Citation: Natalie Dixon, paper presented at the Creative Industries Research Centre Amsterdam seminar under the auspices of the University of Amsterdam on 1 March 2013.

HUNTING AFFECT

Emotions are some of our most deeply private and personal experiences. Cocooned in an intimate cluster of our personality, life stories and DNA, most times they are completely inscrutable, even to us. Yet, in the chartered tundra of emotion research, explorers hunt for affective charges. Running wild these charges are released into the atmosphere during our everyday tasks, interactions and encounters. Do you feel fascination or amusement right now? Did your feeling of content collapse into rage when your coffee machine demanded a filter clean this morning? Does your mobile phone intimidate you?

The first explorers turned to the expression of emotions in man and animals; later biometric measurements; a taxonomy of facial expressions and more recently chartering the Internet, navigating the woven web between people and their online social networks. What makes the hunt so addictive is the holy grail it offers: the revelation of emotional patterning and an understanding of people’s motivation and ultimately behaviour. In the context of design, capturing emotional charge offers the shining promise of understanding how specific design elements and emotion relate. It gives us access to a world where emotional responses shape the design agenda of everything we use and own.

In a research project lasting seven months, spanning Amsterdam and Munich, frog and I joined the hunt for affect1 facing some core assumptions about how emotion is made and measured. The result calls for a turn to playful user profiling drawn from diary-style content to aid the design process. A concept titled Emocamera was born: a playful, social and creative mobile-camera tool that gathers knowledge of people’s lived experiences, feelings and hopes in their own words and images.

FROGS

It is the pervading law of all things organic and inorganic, of all things physical and metaphysical, of all things human and all things superhuman, of all true manifestations of the head, of the heart, of the soul, that the life is recognizable in its expression, that form ever follows function. This is the law.

- Louis Sullivan

As the Americans withdrew from Vietnam in 1969 and The Beatles released Abbey Road, a trio of German industrial designers started a company in former West Germany. Hartmut Essllinger and partners Andreas Haug and Georg Spreng later called it frog (all lower case): a nod to Bauhaus philosophy and the (f)ederal (r)epublic (o)f (g)ermany. These were the early heady days of frog, now a global innovations firm with offices in thirteen countries. It was the year Apollo 11 landed on the moon, the first ATM was used in New York and the Boeing 747 jumbo jet made its maiden voyage – a watershed year for how people interacted and transacted in the world. Esslinger and his partners, believed in emotional design and their dewy-eyed vision was “to improve people’s lives.” In a time when technology was celebrated for its efficiency and mechanical prowess, frog joined the vanguard for humanizing it.2

frog designs and develops products that influence our everyday rituals – mobile applications for large supermarket chains, in-store touch screens, mobile phone handsets, patient-centred models for healthcare, amongst many others. Their work directly enables some of our most valuable communication and interaction channels, mediating our needs and

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1 Affect is defined here as: a familiar psychologised notion focused on the emotions (Wetherell, p.2)
2 Esslinger, H. a fine line, Jossey-Bass, San Francisco, 2009, ix
desires. frog research teams do truly, deeply immersive research in local areas with local guides, observing people in their environment, often staying in their homes. This work takes them across continents and subjects: from mobile money practices in Afghanistan to coffee making habits in Europe. Their research methods are expressly qualitative with a reputation for being a harbinger of tricky and nascent terrains. They are experts in ethnographic methods with design researchers based globally, contributing to a bank of insights. frog researchers have a complex role: not only do they have to make the link between motivations and emotions in users but also translate that into meaningful contributions to the design process.

frog Experience Design Director Laura Richardson³ emphasises this:

I think our deepest insights are ones that have an emotional underpinning.
...when we say something “speaks volumes” to us, we are really saying “conveys feelings. I don’t just love Slurpees....they remind me of a time my family was together, I got to anticipate getting it once a week after church, it was a ritual, I’m reminded of being a kid = new nostalgia.⁴

While unmistakably frog recognizes the value of research, their commercial goals move them to seek its tangible and material contribution to the design process. Ultimately the same view applied to the embedded research project. It had to manifest in a way that realized its value and relevance. The tacit frog directive was that the embedded research project should not be allowed to stray into the rarefied academic atmosphere but instead be wholly practical and generative.

Working in a frog office today is a bit like Alice in a technological looking glass. Glimpses of future technology and new experiences are all around. The heady and exuberant energy that characterised the early days still simmers. Walls are peppered with slogans like ‘Love What You Make’ that in any other office would be rendered glib, but in the frog context are perfectly natural. frog’s office in Amsterdam, where this research took place, is epitomised by a very nomadic, fluid feel. Characterised by their outwardly critical thinking frogs have an extreme work ethic. frog Amsterdam is a very playful and fun environment headed by creatives with a healthy curiosity about affect research. For frog to innovate and generate emotionally responsive design work it is critical they push the agenda in emotion research. As one of the unique affordances of embedded research it allowed a tandem-style for setting the research agenda – drawing questions both from frogs and myself. This condensed into a single mission:

**To develop a research method that gathers rich insights into the emotions of consumers globally and delivers a meaningful contribution to the design process.**

**MAKING AND MEASURING EMOTION**

In 1861 the French physiologist Guillaume Duchenne⁵ administered the final electrical probes to a man’s face. He signalled to the photographer to ready himself. The toothless subject (a patient of Duchenne with a type of facial anaesthesia) was unable to feel what happened next. His face contorted as the probes artificially (re)created expressions of terror, grief, and surprise amongst others. Like other physiognomists and phrenologists at the time, Duchenne was working towards a catalogue of the expression of emotion in the human face, something he saw as a god-given language, even a window into the soul.⁶ Seven years later, visitors gathered in front of Charles Darwin. He produced Duchenne’s images and asked everyone to

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³ Co-creator of the emotion engine concept
⁴ Email correspondence, 25 June 2012
⁵ Guillaume Benjamin Amand Duchenne
⁶ Duchenne, Mecanisme, part I, 31; Cuthbertson trans., p.19.
identify the emotion they saw. Did everyone recognise grief? What about surprise? The results were critical to his research for *The Expression of the Emotions in Man and Animals*, published in 1872.

Fig1: Photographs taken by Adrian Tournachon of Duchenne’s experiments to recreate expressions of emotion in the face, courtesy Cambridge University Library.

Duchenne and Darwin’s research offered the priceless building blocks of emotion research, especially in the psychobiology research field. But in the face of increasingly complex everyday technologies, contemporary discourse has emerged to challenge perceptions of how emotion is made and measured. In this spirit, emotion researchers working in the field of cultural theory and social sciences have broadened the terrain beyond physiological metrics like facial expression, heart rate and sweat levels to allow for the complexities of emotional experience. Measuring these experiences means exploring multi-layered, multi-modal and sometimes playful tools and methods to expand our knowledge of emotion. After all, a show of affect is never isolated to somatic changes in the body it also involves cognitive, motivational-behavioural and subjective-experiential components that are often difficult to capture conclusively.

A natural starting point for the embedded research project was to review the landscape of contemporary measurement tools and their applicability to frog research. The next section outlines a selection of these, cherry-picked to showcase different themes. It includes: a pioneering web-based data visualization positioned as a real-time barometer of human feelings; a character-based product measurement tool called PrEmo developed by researchers in the Netherlands; frog’s bespoke concept for an Emotion Engine and a playful consumer mobile application called Emotish that allows emotion its performative side.

But first, a note on cultural probes and valuable considerations with regards to emotion, measurement and design. Cultural probes are a relatively new set of tools for a design-led research approach to understanding users, stressing empathy and engagement spearheaded by

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7 Influenced by the fashionable beliefs of Physiognomy of the 19th century, Duchenne wanted to determine how the muscles in the human face produce facial expressions that he believed were directly linked to the soul of man. He is known, in particular, for the way he triggered muscular contractions with electrical probes, recording the resulting distorted and often grotesque expressions with the recently invented camera. He published his findings in 1862, together with extraordinary photographs of the induced expressions, in the book *The Mechanism of Human Physiognomy* (Mecanisme de la physionomie Humaine). - Wikipedia


a group of researchers in the late nineties at the Royal College of Art.11 Probes are collections of evocative tasks – like describing their favourite gadget on the back of a postcard, creating a photo album or keeping a dream diary – meant to elicit unconventional insights from people. The tasks are anything but defined, rather they are loose and open-ended ways for participants to respond. This is not comprehensive gathering of information, but rather fragmentary clues about people’s lives, thoughts, desires and beliefs.12 13 Acting more like provocateurs than researchers this vanguard’s final aim is to alter our perspectives on technology in a functional, aesthetic, cultural, and even political sense in the design phase. This model favours opportunity to discover “new pleasures, new forms of sociability, and new cultural forms.”14

Fig.2 Examples of items that make up a probe kit

Examining the concept of cultural probes it begs a significant question of researchers – how is emotion made and measured? The answer relies heavily on our approach, perspective or model of emotion. Recent lines of thinking contrast the idea that emotions can be simply categorized and neatly boxed. That we cannot seek a “ground truth picture of emotion involving summative and replicable assessments.” This discourse (in which cultural probes have their roots) favours richness of input, the construction of emotional meaning from a variety of sources, where room for interpretation is seen as an asset not a liability.15

Another key question is therefore: is emotion a discrete unit, an objective information bit that can be captured and contained then externally measured and categorized? Like Darwin and Duchenne’s work, this perspective sees emotion as information, in this case physiological. But, does emotion deserve a more complex model? One that recognizes it as a more dynamic, perhaps ambiguous, phenomenon that forms part of an experience?16 The emotion-as-experience perspective presents a compelling, albeit challenging perspective, but one that I argue is very relevant to the design process.17

Overall, as shown in the case studies outlined in this paper, to capture and unpack emotion is like pulling apart a symphony. As researchers we should learn to accept that although a score governs them, affects are “never wholly owned, they are always intersecting and interacting.”18 They are experienced as a complex whole and are deeply relational, composed of amongst other things, biology, culture, context and circumstance.19 To try isolate individual components will only yield a small inkling of the final complete sound. However, some researchers, like the first pioneers to charter the emotional web, are contributing to this

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11 A cultural probe was a method developed by Dunne, Gaver, Dunne and Pacenti in 1999.
12 Gaver, W., Boucher,A., Pennington,S., Walker, B. Cultural Probes and the Value of Uncertainty, Interactions, date
17 It also recognizes that cultural and social factors play a part in the construction and experience of emotion.
challenge.

We Feel Fine: An Almanac of Human Emotion

In 2006 the self-publishing revolution swept across the digital world. People turned to the Internet to share their most intimate and private thoughts with the blogosphere.\textsuperscript{20} For the first time the web became emotional. A vast kaleidoscope of emotional expression, it gathered in size every day with almost insurmountable amounts of data. It presented a fascinating social research terrain as people fed their need for connection without the constraints of commitment.\textsuperscript{21} So in this spirit, Jonathan Harris and Sep Kamvar, a computer science/art duo at Princeton University, created the emotional search engine and web-based artwork \textit{We Feel Fine} (\url{www.wefeelfine.org}). In the words of the creators:

\begin{quote}
The We Feel Fine search interface allows users to search or browse… asking questions such as “How did young people in Ohio feel when Obama was elected?” While most research in sentiment analysis focuses on algorithms for extraction and classification of sentiment about given topics, we focus instead on building an interface that provides an engaging means of qualitative exploration of emotional data.\textsuperscript{22}
\end{quote}

The site is a frenetic and mesmerizing data visualization representing a database of human feelings (collecting up to 20,000 a day). Each coloured ball (see Fig.5) represents a sentence extracted from blogs containing the words “I feel” or “I am feeling.” The system stores the sentence and records the emotion expressed (happy/ sad / amused) and clusters similar posts together.

Fig. 5 depicts The “Madness View” representing a collection of feelings – seen from a bird’s eye perspective – like bundles of energy, bustling around cities, buzzing with charge, scampering from one point to the other. From here, the individual is lost in the collective, until you zoom in, pick on a coloured ball and let it explode into a sentence.\textsuperscript{23}

\begin{footnotesize}
\textsuperscript{20} Harris, J., Kamvar, S. \textit{We Feel Fine}. Scribner, New York 2009, p15.
\textsuperscript{21} Harris, J., Kamvar, S. \textit{We Feel Fine}. Scribner, New York 2009, p17.
\textsuperscript{22} Harris, J., Kamvar, S. “We Feel Fine and Searching the Emotional Web.” \textit{WSDM’11}, February 9-12, 2011, Hong Kong, China.
\textsuperscript{23} Harris, J., Kamvar, S.’\textit{We Feel Fine and Searching the Emotional Web’}. \textit{WSDM’ 11}, February 9-12, 2011, Hong Kong, China.
\end{footnotesize}
Kamvar and Harris’s project is significant, least of all because of its timing: before the birth of data dandies, before data became sexy, before the phrase ‘Big Data’ was bandied around. *We Feel Fine* was one of the first projects to show data had personality *and* emotions. It also represented a new type of research method gathering momentum in the academic and commercial worlds – using digital methods to capture and understand expressions of emotion. Commercially this technique is used as part of sentiment analysis tools for companies wanting to measure how customers feel about them. For social scientists, new media practitioners, artists, city planners and others, it provided an agile way to understand patterns of emotions related to things like politics, food, cities, the human condition, commuter networks and much more.

Mostly though, *We Feel Fine* pays homage to the idea that the web is not just about access to information but that it represents a type of organism – one that breathes, lives and has emotions.24 It provides evidence of how blogs, or the “voices of people”25 and their every day stories can be one of the richest terrains for harvesting insights into emotion. It speaks directly to the idea that emotion can be processed, perhaps better understood upon reflection in a collective setting. As people participated in writing, or even dialogue with other users it created an opportunity for measuring emotion.

frog projects look for insights in very content and geographic-specific sites (sometimes in areas without much data coverage or access to the Internet). While frog has a definite interest in mining data, they have yet to pursue these types of digital research methods. This is due to the granularity of the data required for their research questions. As frog principal director of design research, Elizabeth Roche, says,

> Can frog use a method like this to design an eco-system around personalized entertainment services across devices? For any of these we need to capture people's emotions in specific contexts, where they are often on their own and are not necessarily tweeting or SNSing (I'm stunned at how many companies still block access to SNS at work) nor are they necessarily somewhere public enough for us to find pictures where we could access facial expression data.”26

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25 Lovink, G. Blogging. Lecture at University of Amsterdam, September 2010.
26 Email correspondence with Roche dated 26 October 2012.
Even though tools like *We Feel Fine* pose hamstrings to research in terms of language and data specificity, it provides clues of new ways of conducting emotion research – highlighting stories, collective presence and interaction as valuable cornerstones.

**Emotion in Twelve Parts**

In 2002 Pieter Desmet defended his PhD dissertation *Designing Emotions* at the Delft University of Technology in The Netherlands. An industrial designer-turned-emotion-researcher, Desmet developed a tool called PrEmo – a way to measure emotional responses to products. Godfather of emotional design, Donald Norman, called his work “a breakthrough.”

PrEmo over the years went through some tweaks and design iterations as it became a licenced tool under the consulting company that Desmet joined. From the onset PrEmo spoke directly to particular goals of clients – a way for companies to capitalize on people’s emotional reactions to “improve sales.”

PrEmo works by showing pictures of products to respondents online. They then have to rank each one with their emotional response in a 12-step process. Emotions are represented graphically by head-and-torso characters (Fig.6). The characters are augmented by subtle sounds – like a sigh or gasp – and body animations representing the emotional charge.

Viewed critically, PrEmo is nothing more than a selection of emoticons with sounds. To think that we can label our most personal and complex emotional states with these characters seems to lack scope. While lauded for its language-agnostic approach, PrEmo is restricted to its

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Fig.5: Some of the PrEmo characters - the emotions represented from centre top going clockwise are: Joy, Admiration, Satisfaction, Fascination, Boredom, Dissatisfaction, Contempt, Sadness, Shame, Fear, Disgust, Desire, Hope, Pride.

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28 Caicedo p.3
29 On a side note it is interesting to wonder what effect this character choice has on respondents – currently he is a Caucasian male. What if he was without race and gender? Currently, a female version is being validated by Delft University.
formalized emotion sets. In other words it recognises and operates in a defined scope. Despite being a tool positioned to inform the design process, when evaluating PrEmo for use at frog it became clear that many emotions represented in PrEmo were applicable to static products rather than experiences. It became difficult to label an experience, like checking in at the airport, with emotions like “fascination” or “satisfaction” or “joy”. More importantly PrEmo doesn’t allow for researchers to capture participants’ emotions at multiple stages of a process. Emotion runs on a dynamic continuum. For example, if I was first worried I wouldn’t make my flight, I became angry that the self check-in terminal loaded slowly and then relieved on receipt of my boarding pass. The design of PrEmo’s emotion set doesn’t contain some key inclusions for frog, that tend to be important for experience research, like whether the person feels ‘respected’ or ‘in control.’ The PrEmo team had independently recognized these points and spawned a diary-format mobile application concept called CapturEmo. The concept allows people to tag user-generated mobile video, audio recordings and pictures with characters more suited to experiences than products in a faster, more light-weight way than PrEmo. It has been tested in hotel service environments and proved to be successful in gathering experience samples of visitors.

Tasting Rainbows

Motivated by the possibility of expanding the frog research toolbox and inspired by the phenomenon of synesthesia, a team of designers at frog Austin developed the concept for an Emotion Engine in 2008. As a cluster of different tools they compiled a dashboard of five representations of emotional engagement – involving line, musical tones, facial expression, images and words (see Fig.7). The team sought to answer the questions long-since plaguing emotion researchers in the field: can the experience of emotion be self-reported without disrupting its flow? And, can emotion be measured on a continuum?

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30 www.capturemo.com
32 Synesthesia is a neurological condition in which two or more sensory experiences are inextricably linked in a person. The phenomenon manifests itself differently in various individuals. Some see letters in color – "A" might be green and "B" blue, while other people hear chords in a variety of colours.
Ultimately, the team recognised how ambitious it was to contain all five representations and so they reiterated the concept to focus on two dimensions only: visual and auditory. Sounds would be used to represent emotion states and they would be captured using an affect dial. As validated in previous research, major chords represent bright and happy emotions while minor chords represent dark and sad ones. If the user pushes the sound up this represents a higher intensity of the emotion felt and conversely the softer the sound, the less intensity felt. The major sounds are also supplemented with blue colouring and the minor with red as pictured in Fig.7. When the participant makes a comment, a snapshot is taken alongside it – so facial expression is captured in this process – represented at points in a timeline as pictured in Fig.9. Intrinsic to this process is that the participant is seated at a computer emotionally assessing something on screen and being video recorded during the process.

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Fig. 7 The emotion engine dial

Fig. 9 frog's emotion engine dashboard: The y-axis moves from a minor to major chord, in response to user feedback, while the x-axis represents time

By their own admission the frog team saw the engine fall short on information granularity, specifically with regards to the underlying motivations for an emotional response. Why did someone feel disappointed or frustrated by a design feature? It also left the context of the person using the emotion engine vague. Were they having a good day? Did they normally find computer interaction frustrating? Despite its mechanical approach, the Emotion Engine made a poetic attempt to create a musical score of people’s emotional landscape across time. It created a beautiful, if only conceptual, model for representing emotional ups and downs in
an organic way. The team intended an interesting addition that sees the user revisit the dashboard (see Fig.9) and the “experience song” to identify and discusses the findings with the researcher in an attempt to clarify meaning and interpret the results.

**You Mostly Feel Anxiety at the Office During the Day**

Amongst the thousands of mobile-based emotion applications available, most are about self-quantifying. Superficially, these applications quantify your emotional experiences and draw conclusions about your emotional state of being by user-inputted data. They couple your mood, location, social context and time of day to generate very basic readings. Something like: You mostly feel Anxiety at the Office during the Day.

The inclusion of Emotish – a U.S mobile emotion application – in this paper, is to give a nod to applications that help users process emotions in a social, playful and performative way. The application asks users to photograph their own expression of emotion, label it and submit it to a greater collection of user-generated images. The application performs as a giant catalogue of facial expressions and one-word descriptors of how people feel.

![Fig.8 (left) Screenshot of one someone using Emotish](image1)

![Fig. 9 (right) Screengrab of the mobile application Emotish](image2)

The application is weakened by the amount of cognitive effort and memory it requires. Users have to represent how they feel in an image – through facial expressions – which means they have to artificially re-create a normally natural expression. The application makes an organic process mechanical, but it also reveals a playful tool for having people participate and reflect on their emotional state in a collective context. In a sense the application becomes like a real-time personal emotion trainer. It connects people who label emotions in a similar way, thereby creating room for emotional processing.

One of the research tools in the frog portfolio is a lightweight crowd-sourcing programme called frogMob that gathers quick insights about all aspects of daily life (not just emotion). It’s a web-based thematic collection of user-generated images from frog employees and other interested people – not unlike Emotish in format. But what frogMob can glean from applications like Emotish is its ability to see emotion as performative. It tacitly acknowledges how users perform for others in the community and may ham up or tone down their emotional
expression depending on how they want to be portrayed. In this way the application plays an interesting role in how people express and process emotion. As Richardson says about frogMob,

As there is a process for the picture’s consideration (upload, describe, etc.) the implicit and explicit choice of photo tells a story, is from a person’s perspective and illuminates what, how, where, who a participant “sees” as meaningful to the mob.  

Perhaps the frogMob potential lies in its ability to become a lot more social thereby unlocking elements like commentary, dialogue and perhaps even crowd-sourced analysis. In this way the frogMob data has the potential to become more emotionally competent.  

Fig. 10 Screengrab of the frogMob section on the frog website

IDEATING

Armed with a sense of the challenges and possibilities in developing a tool to measure emotion, the next phase was to conceptualise a bespoke frog tool. One of frog’s keenest tools are ideation sessions, branded frogTHINK designed using the tenets of Edward de Bono’s theory on lateral thinking37 where teams of researchers, designers, strategists and (sometimes) clients use methods to generate “break out ideas.” These sessions are characterised by pacey, fun discussions and a lot of provocative “what if…” questions. It’s almost impossible to collapse into rut thinking using this format, so the results are not like conventional

35 Email correspondence with Richardson, 26 June, 2012.
36 Antonio Damasio originally used the term ‘emotionally competent’ to describe how a memory consists of two parts – “first the object itself and the construction the brain makes of it (auditory, visual, tactile)”. Van Dijck, J. Mediated Memories in the Digital Age. Stanford: Stanford University Press, 2007. p.34.
37 Lateral thinking, (literally, sideways thinking) uses various acts of provocation (such as escape, new stimuli, reversal) to incite ideas that are free from previously held perceptional assumptions. The method was designed to deliberately shift these assumptions for the purpose of generating observations and insights about a subject. (De Bono, E. The Use of Lateral Thinking, London, Jonathan Cape, 1967)
brainstorming but rather more explorative and inventive.

An ideation took place at frog’s Munich office (27 July 2012) to generate concepts for an emotional measurement tool. Thirteen frogs were divided into three groups for 90 minutes and each given a unique scenario: How to Capture an Emotional Charge while: 1. Making coffee at home 2. Using a software package. 3. Performing a mobile money transaction.

Running an ideation session is no small feat, Elizabeth flitted between groups guiding them in subtle ways to make sure ideas found form and everyone kept in time. It was obvious that the frog team bring a broad range of skills to bear: from very conceptual thinkers to client-focussed frogs to very practical designers. It was striking that no one in the session seemed to doubt or question the motivation for conducting research into emotion – there was an effortless acceptance of the viability of it. The frog team is massively multicultural, so their influences make up a kaleidoscope of different reference points that added positive diversity to the ideas. Amongst others, the group included Simone Rebaudengo, an Italian interaction designer whose masters dissertation in Holland centred on addictive behaviour and social toasters; Niels Clausen-Stuck, a Danish Associate Creative Director with a decade of experience in interaction design and Vivid Savitri an Australian who moved to Munich from Shanghai where she was based in the gaming industry for the last few years.

All the ideas were put to paper and roughly distilled and categorized into similar categories. While the ideation session is supposed to generate lightning-bolt ideas, the distilling process aims to separate out general approaches and beginnings of ideas versus very specific ones.

**Approaches:**
- Play and emotion are often associated. Play can generate emotion and/or emotions are part of gameplay. This was a valuable gem for embroidering further in the concept development.
- Emotion is almost like currency – it can be spent, shared and earned. Imagine emotion required some sort of guardianship from a bank? What if people were able to trade emotions or transfer them like with money? What if we could build up emotional credit or be in emotional deficit? What if people were able to trade emotions or transfer them like with money? While this theme is fascinating fodder for further research (and gives sober insight into how people evaluate emotion) we were not able to distil this into a workable concept for measuring emotion.
- Some unsurprising links were drawn between emotions and senses (smell especially) as well as emotion and colour.
**Fig 12. Approaches distilled from the ideation session**

**Idea Beginnings:**

- Emotion stamps are a valuable, overt and visual way for people to imprint their feelings on an object or experience. This yielded a great clue for the development of our final concept.
- It is important that emotions are connected to people not just places, experiences or things. In tune with the increasingly digital lives we live, it seems people want to share and validate their feelings with others.  
- Context is key to emotional experience and evaluation – similar to stamps, the idea surfaced for a “context button” that people could use to visually represent their context and help shed light on their emotional state.
- Using facial recognition software in an upgraded, mobile-friendly format.

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38 Turkle, S. Always On/ Always On You: The Tethered Self, MIT, p.128.
**Fig 13.** Idea Beginnings distilled from the ideation session

**Specific Ideas:**

- Participants should be part of the analysis of data in emotion research. Participants can help create meaning about their emotional state of being for researchers.
- Ambient feedback is a clear and seemingly natural way for users to reflect their emotions - it is easiest to imagine with a mobile phone serving as the guardian and holder of user emotions and then reflecting these back to owners through colour or vibration.
- Phones can also serve as a tool to calibrate emotions for owners to develop a landscape or the range of emotions that a person feels on an average day, week or year.
- Using gesture in haptic technology as another potential mechanism for measuring emotion – through pressure and the type and frequency of movements. With research leaps being made in the arena it remains a great idea but technically too dense to include in the development of this concept.
**SPECIFIC IDEAS**

![User analysis of facial expression + sound commentary](image1)

![Emotion calibration machine](image2)

![Using gestures like stroking and tapping to capture emotion](image3)

*Fig 14. Specific ideas distilled from the ideation session*

The frog parameters for the concept are listed in Table 1 below. These became the guiding criteria for the development:

<table>
<thead>
<tr>
<th>It has to measure</th>
<th>It must</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A range of emotions – including subtle ones</td>
<td>- Adapt across cultures and regions</td>
</tr>
<tr>
<td>- Emotions during specific activities</td>
<td>- Show relationships between emotions + behavioural patterns +</td>
</tr>
<tr>
<td>- The intensity of emotions</td>
<td>environmental stimuli</td>
</tr>
<tr>
<td>- Mixed emotions</td>
<td>- Be deployed remotely</td>
</tr>
<tr>
<td>- Emotion experience on a continuum</td>
<td>- Show results that can be visualized to gain valuable new insights,</td>
</tr>
<tr>
<td>- Responses from many people</td>
<td>spawn ideas</td>
</tr>
</tbody>
</table>

*Table 1 frog parameters for the emotion measurement concept*

**EMOCAMERA**

The Munich ideation session gave birth to a concept titled Emocamera. It is a playful, social and creative tool that gathers knowledge about people’s lived experiences, feelings and hopes in their own words and images. Practically, Emocamera functions as a real-time mobile diary of pictures and commentary. It draws inspiration from popular mobile social picture applications like Instagram and shares the frog Emotion Engine’s perspective of understanding emotional experience in layers. The Emocamera approach, like cultural probe thinking, values a deliberately open space for interpretation.

Now, imagine a parking meter in the city of Amsterdam with a rusty dial as part of its interface. After several unsuccessful attempts to get the dial to register the correct time allotment, the would-be parker throws her hands in the air, exasperated. She takes her
smartphone out her pocket and snaps a picture of the eroded dial and “stamps” it with an angry face using the Emocamera application. Essentially all social experiences have an affective dimension, 39 and we are often eager to share them with others, or record it for validation by others after the fact. Emocamera (unlike other social applications) places emotion at the core of its content and function offering. All user-generated images, words and graphics are aimed at recording and elucidating an emotional experience.

Fig.15 A mock up of how a user would represent frustration and/or anger during an experience using Emocamera

Using the concept of emotion stamps Emocamera has the power to upgrade images into more emotionally competent objects. It has to be noted that the stamps are not part of a validated and rigorously tested system, but a much less serious, playful tool for users to label an experience. The characters’ covert mission is to help with user profiling, providing an informal sense of a person’s average daily sentiment rhythm. 40 In design work, focusing on a character profile with emotions and motivations, can be more tangible as it gives perspective on the kind of scenarios and expectations users have and what design possibilities might be received. 41 In this sense it’s useful to think that Emocamera can function as an emotional profiler as well as a diary-style application. Repeated over time it becomes a powerful way to see patterns – thus adding insight into the connection between users’ motivations, emotions and design for frog researchers.

If designed by frog, Emocamera would offer a bespoke portfolio of characters to users. The selection is purposefully playful and includes characters and icons (hearts or exclamation marks) that are stereotypical pop culture representations of emotion. The layering continues with commentary – in words and drawings. Users can then label a picture with a character instead of words or graphics or all three. The characters would represent emotions across a spectrum of basic emotions (eg. fear, anger, disgust) and more (social) emotions like embarrassment, guilt, shame as well as the more subtle emotions like being content, or intimidated or confident. Unlike PrEmo’s defined character set, Emocamera can continue to gather a library of emotion characters that are user generated – users are able to draw their own. Because a sense of being “unmoved” by a thing, place or interaction is a common feeling in everyday experiences, “neutral” or “no emotion” will also be included as an option.

39 Wetherell 96
40 This assumes they used it over a period of time
What is most valuable to frog is that the emotions need to be descriptive of experiences not static products. Also, the frog team are interested in the landscape and range of emotions over a period of time, to understand how they may change, as well as the context within which they take place and so the format of a diary becomes important. Take the example below of how a coffee-making experience can begin with mild irritation at the after-drip of the machine but end well once a person settles down at her desk to drink coffee. The time difference between the first and second frame is only minutes but it marks important points in an emotional continuum related directly to design features.

![The afterdrip is a cleaning mission!](image)

*Fig.16 A representation of how a user would record a coffee making and drinking experience – it ranges from frustration to content*

Where it can be seen as just a mobile version of a user diary, Emocamera offers a different departure point for frog research. Its value and uniqueness lies in the use of the application. Like a mobile cultural probe it becomes more interesting if respondents use it to tell real-life stories about experiences and in this way, researchers can begin to make sense of their emotional landscapes. The emphasis on labelling emotion shifts the focus away from mechanically recording events but also towards interpreting them, allowing a sense of reflection for users and deeper insights. Or, as frog Creative Director Tjeerd Hoek puts it,

> The main value of such a tool would be to identify in principle hidden or misunderstood triggers/parameters in an experience in a certain context, that suddenly turn out to fairly deeply impact people’s emotional state, well-being, or behaviors. Even if it doesn’t help us to understand how to design something to manipulate those emotions, merely being aware of their existence and having the opportunity to take them into account, or avoid unintended emotions just because we had no idea about some factor playing such a role, that would already be tremendously helpful. So it is more to get at those hidden experience elements or moments that aren’t immediately observable and often also aren’t going to be self-reported on because people only realize them when they occur.42

The tool will translate into a meaningful contribution to the design process through visual stories – ultimately a visual language. In so doing designers can also begin to feel an inkling of what it is like to experience frustration in a store or to be content using a no-fuss coffee machine. The focus is not only on the knowing and doing aspects of interaction design but

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42 Email correspondence, 26 February 2013.
also the feeling. Emocamera denies the straightjacket effect of making users choose emotions that fitting neatly into categories, because people can label the experience in a number of creative ways. Emocamera recognises the power of narrative and processing much like We Feel Fine and it uses the graphic basis of PrEmo to transcend language issues and create another optional layer for labelling emotion. In a futuristic iteration of Emocamera the social aspects of the application can be developed – allowing sharing and commenting giving it the performative edge that Emotish has.

**HORIZONS**

There are rarely absolutes when designing for emotion. The challenge is not small: we need to understand how the design of technologies for everyday life resonates with people aesthetically, emotionally, socially, culturally both with particular users and with a larger audience. For this we need new sources of assessment, ones that are multi-layered, reflecting the very nature of emotion itself. Arguably, The Emocamera represents the perspective that designers require less stringent data in the design process, but rather a rich and even divergent and unresolved set of perspectives. In this way, a story developed using Emocamera can help to envision and create the most successful design for engaging and transforming users in their experience. As sociologist Margaret Wetherell suggests,

…narrative and story-telling are likely to become more important as the body winds down, and as the moment of strong affect is carried forward as a memory or story, with new accompanying affect.

Emocamera is offered as a complementary, not stand-alone item, in an arsenal of research tools. It celebrates the opportunity to create a hybrid model between emotion-as-information and emotion-as-experience. In the context of frog’s work – and their need to understand people’s behaviour during interactions – it seems natural that designers see emotion as an interaction too. That emotion is “dynamic, culturally mediated, and socially constructed and experienced.” This means that even in the analysis of Emocamera data space is made for co-interpreting emotions. Emocamera relies on the premise that the design part of this process is still highly interpretative. That designers will use these image-based stories to see, understand and feel.

Often this new thinking comes at the hand of a very unique, dangerously subjective terrain that lends itself to a creative, more playful tool like Emocamera. While it is almost impossible for anyone to remember experiences in all detail accurately, with Emocamera we acknowledge that memories are never correctly or completely stored in the mind. Affective memories have always been mediated by technology, an inner narrative of desires and needs. These diaries are not to be seen as exact recordings, but as evocative frames. Rather than invoking the experience, they represent triggers of particular emotions or sensations. Elizabeth Roche emphasizes that frog’s research can benefit from learning as much from how people reflect on an emotion as from what they experienced in the moment.

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48 Van Dijck p. 326
Paul Ekman, the leading facial recognition expert said, “We don’t have to choose whether an expression is part of an emotion or a communicative signal. In reality it is both.” So by allowing people to tell stories of their lives, in their own words using an application like Emocamera, the research agenda focuses on the ongoing communication stream of emotional messages, rather than isolating single events in time. While most emotion research methods lean heavily on physiological data, emotions are “both the product of our evolution and of what we have learned, especially our attempts to manage our emotions, our attitudes about our emotions and our representations of them verbally.” So it becomes especially important to treat the making and measuring of emotions with the complexity it deserves. Emocamera remains a paper concept until developed and prototyped by the design and research teams at frog. However, even in concept phase it highlights some important areas for consideration about the role of play in design research, the power of storytelling, the co-interpretation of meaning with users in the analysis of data and the value of keeping spaces open for interpretation.

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A note on terminology
I have alternated between the terms ‘feelings’, ‘emotion’ and ‘affect’ in this paper, treating them as equivalent when they are not. Feelings are sensations checked against previous experience and “labelled”. Emotions are personal displays of feelings shown through things like facial expression and can be genuine or fake. Affect is entirely innate and bodily and autonomic in nature. Affect is transmitted between bodies and, is unformed and unstructured and aroused by factors the individual has little control over. (Eric Shouse, “Feeling, Emotion, Affect.” M/C Journal 8.6 (2005). 14 Aug. 2011 <http://journal.media-culture.org.au/0512/03-shouse.php>.)

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