

LAURIE – what is the sound of red?

Helene Berg, Jonas Ericsson, David Österberg,

*Fredrik Mistander Hans Möller, Lennart
Fröderberg*

No Picnic AB, Stockholm, Sweden

helene.berg@telia.com

Jonas.o.ericsson@gmail.com



Figure 1. Laurie logo in b&w

Laurie is an ongoing research and development project within the field of interaction design.

1. BACKGROUND

The rapid evolution of technology has made the human interaction with various types of electronic equipment a natural part of everyday life. A consequence of this is a constant demand for new features and uses. The project is part of this evolution. Our research is based on human interests and needs in relation to technology.

The project is initiated by Jonas Ericsson at No Picnic AB and realized by means from Vinnova. No Picnic AB is a cross-disciplinary design agency with business in product design, conceptual solutions and materialization of brands. The company has been engaged with development of IT-products for more than 15 years, among other “Walkman” (Sony and Sony Ericsson) and “Pacemaker” (Tonium).

During this work, we have registered how the electronic devices has become more and more effective in communicating with other machines, whereas their ability to communicate emotions and impressions has scarcely been developed at all.

These identified needs have been acknowledged by companies such as Sony and Sony Ericsson.

Our aim is to investigate different ways to develop interfaces that recognize the actions of a user and stimulates a more intuitive, creative and joyful experience. The research is performed in a Lab environment by a cross-disciplinary group with competence in technique, programming, design, sound design, physical expression and graphics. One important condition is that development and research work is integrated rather than, as often happens, hardware and software is being developed in isolation from each other. The goal is to use the group's collective experience of product development, innovation, and artistic expression to produce ideas and concepts and to realize these into physical models. Hands on research will then (hopefully) provide us with research results and conclusions (and more ideas).

As Laurie is an ongoing project this poster will be more of a presentation of our method than of our conclusions.

2. QUESTIONS – matters of investigation

We started out by formulating a series of questions like:

- How can electronic interfaces recognize and communicate emotional intention and qualities?
- How are we affected by impulses from a non-determined tool?
- What stimulates the creative and perceptual ability in this context?

3. METHOD

Tools

The gaming industry provided us with inspiration and technology that we could use as a starting point for the physical interaction. Other sources of inspiration came from sensors developed for measuring athletic performance and from mobile phones. We combined different aspects of these together with artistic expression to design various types of interfaces.

We tried to follow two set conditions;

- a) “No learning curve” and
- b) “Intuitive”

We aim at giving the interfaces their own identity or “soul” which we believe inspires positive curiosity and encourages exploration.

By using already existing computer programming environments for real time generated audio and graphics we could create a base platform for the audio/visual design. After evaluating different alternatives we are now using Quartz Composer (a node based visual programming language provided as part of Xcode development tools in Mac OSX) and Reaktor (a modular sound design programming environment) for generating the real time audio/visual output.

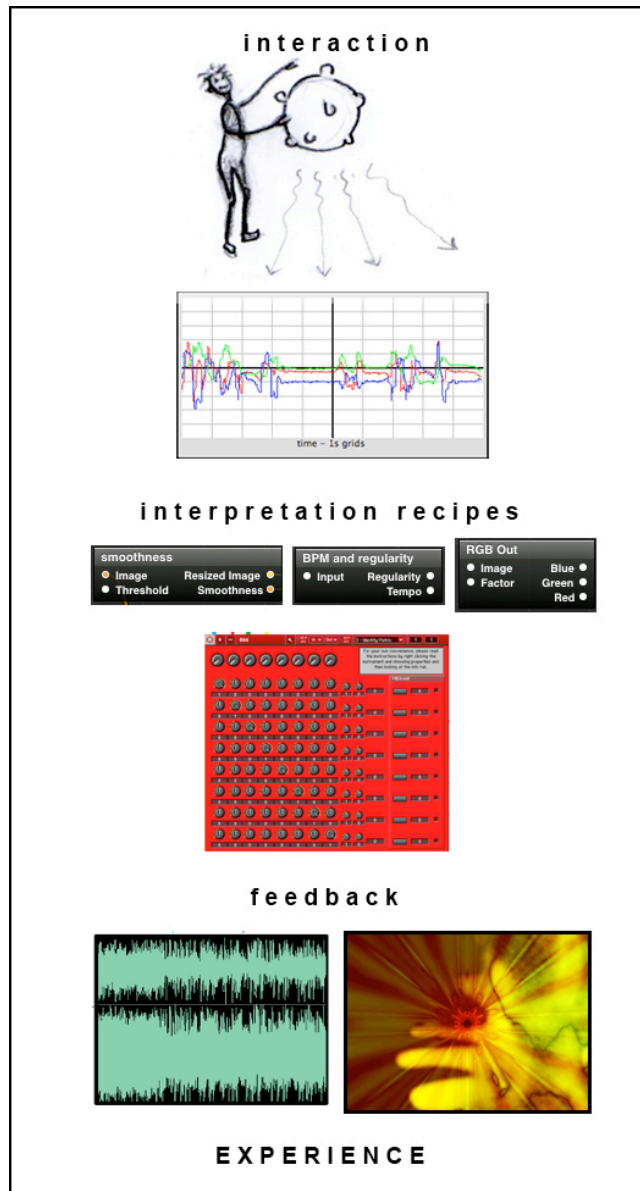


Figure 2. flowchart

The audio/visual output is interpreted and analyzed in terms of emotional content and expression. These results are then being compared with the users intention.

This relation is the core part of the research, - to what extent the user feels that her intention and experience of the action matches the artistic expression of the audio/visual output.

To achieve this, the raw interaction data has to be interpreted in order to affect the artistic expression of the audio/visual output in a relevant way.

As an inspirational and pedagogic model we studied the art of calligraphy where movements can be interpreted dynamically over time. A trained eye can, in a calligraphic drawing, read factors such as brush approach, turns, speed, temperature and pressure and determine the emotional content of the outcome. How can this be achieved by machines?



Figure 3. Calligraphic drawing by Jonas Ericsson

Factors and interpretation recipes

The users interaction with the interface is recorded and constantly updated in real time by accelerometers, various types of sensors and cameras. In order to receive information that is as versatile as possible we need to separate the data from the different event types in the interaction. Examples of event types could be pressure, acceleration, velocity, intensity, regularity etc.

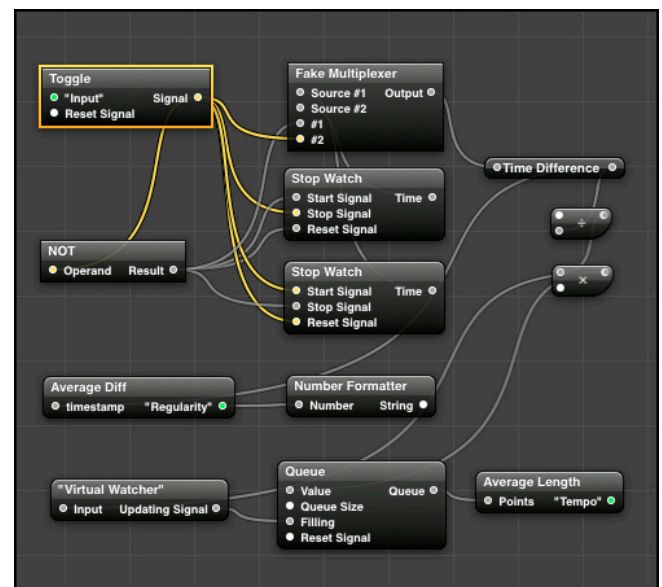


Figure 4. "Identify tempo by measuring regularity in interaction"

A program that identifies peaks in a signal and the interval between them. A signal can for example be transmitted from a sound source or a sensor. The data is used both to measure the tempo and regularity. The regularity can describe how rhythmical a signal is.

The collected data is fed into “interpretation boxes”, a matrix device where the data from the readings affects the output parameters according to a set recipe. Recipes in this context are a way to define to what degree the interaction data affects different aspects of the audio/visual output. For example, to what degree the intensity of a movement affects the audios “sharpness”, or the visuals “color temperature”, or to what degree the derivative character of the data affects the tempo of rhythmical elements in the audio or visuals.

Different interpretation boxes can accumulate events over time in order to make the system more complex and dynamic.

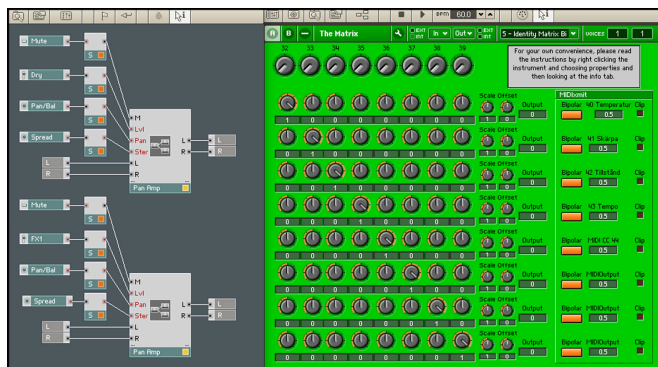


Figure 5. Snapshot from interpretation matrix used to create recipes.

These recipes are entirely based on subjective assumptions as a starting point but then developed and refined in coherence with the users experiences. The goal is to experiment with to what extent we agree on certain principles. Can “universal” algorithms be developed?

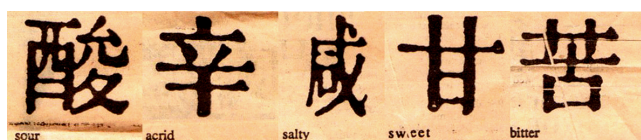


Figure 6. There are not more than five cardinal tastes, yet combinations of them yield more flavors than can ever be tasted. (Sun Tzu : The Art of War).

Feedback

Initially, we have created a number of “scenes” as experimental platforms. We have chosen to use abstract and dynamic audio and visuals, rather than tonal and illustrative. The aim is to enhance user responsiveness. If she does not recognize what she hears or knows what to expect, her participation will be more open and intuitive.

Haptic feedback provides another mean by which the user can be stimulated and led thru the experience. Rules for how dramatic events develop can be created.

Another important element in the design of the system is that the audio/visual output never should repeat itself in order to stimulate the user to explore the scene again and again.

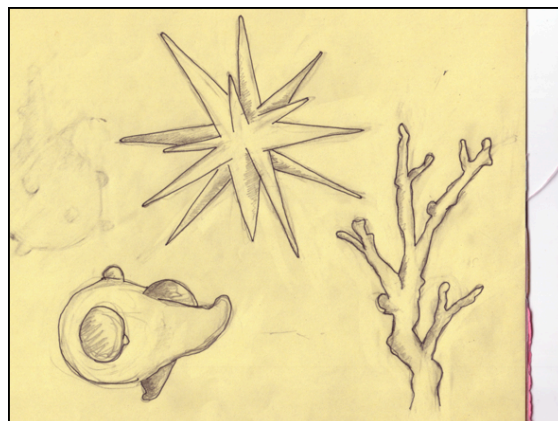


Figure 7. sketch of early models
We want to investigate how physical expressions like for example color, shape and material influences our relation to the technique.

Impulses from a non-determined tool

Unlike a determined (predictable) tool, where we have an expectation of what result we can achieve, a non-determined tool represents the unknown. When we cannot associate the experience we can create conditions for curiosity and surprise (the unexpected).

In the project, we have chosen to create non-determined interfaces where the user is stimulated in the physical interaction through the haptic and audio-visual output. The aim is to create a sense of exploration and a discovery.

The human-technology relation is directed towards a dialogue or improvisation. In the perspective of product development this can be perceived as giving “life” or “character” to an interface or a product.

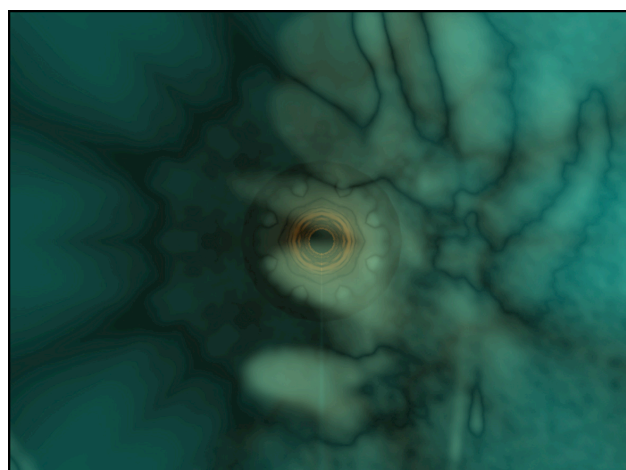


Figure 8. Snapshot interactive visual output

Stimulation of creative and perceptual ability

As children, most of us have a relatively straightforward relationship to our ability. A four or five year old sitting in front of a piano or a drum kit rarely feels limited by what could be right or wrong. The experience of delight in the outcome is not

influenced by valuations or judgment. This open minded attitude and ability tend to diminish with age and are replaced with uncertainty of doing "wrong". In an artistic context this feeling of uncertainty can be reinforced even more.

Our ambition is to create tools that stimulates enthusiasm and curiosity rather than performance anxiety.

Through investigating how interactive tools can encourage a open minded attitude of joy and playfulness we can collect knowledge about methods to develop and design tomorrows electronic interfaces.

4. AIMS AND CREDS

Laurie can be regarded as an ongoing concept study and research lab where different mockups and applications are being developed as tools for interaction design research and development. The fact that these tools and applications often suggest other uses than the initial objective is an outcome that provides the project with more ideas that can be further explored and developed. Possible areas of use include, applications for mobile phones, the music industry and digital art, ideas and concepts for the gaming industry but also as rehabilitation and communication tools for disabled or old people.

The cross-disciplinary group that develops Laurie consists of:

Jonas Ericsson (innovator and industrial designer)
Helene Berg (visual artist, mime artist)
David Österberg (sound designer, music producer)
Fredrik Mistander (hardware architect)
Hans Möller (software developer)
Lennart Fröderberg (software developer)

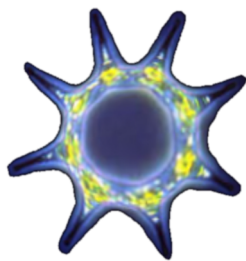


Figure 9. *Laurie Logo in color*