Using games to model and recognize interactions

Afternoon session – Monday, 21 May 2012

Speaker

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Short description

The advent of ubiquitous sensors and computing power and, especially, natural interfaces in the form of speech-based commands or hand-held devices enables users to interact with computer, 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 addition to this, seasoned gamers and casual users can interact with computer and console games in the same manner as they would when playing a conventional physical or mental game.

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.

The inter-disciplinary nature of this field has been recognized by authorities such as European Union's Directorate General on Information Society and Media (DG INFSO) which introduced gaming as a research objective across different research areas: ICT, e-Health, Technology-Enhanced Learning and recently Digital Content and Libraries. Another indication of the interest in affect related research is the fact that related papers appear in more than 20 conferences across disciplines (more than 90 for general-purpose affective computing applications) and almost 15 special issues in high-impact journals have been published or prepared; the momentum led to the formation of Special Interest Groups in IEEE (Player satisfaction) and the Humaine Association (http://emotion-research.net/), a follow-up initiative of the Humaine Network of Excellence which also backs IEEE Transactions on Affective Computing, while Springer and other major publishers already publish journals in the field (e.g. IEEE Transactions on Computational

Intelligence and AI in Games, IEEE, Entertainment Computing, International Journal of Computer Games Technology etc.).

Intended audience

Researchers in the fields of human-computer interaction; image processing, computer vision, speech processing; machine learning and neural networks; assistive computing

Tutorial outline

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
  - Concepts from psychology: beliefs, desires and intentions in gaming
  - 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
  - What else can we recognize? What can't we?
- 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