Interpretation of sensor data: can we relate it to emotions ?

Nicolas Déflache, 2008*, for eNTERFACE '08 workshop, project #5: Capture and machine learning of physiological signals for emotion recognition: applications to performing arts and multimedia scenography.*

Emotion is a complex phenomena that no conceptual theory describes at a sufficient level at the moment. It involves percepts as well as cognition (concepts), conation (impulse) & affects (feelings, physiological systems). Everyday language provides a managable simplification of concepts & experiences.

Emotional life is a large and complex space that we can't represent completely, because of technical, conceptual and experimental limitations.

- technical: we need to be aware of what the multimodal inputs we have are capable of describing. We realise we have few parameters and they are superficial.

- conceptual: are we interested in basic emotions that statistically occur more often (scientific approach), or are we going to fit subjective needs (artistic approach) ?

- experimental: there is no obvious link, and we don't have knowledge to link measurements to the inner emotion of the human being sensed.

A subject found in a measured state equivalent to a state in which he was before does not mean that he is going through the same particular emotion. Inversely, being in a particular emotional state could result in a comparable measure, even though it is not necessarily the case. Anyway, it would require one step more of analysis to link the representation to an inner emotion.

So, what is represented and what is not ? Are we recognizing emotions, are we recognizing concepts, or are we recognizing face expressions + sensor features ?

With an artistic approach, it is possible to rely on the feedback of the multimedia result on the performer's perception to create a link between captation and actual inner emotion. If expressivity is placed at a sufficient level to allow this loop to exist, the performer adresses directly to the multimedia content, that includes things we wouldn't normally acceed, because the performer isn't even conscious about. Because it is explicit, this is the only space where we know where we are.

Thus, we need a system of representation with emphasis on experiential description.

Intuitively, we proposed to use the Activity / Valence reprensentation, that we assume to be a broad enough concept to fit the view of several artists, or at least to be of interest for them. This representation is not describing the context (environment, cognition, affect...) but taking it into account. Emotional life is divided into 4 poles, 4 poetic worlds, that the artists describes with general sentences.
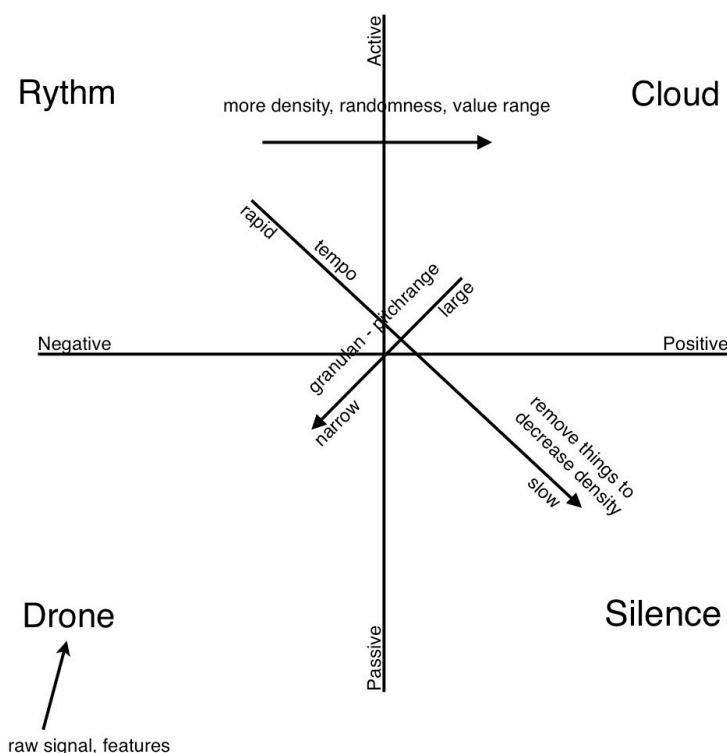

Figure: An example of a poetic world mapped to sound generators