

INTERACTION IN 3D VIRTUAL WORLDS: AN INTEGRATED APPROACH OF EMERGING TECHNOLOGIES IN HANDBALL

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Summary

Lifelong learning is a concept that is associated with changes in society as we know it. The new technologies of information and communication have contributed to the creation and development of various tools in the training, education and research in several areas. 3D virtual worlds are alternate realities in which people can interact with each other or elements present in it. In the field of education is recognized primarily by its potential ability to simulate complex situations, work collaboratively and also by "humanizing" the access and the transmission of knowledge asynchronously and synchronously.

The purpose of this communication is to present:

- the experiences acquired so far in handball, using the 3D virtual world of Second Life[®] as a training environment, and;
- an integrated view of various emerging technological resources to assist coach, coaching and competition situations.

Keywords: *Handball, Virtual Worlds, Artificial Intelligence, Interaction.*

3D virtual world as a training and coaching environment

3D multi-user virtual worlds are alternate realities where the people interact with each other and on elements present in it. In the field of training and education it recognized its potential, by a diversity of educational institutions. Virtual worlds are presented as alternative educational environments for the presentation of simulations, used to conduct experiments in adverse and expensive conditions, and sometimes impossible to be carried out in reality. 3D multi-user virtual worlds are technologies that present new possibilities for synchronous and asynchronous collaborative work, but also towards the improvement and humanization of access and transmission of knowledge through the Internet, and too having been playing an important role in developing strategies for innovative and effective teaching-learning (Morgado, in press; Warburton, 2009).

In sports context, an aspect of particular interest is the reproduction of dynamic aspects of the interaction of the game, allowing a better understanding of its characteristics. There is the ability to demonstrate the tactical issues in different perspectives and also on the modification of ongoing tactical procedures in real time. This technology has been tried out in the creation and simulation of 3D handball movements (Lopes, et al., 2009ab). The 3D virtual world Second Life[®] has been the choice since it has allowed an accessible way to study the process of teaching online, the software implementation

and the integration of motion captured handball movements in to bots in the virtual world.

In this regard have been developed: training activities to analyze the interaction between the trainees and the trainer; implemented software for the coach to interact with 3D virtual world simulator; and captured the movements and gestures of technical actions of players to produce handball animations to be simulated in the virtual world.

Training activities have been conducted in the virtual world Second Life ® in the form of synchronous classes (webinars), in which later took place content analysis of the chat logs of the participants, in order to verify the process of interaction between them and issues related to handball (Lopes, Sequeira & Rodrigues, 2009b; Lopes & Sequeira, 2010). Simultaneously, it has been developed software so that the future trainer/coach can use and control pre-programmed bots to perform 3D simulations of technical and tactical handball game situations (Lopes, et al., 2009). This will allow the trainer during to use the bots to simulate in real-time 3D tactical situations and adapt them to the educational and training needs, and that can be viewed from many perspectives (first person, blimp or bird eye view, coach/player by position view) and simultaneously interacting with them. For the simulation of handball gesture and movement to be closer to the real life ones, it has being captured the basic moves of the sport through MotionCapture ® (Lopes, et al., 2010).

An integrated view of emerging technological resources

The coach activity is essentially a social one, mainly constituted by the interaction between players and coaches (Jones, Armour & Potrac, 2002). During a game the coaches have to make several decisions, many of them critical and irreversible, with a high degree of uncertainty and on pressure (Salmela & Moraes, 2003; Sequeira, Rodrigues & Hanke, 2006). The use of specific knowledge of the sport appears to be consensus for successful coaches (Gilbert & Trudel, 2004). The proposal here presented plans to integrate and use a set of emerging technological innovations that simultaneously: record the actions of the game, simulate and analyze real-time in a sustainable way.

By studying the behavior of players and teams in the competition is possible to evaluate a team tactics and technically and transmit information back to the coaches and players, and to organize and develop databases for modeling (Hughes & Frank, 1997), thus define strategies to work.

The use and inclusion of technological means to collect information of the handball game has increased. The widespread use of gadgets such as smart phones and tablets enables us to foresee the need for adaptation and use of the potential of 3D virtual worlds in these devices. It is believed that the widespread use of such devices combined with 3D virtual worlds is a key factor in the process of communication and interaction of a team, either in a state of preparation, competition and/or training.

It is known the absence of a combined system, which allows a coach during a training session or game, ask playback of 3D sports movements, stop or resume as if it were a movie, involving the working group in the analysis of the game situation from different perspectives (Lopes et al, 2009).

Experience with VideObserver (www.videobserver.com) in systematic recording and simple statistic analysis of objective variables in real time, has demonstrated the feasibility of transmitting data in real time to an online platform. The VideObserver allows you to collect a wide range of technical and tactical data, which can be customized by the viewer, and to connect them in to match video. The major innovation and advantage is the simplicity of recording and the detailed data that can be obtained in real time.

The objective of wide data recording allows analyzing the complexity of the game of handball and even to simulate game situations. The simulation can be performed, for example by models of neural networks and their representation in a 3D virtual world online. This 3D simulation can be applied to training or competition situations, enhancing the development of solutions or the presentation of trends in game.

Once the needs and objectives of each of the sports agents are different the development of such technologies should consider the possibility of creating personal virtual environments.

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