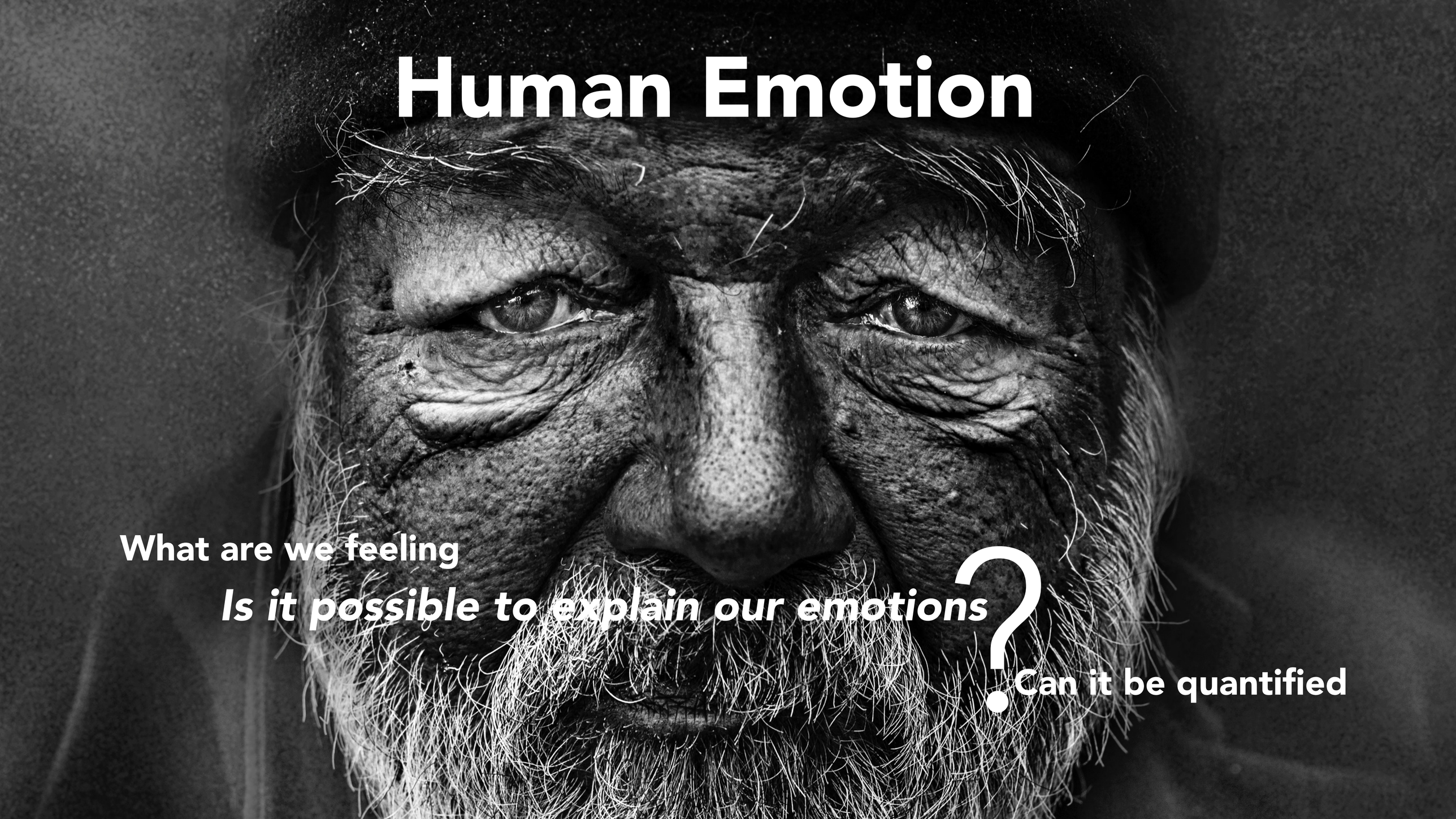
What are we feeling

Is it possible to explain our emotions

?

Can it be quantified

Human Emotion



What are we feeling

Is it possible to explain our emotions

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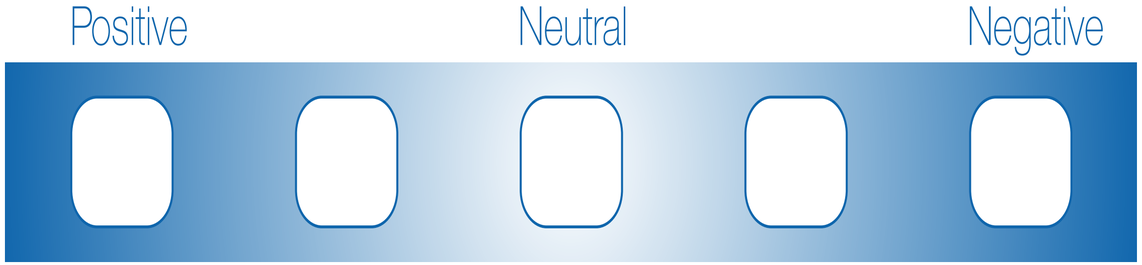
Can it be quantified

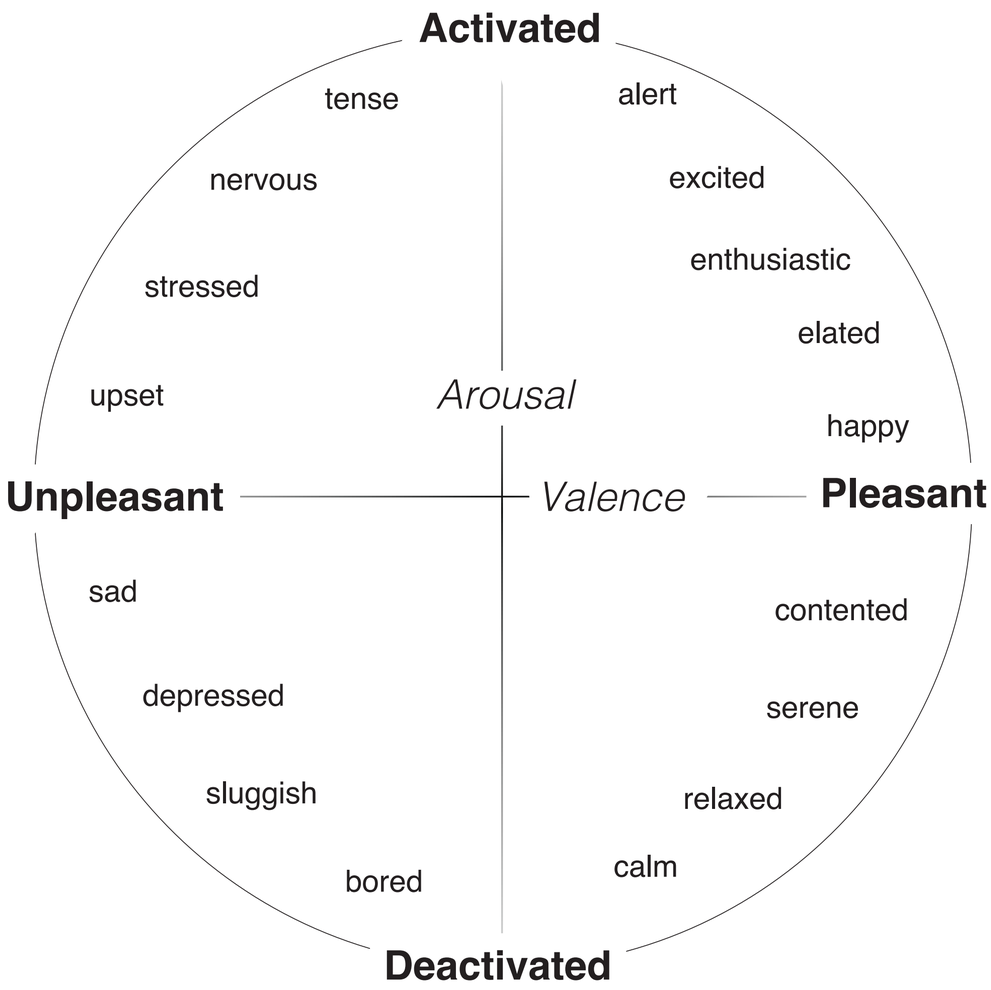
Design Intervention

Design Intervention

Understanding Emotion



Understanding Emotion



Understanding Emotion

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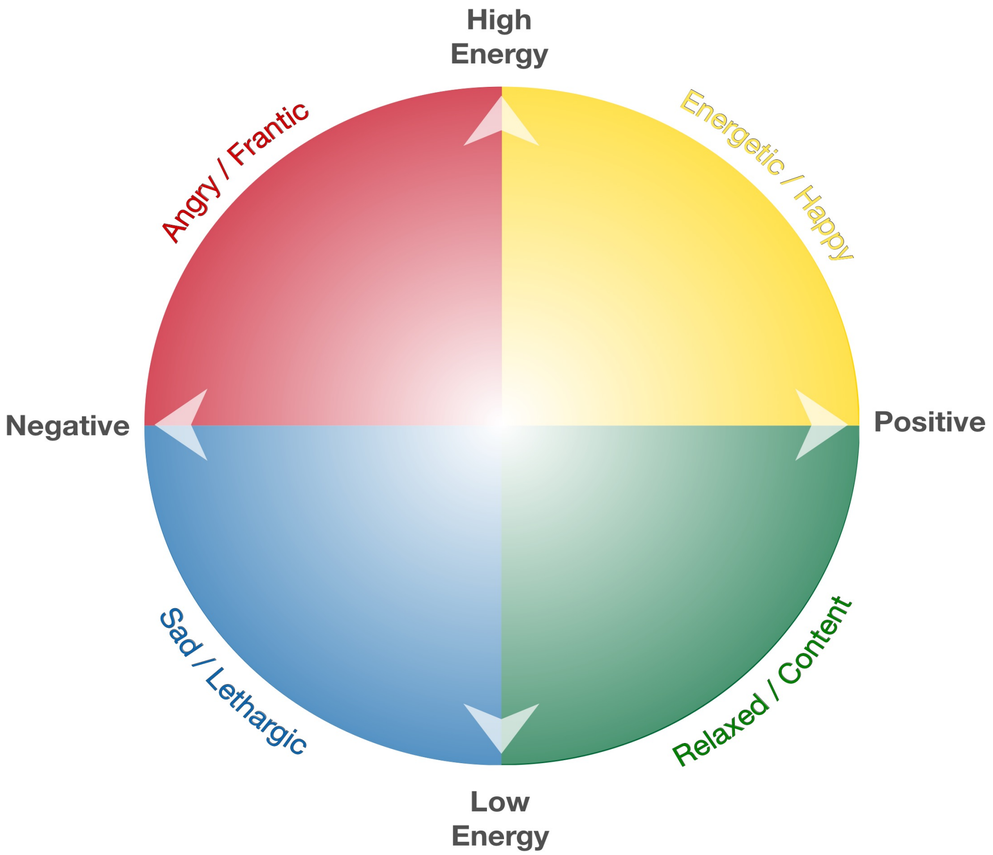


Angry

Afraid
Alarmed
Angry
Annoyed
Bitter
Defiant
Distressed
Distrustful
Enraged
Frustrated
Hateful
Indignant
Insulted
Impatient
Irritated
Jealous
Loathing
Startled
Suspicious
Tense

Happy

Aroused
Astonished
Confident
Courageous
Delighted
Elated
Enthusiastic
Excited
Expectant
Fantastic
Happy
Joyous
Light hearted
Lively
Lusting
Proud
Self-confident
Superior
Thrilled
Triumphant

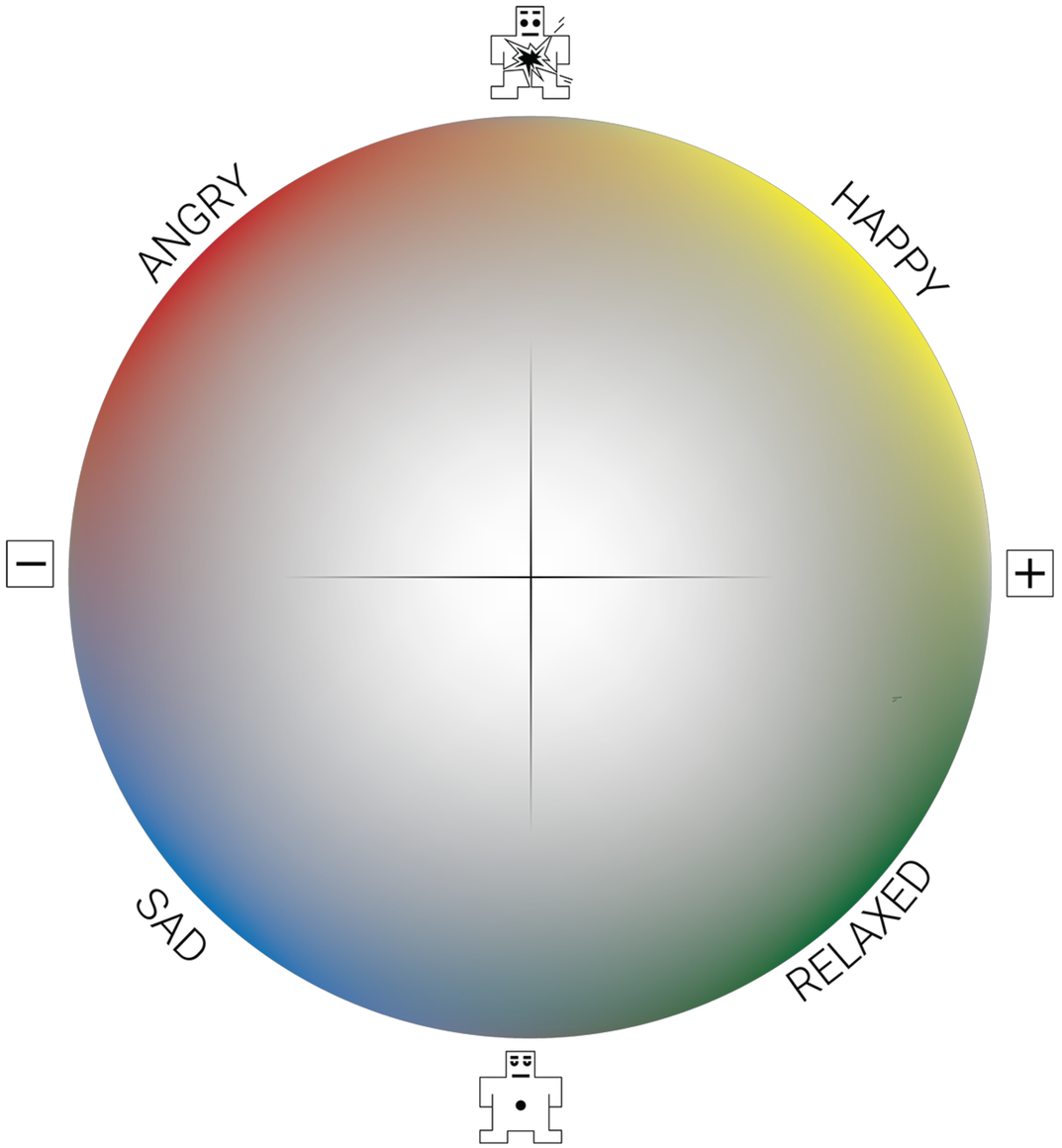
Sad

Anxious
Ashamed
Bored
Depressed
Disappointed
Dissatisfied
Distracted
Droopy
Embarrassed
Fatigued
Frustrated
Gloomy
Guilt
Miserable
Pessimistic
Sad
Tired
Uncomfortable
Vulnerable
Worried

Content

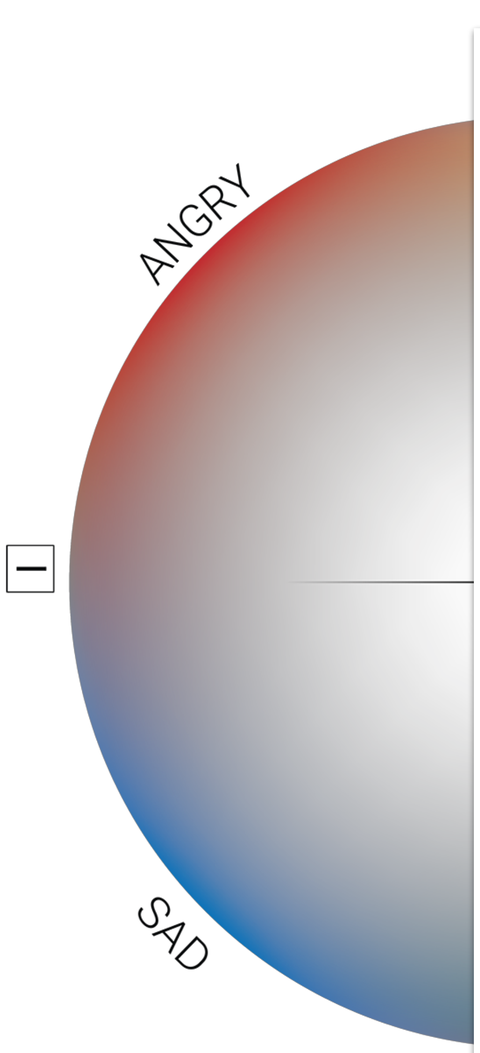
Affectionate
Amused
Attentive
Calm
Compassionate
Content
Convinced
Delighted
Determined
Expectant
Focused
Glad
Optimistic
Peaceful
Relaxed
Resolute
Restful
Satisfied
Serene
Sleepy

Understanding Emotion



Angry	Happy
Afraid	Confident
Annoyed	Delighted
Bitter	Enthusiastic
Distressed	Excited
Frustrated	Expectant
Insulted	Joyous
Irritated	Lively
Startled	Proud
Tense	Thankful
Sad	Relaxed
Anxious	Affectionate
Bored	Calm
Depressed	Content
Disappointed	Focused
Distracted	Glad
Embarrassed	Peaceful
Miserable	Restful
Tired	Relieved
Worried	Grateful

Understanding Emotion



Circles vs. Scales: An Empirical Evaluation of Emotional Assessment GUIs for Mobile Phones

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ABSTRACT
Natural emotional experiences happen "in the wild" as people are mobile, living their daily lives. To capture these experiences, emotion researchers often give participants smartphone applications with various graphical user interfaces (GUIs) to record how they are feeling, however, there exist few empirical tests that assess the comparative benefits and drawbacks of different GUI designs. This paper presents two empirical evaluations of three types of GUI designs for capturing emotion using both a 10 participant in-lab trial and a 100 participant AMT trial. We define GUI scoring metrics and report on participants' ability to rate real world scenarios and evocative images, respectively, in ways that are consistent with population norms and with respect their own emotion word choices. We additionally report on users' preferences for different designs, their perceived ease of use and the average time taken to complete an assessment for the different designs.

Author Keywords
Ecological Momentary Assessment (EMA); Emotion Models; Circumplex; Plutchik; Affective Computing

ACM Classification Keywords
H.5.2 User Interfaces; H.1.2 User/Machine Systems; I.3.6 Methodology and Techniques

INTRODUCTION
Emotional experience is an important aspect of everyday life, affecting our health, productivity, happiness and decision making [1]. As devices with artificial intelligences play an increasingly important roles in our lives, researchers have been striving for ways to augment these with affective awareness. A necessary step towards this goal is developing a quantitative model of people's emotions that can be interpreted by computational algorithms.

Emotion theory is a rich field that has developed many frameworks to understand and classify emotions. These models are based on well-founded psychological theory, however, they were not designed to be used by ordinary people or to provide quantifiable "ground truth" data for affective computing algorithms. In most affective studies, participants drawn from an ordinary population with a colloquial understanding of emotion words. They might describe how they are feeling as "fine" or "good" or "a little tired," but these types of feelings are not often studied as emotional states. Even words like "love" or "hate" that many people might consider as basic emotions categories are not considered as such by theorists who use very precise language to distinguish between emotion, emotional episodes, moods, states and disposition [3]. Other theorists use terms to describe the space of emotion that are not immediately familiar to participants. These include the terms "valence" to describe the positive and negative aspects of emotional affect, and "arousal" to describe its intensity [17].

To collect ground truth about emotional experience for machine learning algorithms, we need to collect and codify experiential data from ordinary people. Theorists have provided us with excellent frameworks through which to interpret emotion, but to use these for data collection we need to bridge the gap between the language of these frameworks and ordinary people's understanding of emotion. One approach is to train participants using tools such as Paul and Eve Ekman's Atlas of Emotion [4], but this approach can be time consuming and difficult to scale. We believe another approach is to use GUI design to help make emotional frameworks more intuitively accessible to people without special training. Ideally we want to design a GUI that people can quickly and easily understand, interpret, and use in a consistent way. Given that the GUI will be deployed in a mobile environment we also need the interactions with the GUI to be quick, simple and intuitive. To encourage both compliance and long term usage we also sought to find the characteristics of the UI that users liked the best. Therefore in addition to looking at objective metrics such as scoring time and consistency, we additionally asked the users to rate their subjective experience of the UI in terms of how well they felt they understood the UI, how easy it was to use, how much they liked it and how much they enjoyed using it.

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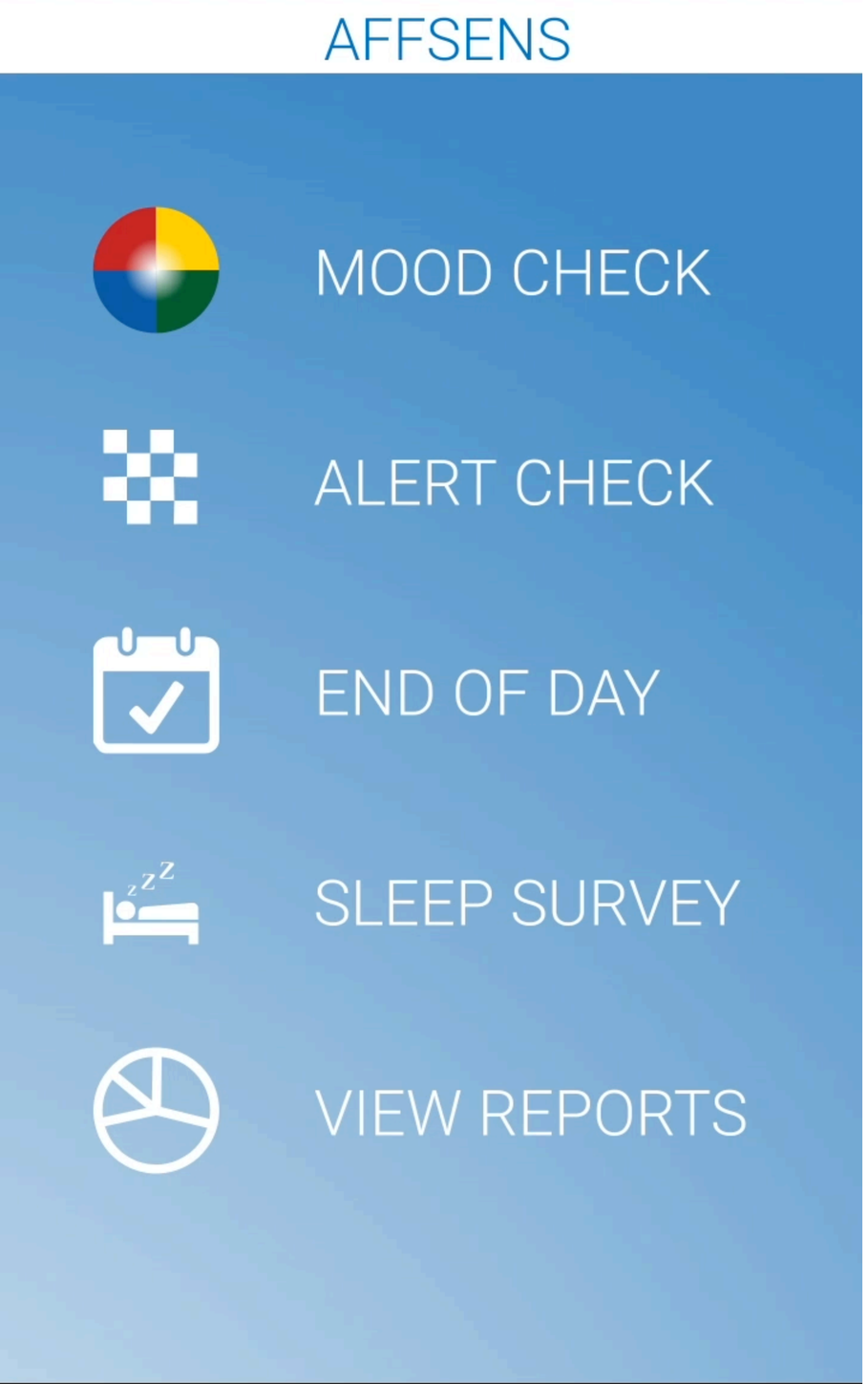
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Won Best Demo at Mobile HCI 2018

AffSens: A Mobile Platform for Capturing Affect in Context

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Abstract

Capturing natural emotions as they occur in the wild is a known challenge. Participant compliance is often low and often the most important events are not captured. We present a new application design for capturing emotional assessments in the wild, using phone based sensors to determine events of interest and to generate timely in situ prompts. We present a flexible design that allows both quick assessments (less than 30s) and in depth journaling. The application is designed to be beautiful, engaging and informative while capturing rich data to inform insights and algorithms.

Author Keywords

Mobile; affect; phone; assessment; GUI; sensor; smart watch; heart rate; audio; circumplex; emotion; design; survey; diary; application

ACM Classification Keywords

H.5.m. Information interfaces and presentation

Introduction

Natural emotions occur in the wild, while we are mobile: driving, walking, standing, talking to our friends, having lunch, caring for our children. To capture in situ emotion annotations, we designed a mobile phone platform that allows us to capture important moments in our day without slowing us down or interfering with our primary tasks. Our user experience allows for flexible engagement in three tiers: a quick ecological momentary assessment (EMA that combines aspects of both Russell's circumplex and categorical emotions; a free form long answer capability with both audio and text notes and longer surveys to get in depth information when the user has time.

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AFFSENS

SUBMIT

AFFSENS

Happy
Confident
Delighted
Enthusiastic
Excited
Expectant
Joyous
Lively
Proud
Thankful
Relaxed
Tired
Worried

Collection Multimodal Data

Speech & Text
Speech detection
Sentiment Analysis of Texts, Emails

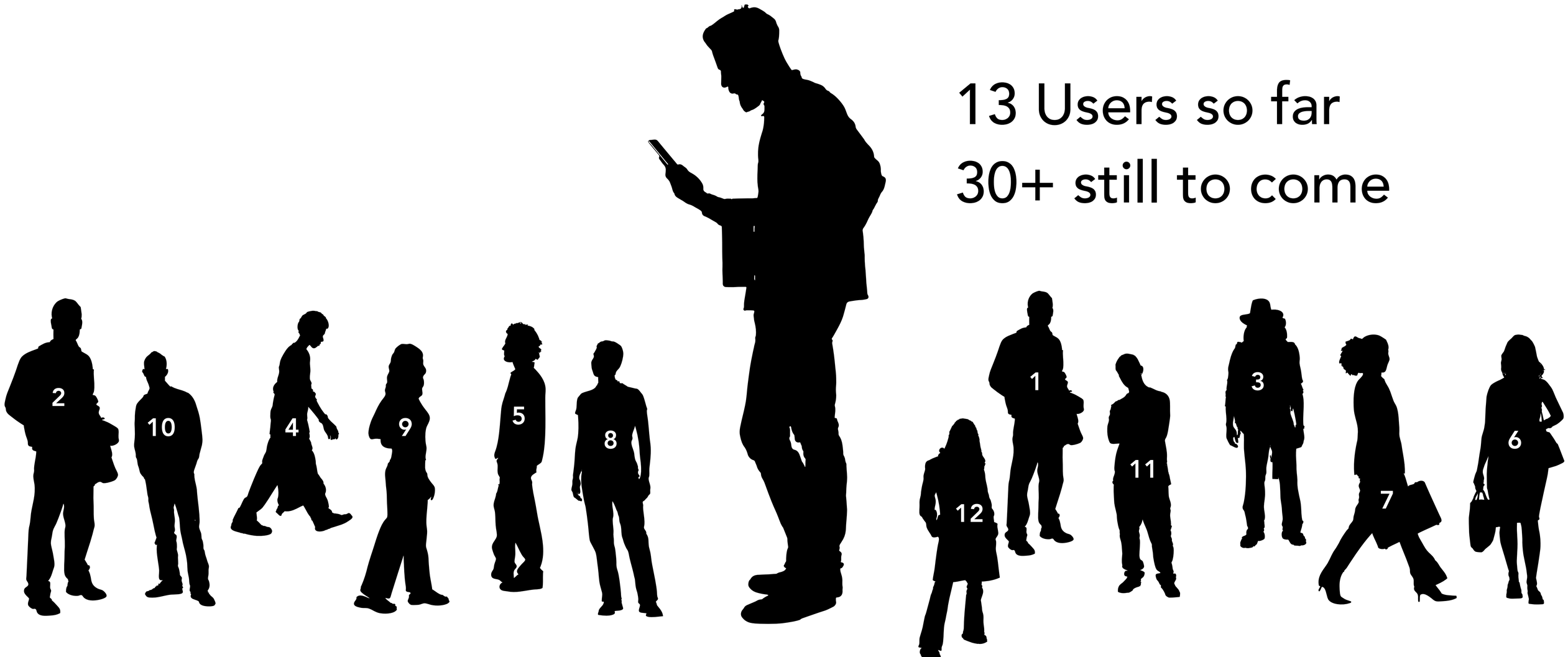
Bio-Signal: Heart-Rate
3 watches
Chest Strap

Drive detection
Video / audio analysis

Sleep
Noise detection
Heart-rate

Study

Study



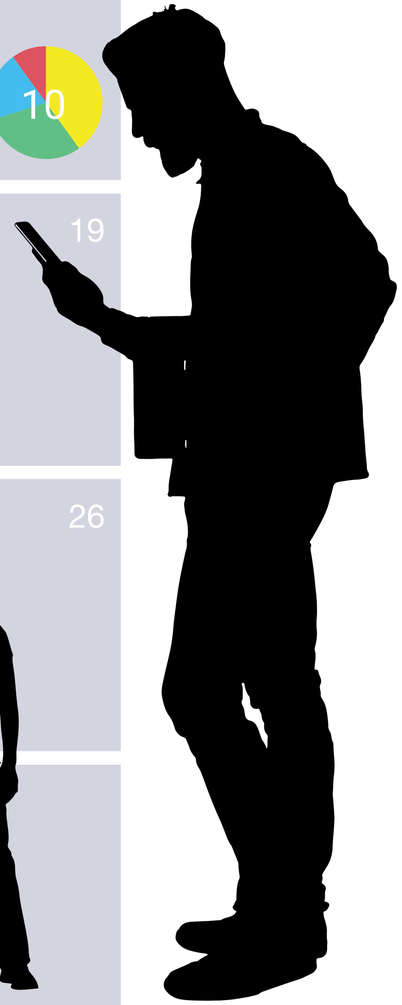
13 Users so far

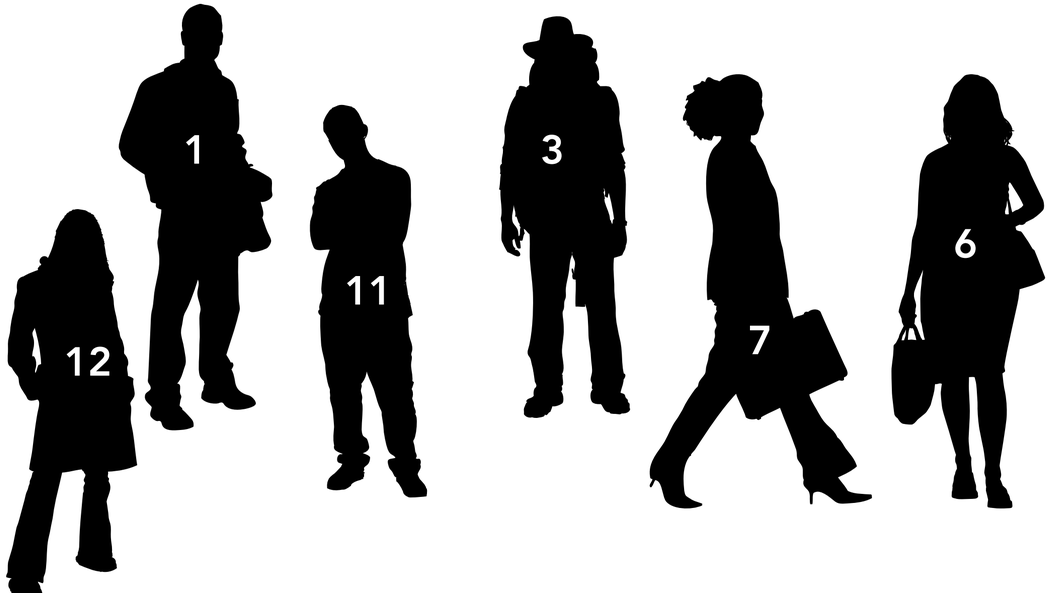
30+ still to come

Study

8 mood checks daily

2 surveys





Affective Computing

Is how systems and devices understand human emotion

Why?

To humanize interaction with computers

AI / deep learning needs more data to get started

Conclusion