

Facial and Bodily Expressions for Control and Adaptation of Games (ECAG'11)

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Abstract—Novel sensors open up new avenues for facial and bodily interaction, either consciously and unconsciously. In the former, a user controls the interaction, whereas in the latter, the interaction is adapted based on observations of the user. In the second International Workshop on Facial and Bodily Expressions for Control and Adaptation of Games (ECAG'11), challenges in using body and face in interaction are addressed.

I. INTRODUCTION

Expressivity in the human body and face can serve to control or adapt interaction with a system. Examples are controlling game characters using body movements, gesture interaction with a robot in a home environment, or adapting teaching strategy in a tutoring application based on detected frustration or boredom. In these examples, observations of the face and body are used in different forms, depending on whether the user has the initiative to control the interaction or whether the application takes the initiative to adapt to the user. We distinguish between these two ways of interaction:

Control The user consciously produces facial expressions, head movements or body gestures to control a game. This includes commands that allow navigation in the game environment or that allow movements of game characters or changes in their appearances (e.g. showing similar facial expressions on the character's face, transforming body gestures to emotion-related or to emotion-guided activities).

Often, this type of interaction replaces traditional interaction with mouse, keyboard or controller. However, there are clear differences between the two. First, the human body and face are highly expressive and, under the right circumstances, allow for much more accurate and fine-grained control. The body and face are suitable controllers, especially for the control of human characters in games and simulations.

Second, physical use of body and face movements for control has been shown to increase engagement in the game or simulation [3]. In addition, physical control can be fun.

Adaptation The gamer's spontaneous facial expressions and body poses are interpreted and used to adapt the game to the supposed affective state of the gamer. This adaptation can affect the appearance of the game environment, the interaction modalities, the experience and engagement, the narrative and the strategy that is followed by the game or the game actors. In general, observation of a gamer's face and body are done in parallel to (conscious) control.

II. CHALLENGES

Novel, low-cost interaction devices such as Microsoft's Kinect, Nintendo's Wiimote and balance board, Sony's Playstation Move, but also the availability of cameras in a wide range of systems, including mobile devices and televisions, open up the possibility of (bodily and facial) interaction anytime, anywhere. Given these new sensors, we need to understand what we can measure. This requires, on the one hand, robust measurement of bodily and facial activity and, on the other, understanding of these measurements in the context of the interaction. Moreover, these novel sensors pave the way for novel applications.

III. WORKSHOP

The second International Workshop on Facial and Bodily Expressions for Control and Adaptation of Games (ECAG'11) addresses the above topics. Ahad et al. [1] present novel robust methods for human action recognition, Shan [4] introduces a novel, real-time approach for smile detection. Shen et al. [5] introduce a system that facilitates rapid development of interactive systems. Geigel and Schewpe [2] describe many examples of their work on control of virtual characters in theatrical performances. Invited speaker André Galgalowicz discusses the on-line control of the semantic expressions of an avatar from a single camera.

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