

# The Role of AOSE on Serious Games

Alma Gómez Rodríguez and Juan Carlos González Moreno and Francisco J. Rodríguez Martínez

**Abstract** Lately, serious games appear as a very useful tool to learn how humans interact with their environment. The best serious games are simulations that have the look and feel of a game; but correspond to non-game events or processes, including business and military operations (even though many popular entertainment games depicted business and military operations). On the other hand, one of the purposes of Agent-Oriented Software Engineering is to create methodologies and tools that enable inexpensive development and maintenance of agent-based software. The relation between serious games and Agent-Oriented Software Engineering is clear taking into account that: Software (maybe intelligent) Agents are used as artificial players or actors in many computer games and simulations, agent paradigm has a great interest in social behavior and interaction among agents (that can be thought as players in a game), development process for agents is very close to games development.

## 1 AOSE for Serious Games

Nowadays the term *serious game* is broadly cited and used on the research community, but the concept is not new, *Clark Abt* discussed the idea and used the term in his book *Serious Games* [?], paying attention primarily to the use of board and card games. Nevertheless, he gave a useful general definition which is still considered as applicable in the computer age:

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Alma Gómez Rodríguez  
Computer Science Department, Vigo University, e-mail: alma@vigo.es

Juan Carlos González Moreno  
Computer Science Department, Vigo University, e-mail: jcmoreno@vigo.es

Francisco J. Rodríguez Martínez  
Computer Science Department, Vigo University, e-mail: franjrm@uvigo.es

”Reduced to its formal essence, a *game* is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context. A more conventional definition would say that a *game* is a context with rules among adversaries trying to win objectives. We are concerned with serious games in the sense that these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement.

More recently Mike Zyda [?] provided an update to the definition:

A Serious Game: is a mental contest, played with a computer in accordance with specific rules that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives.

Although serious games can be entertaining, their main purpose is to train, investigate, or advertise. Moreover, the category of serious games for training is also known as *game-learning*.

From this definitions the role that Agent Oriented Software Engineer (AOSE) may play on the development of such kind of games could be deduced. An agent can play the role of adversary or collaborator of a player in a serious game. Moreover a serious game may be mainly a Multiagent System simulation that could run without human intervention. Several AOSE approaches like Electronic Institutions [?] or Agent-Based Simulation of Social Values [?] could be used on the implementation and formalization of the game rules and on the simulation of the social behavior to be accomplished.

These points are important in the implementation of a *Serious Game* and are good challenges for AOSE, but there is still much more issues, related with AOSE research, to be considered on the development of such kind of games. Our main interest is from the point of view of the development process support; that is, the actors, scenes, context, light, cameras, and the environment (i.e. virtual world) in which the game take place, must be developed using some Software Engineer Methodology and adopting a well known development process. Nevertheless the process and methodologies that are applied on the industry at present tend to be sequential, traditional, and don't include tools that could automatize the gap existing from the model specified to the code that must be implemented.

The introduction of some methods and tools for a real 3D implementation of such kind of games is in its beginnings (see [?] as good approach to it) but the application of agile and lean techniques needs to be formalized taking as basis an AOSE methodology and comparing it with traditional methodologies in order to define an accurate way of developing this kind of applications.

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