

Induction and Evaluation of *Affects* for Facial Motion Capture

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In this study, we are interested in capturing the facial configuration of *Affects* in order to use them for Embodied Conversational Agents. In order to create a believable ECA, it is necessary to capture natural *Affects* that can be learnt and replayed. However, until now, animation data are extracted from videos and their description is far from being sufficient to generate realistic facial expressions. It seems that believable results cannot be obtained without using 3D motion capture. This is why in this study we tried to set up a protocol for *Affects* induction in a motion capture situation with manipulated subjects who are unaware of the real goals. Similarly from [1], we induce natural *Affects* in order to capture the related facial expressions.

The protocol we have developed is inspired by the *Social Interactions* technique [2]. This technique postulates that the behavior of other people has an effect on our own emotional state. In this study [3], we have chosen to put the subjects into a video conversation situation where they have to sell theatre seats for a play. They have been told that they were here to test the ergonomics of the software. The customer is actually an associate who plays a predefined *scenario*. This protocol was first conducted on videos only, the subject being recorded by the webcam. Once the protocol proved its efficiency, it was adapted to motion capture. Fourteen subjects were equipped with 99 markers glued onto their faces. The make up took almost an hour during the one subjects had time to get used to the equipment and to forget the markers stuck on with an very elastic glue. The subjects were told the same things as in the first experiment and the need for the markers was explained by the fact that the customer was not seeing a video but a real time animated character thanks to their faces. Five *scenarii scenario* selected: Satisfaction, Amusement, Embarrassment, Misunderstanding and Surprise.

The sequences have been auto-evaluated by the subjects and are being evaluated by 80 independent judges. When considering the auto-evaluations the *Affect* which was generally most experienced was the target *Affect* but it is composite most of the time. For example, for the Satisfaction *Affect*, subjects describe a feeling made up of Joy, Satisfaction and Amusement. Moreover, the *Activation*

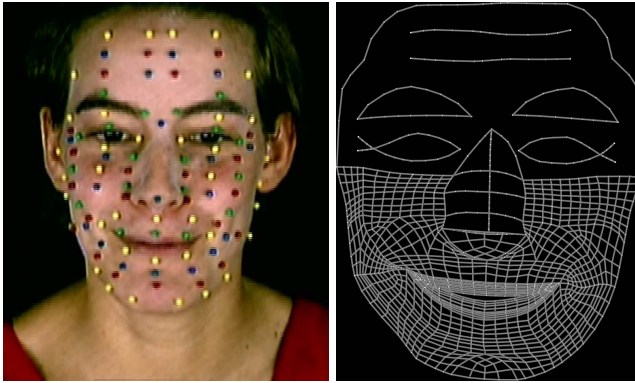


Fig. 1. Subject with markers on and the corresponding 3D motion captured data

levels are not very intense, but rather moderate. It is possible that the subjects have been impressed by the equipment and maybe held back their feelings. Some subjects also reported that they really wanted to achieve the task seriously and that it was not very professional to express his feelings. For the independent evaluations, it has been decided to present the sequences to be evaluated under four different modalities. The three first ones use the *Point Lights* paradigm [4] and the fourth one is the raw video with the markers. The three *Point Lights* sequences are built into assumed increasing intelligibility levels. Results show that it is not easy to capture and replay subtle *Affects*. In many cases, the selected *Affects* were not really recognized by judges. However, they could be clustered into two *meta*-groups according to their positive or negative *Valence*. Also, we obtained rather low *Activation* levels showing that the *Affects* were not fully expressed. This certainly comes from the fact that we are not studying basic emotions like many authors do. This is particularly obvious when considering the Surprise *Affect*, for which the expression is different from the common description found in literature.

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