

Using Games to Model and Recognize Interactions

Monday, 21 May 2012

Presenter:

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Tutorial Programme/Overview

The tutorial will be divided in the following axes, corresponding to the concepts in the title:

- User models for game play
 - Modelling prototypical player and non-player characters
 - Emotion and games: inducing and expressing emotions
 - Requirements for natural and intuitive interfaces
 - User, environment and interaction context
 - Modelling and measuring player satisfaction
 - Player-adapted content creation (e.g. opponents for individual players)

- Emotion, affect and behaviour
 - The characteristics and intricacies of multimodal interaction
 - Available modalities in natural human-computer interaction
 - Your body (and face, hand, speech) is the controller: the low-tech edition
 - Semantics of modality fusion
 - Behavioural cues, non-verbal interaction

- Game-based corpora
 - Game genres and characteristics
 - Elements of captured user expressivity
 - Design issues in game-based corpora
 - Inducing emotion with games
 - Measuring behavioural, affective and cognitive aspects during game play

- Lessons learned
 - Aesthetic vs. expressed emotions: the Callas project on emotion in arts and entertainment
 - Serious games for observing and learning social skills: the Siren project
 - Play, record, recognize: non-verbal interaction with a Super Mario Bros clone

Tutorial Description

The advent of ubiquitous sensors, computing power and natural interfaces in the form of hand-held devices enables users to interact with computers, gaming consoles and portable devices in a human-like fashion, surpassing the conventional paradigm of keyboards, mice and hand-held controllers. This emerging paradigm opens up new means of non-verbal communication: users can shrug their shoulders to indicate indifference, nod when agreeing or shout when angry, thus producing feedback which computing systems can take advantage of to provide a truly natural and personalized experience.

In the framework of human-computer interaction, this opens up an opportunity to explore those games as a research medium: the Flow Theory of Optimal Experience developed by Csikszentmihalyi gets its name from the way so many people have described a peculiar state of extreme happiness and satisfaction, being so engaged and absorbed by certain activities that they seem to “flow” along with them in a spontaneous and almost automatic manner, being “carried by the flow” of the activity. As a result, play becomes not the opposite of work, as is sometimes considered, but is actually sometimes synonymous to it: for instance, children seem to learn infinitely easier when the learning objectives are achieved through play than when forced into the conventional study paradigms.

This tutorial aims to introduce games not as a leisure or entertainment activity, but as a research medium. Natural interaction and expressivity, personalization starting from the user interface, all the way down to producing individual game content based on what the user enjoys, accessible computing and aesthetic emotions are concepts which can benefit from studying user behaviour and expressivity when playing games.

However, in order to bridge the gap from low-level observed signals (audio, video or even biosignals) to affective and behavioural cues, one needs to map extracted features or cues to user characteristics, taking into account background information or user and environment context, e.g. a smile from the user may be interpreted as positive feedback by a gaming environment, while a frown may indicate that the user has a hard time with the particular game stage, while concepts from cognitive theories, e.g. Theory of Mind, can prove valuable when trying to reason about the beliefs, desires and intentions of the user. As a result, research and development of games are not confined to one single discipline, but instead compose an exciting and challenging inter-disciplinary field.

References:

- [1] N. Shaker, S. Asteriadis, G. Yannakakis, K. Karpouzis, "A Game-based Corpus for Analysing the Interplay between Game Context and Player Experience", EmoGames workshop, ACII2011, October 9, Memphis, USA.
- [2] S. Asteriadis, N. Shaker, K. Karpouzis, G. N. Yannakakis, "Towards Player's Affective and Behavioral Visual Cues as Drives to Game Adaptation", LREC Workshop on Multimodal Corpora for Machine Learning, Istanbul, May, 2012.