From the Editors: Games and Simulation

Games and Simulation: *DS Online*'s Newest Topic Area

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Games and human society go hand in hand. Society wouldn’t be the same without games, and they’re integral to most people’s lives. Many skills can be involved and developed in the processes of imagining, designing, learning to play, and playing games. They’re a general way of exercising our brains, they can be useful for training, and they’re important for social interaction. Games are changing, and the mass use of computerized IT for playing games has a reasonably short history. The related processes of modeling and simulation attempt to understand and explain our origins and our past and present, to forecast our future, and to consider our destiny.

Games and simulations are becoming serious business with serious applications. They’re being used in more and more public and private realms, and furthermore, results from these games and simulations are increasingly affecting real-world affairs. By association, the demand is growing for knowledge about the design and application of games and simulations, especially for serious applications. This demand currently far outstrips supply—knowledge is dispersed over many organizations and business and academic disciplines, it’s strongly individualized, and it’s often anecdotal, lacking clear, consistent design and application guidelines.

To help remedy this situation, we were appointed as editors for a new *DS Online* topic area on games and simulations in September 2006. In December 2006, the topic area’s first page was linked. In March 2007, we had our first editorial meeting, coming face-to-face to develop a coherent strategy. With this topic area, we aim to create a platform that brings knowledge together and makes it accessible. By providing this platform, we hope to contribute to building better, more effective games and simulations, making their applications more effective, and improving their results.

Ambition and professional development

Any time a new technology or science is discovered, standards eventually evolve to define the concept and the languages to discuss it, as well as to determine the best practices for building and creating with it. Games and simulations have been around for a very long time and have been seriously used for at least 200 years. So it’s about time that we articulate and share our combined knowledge and experience to improve the state of the art in the design and application of games and simulations, especially as their use grows exponentially and their results are applied to real-world problems.

At the moment, knowledge and experience in game design and applications are dispersed over many different user communities, design companies, and academic disciplines. If we want to raise the state of the art, we must bring together this vast amount of knowledge and experience. In this manner, we intend to become the premier Web site for collecting, sharing, and transmitting games and simulations knowledge and experience. We hope to facilitate, support, and improve access to and use of this knowledge and experience.
Intended audience

Our topic area is intended for a broad audience of designers, practitioners, educators, and researchers. At this stage of development, these multiple perspectives will help us to build a comprehensive, relevant, and useful knowledge base for developing and improving standards.

Game designers will find information about the best practices in game design, the latest technological solutions, and the latest requirements standards for each application domain and purpose. For computer technology developers, the topic area will cover the latest standards in game and simulation technology, together with the latest technology requirements put forward by users, designers, and researchers. For educators, we hope to provide information on what students need to know and what skills they must acquire for successful design and application of games and simulation models. We will show practitioners best practices in the application of games and simulation models, and researchers will find information about the state of the art and developing knowledge.

Defining games, simulations, and game-simulations

Games and simulations is a broad topic with elements covering many disciplines and a range of artifacts. To improve the state of the art, we must understand the elements that constitute the fundamental, standard building blocks of each and every game and simulation. We must also understand how these elements fit together and affect games’ and simulations’ behavior. Furthermore, we need to understand how game play affects human learning and experience.

By focusing on these building blocks, we can accomplish two things. First, we can cover and debate each design and application, establishing effective architectures, design specifications, and user requirements. Second, we can facilitate the evolution of a standard vocabulary for the effective exchange of knowledge and experience.

We can illustrate this principle using a car metaphor. We all know about cars; we see them every day in all kinds of shapes, colors, and types (trucks, fire engines, police cars, ambulances, and so on). To understand how all these cars work, we don’t need to understand every type. We need to understand the elements that constitute a car, and furthermore, how we can adapt each car to its purpose. First, we must understand a car’s building blocks (wheels, engine, frame, body, seats, steering wheel, and gearbox) and how they fit together. Second, we must understand the application domain and the functions that the car needs to fulfill. Together, these knowledge areas enable us to discuss the design and application of cars for any purpose.

Figure 1 shows a graphical definition of gaming and simulation as presented by Richard (Dick) Duke and later expanded upon by Ivo Wenzler and Swen Stoop. It shows that games and simulations are abstracted representations of reality, the level of abstraction depending on the purpose we aim to achieve. The orange circle in the middle shows the game or simulation and its application environment. To the left and right, we see games and simulations’ five most basic building blocks:

- **Content** describes games and simulations in terms of what and whom they represent. Each topic area or domain in which a game or simulation is used could result in additional (dedicated) design and application requirements. Content also includes the scenarios used in the game or simulation.
- **Purpose** describes the game or simulation’s intended goal: entertainment, education, research, training, decision making, planning, socialization, communication, and so on. Again, each “purpose” category could result in additional requirements.
- **Games** are centered on the nature of the interaction between players and between players and the game, usually described in the game rules. This also includes knowledge about interaction mechanisms and their effects.
- **Simulations** provide representations of real-world objects and processes that behave like their real-world counterparts. Games use simulation models to create a dynamic environment (that is, models of objects and processes) in which game play will take place.
Media technology involves the environment in which games and simulation are represented and played. Examples include cardboard, paper, or plastic playing pieces in board games; metal figures and model buildings in tabletop games; and virtual worlds and figures in a computer game. For digital games, media technology includes all kind of digital technologies, such as software programming, video technology, digital animation, and network languages. Our DS Online topic area is about games and simulations in a digital environment. We would also like to focus on distributed online games and simulations.

Figure 1. Games and simulations are abstracted representations of reality composed of five basic building blocks.

Games and simulations increasingly overlap, forming something we identify as game-simulations. In these cases, the boundary between the concepts of “game” and “simulation” is becoming more and more blurred, particularly when it comes to serious application in education, training, research, and innovation. We still use the concepts of game and simulation, however, because they each have very specific capabilities and utilities. Conceptualizing games and simulations as two fundamental building blocks, however, helps us better understand the roles and utility of game-simulations and other instantiations of games and simulations.

We want your feedback and comments on this topic area and its content and format. Its success relies on the development of a community that reads it regularly and contributes to its development. The development of standards for game technology and simulation models depends on practitioners, designers, educators, and researchers communicating and sharing knowledge and experience. So, please send us your feedback at dsonline-games@computer.org.

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Related Links

- Games and Simulation topic area home page
- "From Visual Simulation to Virtual Reality to Games," Computer (http://doi.ieeecomputersociety.org/10.1109/MC.2005.297)
- "Games and Traffic Safety—An Experimental Study in a Game-Based Simulation Environment," Proc. 11th Int'l Conf. Information Visualization (http://doi.ieeecomputersociety.org/10.1109/IV.2007.54)

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