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Ascension product: Flock of Birds

*"We selected Ascension's Flock of Birds for use in the lab because [it gives us] the level of accuracy we needed." -- Dr. Cyrus Shahabi*

## **UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES: INFORMATION LABORATORY AND VIRTUAL ENVIRONMENTS LABORATORY**

Several years ago, University of Southern California's (USC) Dr. Cyrus Shahabi realized that the moment by moment exchange of cues and responses between computers and the devices humans use to interact with them contain vast amounts of untapped information. From there, Shahabi launched his research, exploring the future of the human / computer interface.

As director of the USC's Information Laboratory (InfoLab), Shahabi and his group investigate the interaction between humans and virtual environments. One of the greatest challenges they face involves management of the multidimensional sensor data streams—termed "immersidata" by Shahabi—generated within immersive environments. Because immersive applications have many common data management needs, developing a general-purpose system for the management of immersidata is the group's objective.

While Shahabi and his team study immersidata management, their practical research provides insight into a variety of potential immersive applications. The interdisciplinary team found that children thought to have Attention Deficit Hyperactivity Disorder (ADHD) could be accurately diagnosed by analyzing signals from the hand and leg-tracking devices and immersion goggles they wore while exploring virtual environments. Just as an aircraft simulator tests and trains piloting ability under a variety of systematic and controlled conditions, virtual environments facilitate ADHD cognitive study and training.

For the ADHD studies, the InfoLab team uses Ascension's Flock of Birds. According to Shahabi, the lab chose the Ascension tracking system because it provided the accuracy needed and was cost effective. Shahabi and his collaborator, Dr. Albert "Skip" Rizzo, designed the project to use three Flocks to track and measure movement.



The Virtual Classroom used in these studies consists of a rectangular room with desks, blackboard, side wall with a large window and opposite wall with doorways.

The student wears a Head Mounted Display which is ideal for blocking outside distractions and controlling stimulus in the environment. The three Flock of Birds trackers not only drive the graphics display in the HMD, but they serve to capture body movement metrics from the tracked locations as well. This

provides important quantitative data on the hyperactivity commonly observed with ADHD.

"These data suggest that the Virtual Classroom has good potential as an efficient, cost-effective and scalable tool for conducting attention performance measurement beyond what exists using traditional methodologies," explains Rizzo, Shahabi, et al in their paper *The Virtual Classroom*. "The capacity to

integrate measures of movement via the tracking technology further adds value to this form of assessment when compared to traditional analog tests and rating scales.”

Another recent InfoLab project combined a two-sensor Flock of Birds with 5DT Data Gloves to create a two-handed gestural interface. Similar to the hand movement controlled interface depicted in the popular film *Minority Report*, the InfoLab actually synthesized a working interface. The user controlled a computer display by mere gestures: play, pause, screen size, capture, stop and application exit were all commanded by simple movements of the hands and arms.

The InfoLab team views immersive sensors as *the* user interface of the future because they facilitate natural interaction between the user and the computer, as in the gestural interface. To see this remarkable achievement in the development of human and computer communication, view the streaming video available at <http://imsc.usc.edu/movies/demos/view-aims/viewaims.wmv>.