TECH TO BUSINESS

CONTACT: ipm@innovatecalgary.com • (403) 284-6400

Motion Swarms: Video Interaction in Complex Environments

TECH ID #: 501.3

Background

Researchers at the University of Calgary have developed a motion-based computer vision system for user interaction that is especially well suited for complex environments. This computationally light system is ideal for applications where traditional movement detection-based interaction systems struggle, such as outdoor spaces, and it can easily accommodate multiple simultaneous users of up to a virtually unlimited number.

Through creative design of the particle physics involved in the interaction environment, the Motion Swarms system can be adapted to a wide variety of applications. It has been used for interactive swarm art, interacting with single users up to whole crowds. It can also be used to implement GUI objects such as sliders, buttons, dials, and menus, which can be combined to build a fullyfunctioning user interface. In addition, the system can be used to design video games that require no controllers for game play.

Areas of Application
- Digital interactive signage and kiosks
- Art installations
- Video games

Competitive Advantages
- Easily interacts with any number of users simultaneously, from large crowds down to a single user
- Ideal for complex environments such as outdoor areas where there may be background movement, changing light levels, and other uncontrollable variables
- Computationally light

Stage of Development

The Motion Swarms system has been used in a number of interactive swarm art installations. Numerous GUI widgets have been implemented, and some video game applications have been developed.

Intellectual Property Status

- Patents: US20090087032, US20110276922

Publications

- Nguyen, Q., et al., "Motion Swarms: Video Interaction for Art in Complex Environments", Multimedia'06, October 23-27, 2006, Santa Barbara, USA, pp. 461-469.
- Boyd, J., et al., "Video Interaction for Swarm Art", MAST'09, January 29-30, 2009, Santa Barbara, USA.
- Boyd, J., "Motion swarm widgets for video interaction", WIAMIS'09, May 6-8, 2009, London, UK, pp. 97-100.

Videos

- Video 1 – Summary [Youtube]
- Video 2 – Interaction [Youtube]
- Video 3 – Poetry Pong [Youtube]