Identity Crisis

If you declare yourself as a simulation researcher, a *simulationist* (which could result in peels of laughter), or as someone who dabbles in the *field* of simulation, you are likely to get one of two responses: *Simulation of What?* or *What is Simulation?* If you practice simulation in a particular area then you may be less likely to have trouble with answering the first question, but for generalists like me, it is a recurring problem. It stems from the fact that simulation is so successful that many people can’t imagine that there is a field called *Simulation*—a discipline of study that separates itself from a particular domain. Maybe part of the issue deals with the name itself. If you tagged on the terms *Methodology* or *Theory*, you may be on safer ground. After all, can you imagine working in the area, *Theory of Computation*, and being asked “What are you computing?”

The second question is even more complex: *What is Simulation?* The response to this could range from “It is the modeling and analysis of systems” to “It is the study of time-dependent systems involving a change of state or event.” I sometimes find it easier to define the area within the context of other, related, areas. This works for students who take classes in these other areas, but it may or may not work in the real world. Let’s give it a go. Most people today know about games and going to the movies, so we can use these familiar frameworks to define simulation. Using one versus the other depends on to whom you are talking. Computer Graphics is about creating artificial geometries and lighting conditions—for example, making the artificial ship in the movie *Titanic* or crafting the tall, walking * Ents* in the *Two Towers.* These things don’t exist in real life, so we need to use the computer to give them form and life.

Computer Simulation is about giving the Titanic and the * Ents*’ behavior or dynamics. How do they move? They move, shake, rattle, and roll according to things we call simulation models. Models in Graphics are for representing geometry and shape, whereas models in Simulation are for representing dynamics and behavior. Computer Vision is the opposite of Computer Graphics in that we are analyzing, not synthesizing, images. However, in today’s games and movies, the two grow closer with techniques such as photogrammetry. We also have areas that deal more with the interface between humans and systems. Virtual Reality and Augmented Reality focus on interfaces. For Virtual Reality, the question may be how to create an immersive technology-park ride that makes
you feel like you are on the Titanic, or sitting on the shoulders of an Ent. With Augmented Reality, you might be sitting in a physical mockup of the Titanic’s dining room, but seeing virtual passengers and staff going to and fro.

This kind of explanation does not always work, as it might complicate life by providing more than the listener really wants to know. But, for people who have heard of at least one of the above areas, it provides a definition through contextual means. And, then, there is always the situation where for some, Simulation is a term that has a very applied or focused meaning. After all, what is simulation?