

## Co-operation profile details from Enterprise Europe East of England

### 10 GB 41n8 3G29 - Automating the detailed emotional expressions of avatars and digital characters

#### Technology collaboration OFFER

#### Abstract

A UK start-up has technology to animate emotional responses in digital characters in real time. Group and social behaviour of characters is possible to be animated for the first time. Time and money saving in animation is huge. New genres are now possible in animation, gaming, virtual worlds etc. The lightweight algorithmic kit will also run in mobile applications. Developers of games and animation are sought for commercial agreements with technical assistance.

#### Description

Content production is the largest cost in developing a digital game or directing an animated movie. Much of the work is still being done manually, creating and animating the characters. Creating the scenes such as virtual cities is relatively easy these days but not that of characters. The way they are currently made includes a small number of pre built animations with a small number of moving parts per animation that are triggered by a custom built system that can only handle a small number of states.

There is huge pressure on the gaming and film industry to produce ever more lifelike characters. A lot of research has been done into expressions and personality and this has cleverly been used to model characters that are emotional. As the next step, the term affective gaming has been coined, encompassing emotionally interactive characters and situations. Primarily in universities, some semi-automated solutions are being proposed for affective gaming.

Based on long experience in computational neuroscience, a UK start-up has taken an unconventional approach with very interesting consequences. Instead of observing the emotional states and expressions and modelling them, they have started from inside, i.e. the impulses from the brain that change the physiology.

A comprehensive set of physiological processes has been modelled that not only follows the facial expression but also the posture, breathing, blinking and turning of the head. A mix of pleasure, surprise, excitement etc can dynamically be changed, in real time.

See figures 1 and 2 for the start and end of a sequence in an emotional response. These do not represent a small number or predetermined choices. There is a gradient choice from neutral to extreme for any emotion. Thus the variety is practically unlimited. If need be, the animators can further tweak the character. All the frames in between can now be computed automatically and on-demand. The pace and depth of change is very easy to set and reset. The savings in cost and time for content developers can be thousand fold!

Also, the triggering of emotional responses and interaction can be programmed with ease. For instance, a scream from one character (or the player) can trigger fear and turning of heads from characters nearby. Gaming has just become much more engaging. With state of the art, no response actually happens. Entirely new genres can be started in game production.

The company is in the first joint production with a gaming company. Other applications include animation, serious gaming, simulation, social gaming, advertising (think of an avatar that reacts to an approaching customer, in a lifelike manner) and possibly telemedicine. The company is also interested in exploring partnerships with developers of locomotion technology in animation.

Importantly, the kit is lightweight and barely adds to CPU load. It works in real time. Thus it will find a place in mobile gaming as well. The company does not develop characters, - DESCRIPTION CONTINUES ON NEXT PAGE>>>

#### Target partner expertise sought:

- Type of partner sought: industry
- Specific area of activity of the partner: developers of digital content, especially gaming, animation, avatars
- Task to be performed by the partner sought: for game developers, a software development kit will be given accompanied by technical support, training and adaptation to specific needs. For animators, a plug-in comes off the shelf for which technical support is provided.

Country of origin: United Kingdom

Listed under: Information Processing & Systems

#### Key dates:

Profile created on: 13/01/2010

Closing date: 31/12/2010

**To find out more, contact Enterprise Europe East of England on 08457 1716 15 (select option 4) or email us at [enterprise.europe@businesslinkeast.org.uk](mailto:enterprise.europe@businesslinkeast.org.uk) quoting ref 10 GB 41n8 3G29**

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CONTINUES >>>the technology is added on top of existing production. It works in 2D as well but the savings are not as drastic there.

Innovative Aspects:

The innovation lies in how computational neuroscience has been applied in the modelling of the physiology of emotional states.

The advantages include:

- automatic and real time calculation of emotional digital characters, meaning an up to 1000-fold saving in time and cost
- for the first time truly interactive emotions are being built into characters and a social dimension introduced. This will allow for totally new genres to be started in gaming.
- a lightweight kit allows for even mobile applications.