

Foreword

Since the beginning of the human race people of all ages have built and played with toys. These early toys were reproductions of reality in the form of model animals, human beings, or accessories used by humans. With the progression of time and technology these toys became more complex and resembled a clearer approximation of reality. For instance in the nineteenth century a model of a mansion was built and presented to Queen Victoria of England. The model is currently on display at Windsor Castle near London. It is amazing: there are printed books in the house library with pages at a scale of about 1cm, crockery of a similar size and a fully functional meat grinder. Building models of real objects is now quite a popular worldwide hobby with model shops selling components for constructing planes, cars, and trains.

During the medieval times in Europe a new type of model emerged: objects that helped adults increase their skills. Examples of such devices are full-scale horse models used to train knights for castle tournaments. With emerging technologies these models have become quite complicated. Many of us have tried--more or less successfully--to ride these mechanical horses installed at amusement parks or bars. In the United States, the mechanical bull remains a popular form of simulated riding as well.

Mechanical simulations are not just for amusement. Some models have become indispensable job training components. Perhaps one of the best examples were the *Link Trainers*, also known as the “Blue boxes” or “Pilot Trainers.” This series of flight simulators was produced between the early 1930s and early 1950s by Edwin Albert Link, based on technology he pioneered in 1929 at his family’s business

Figure 1. Link Trainer (from Wikipedia)



Figure 2. Pong Screen (from Wikipedia)



in Binghamton, New York. The simulators were a critical training tool that became famous during World War II, when they were used as a required pilot training aid by almost every combatant nation (Wikipedia, 2010).

The *Link Trainer* was an electro-mechanical device far advanced for its time. However, for a fully electronic model created through the use of digital electronic circuits we needed to wait for over 20 years. In the early 1970s ping pong simulator machines appeared on the market. These were a two-dimensional sports game where competing players controlled in-game paddles by moving their paddle vertically across the side of the screen. Players used the paddles to hit a ball back and forth with the game tracking the score on the top of the screen. The most famous of these games was *Pong*.

When these games appeared in the home, the electronics of the game were attached via a console to an ordinary TV set and paddle movements were controlled by potentiometers on the console or via wires connected to the console (Winter, 2010).

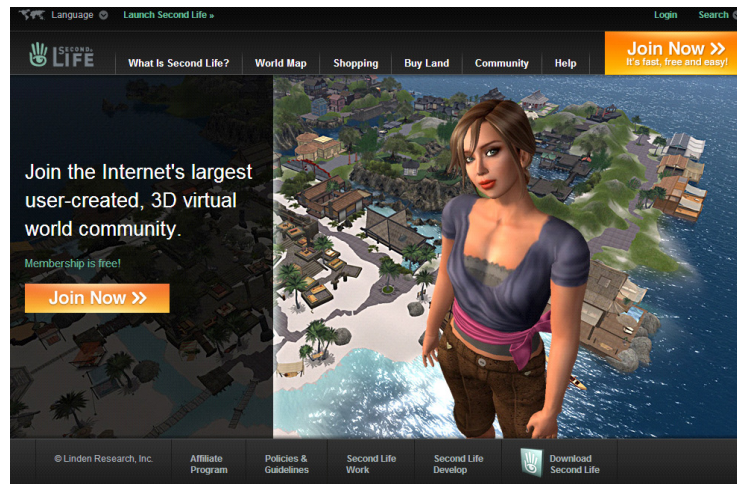
In the 1980s the introduction of PCs led to the development of electronic games. Initially these games were not much more complicated than *Pong*, but there were first attempts to design a flight simulator (Gruppig, 2001). In the mid 1980s *Lunar Lander* allowed an operator to simulate man's landing on the surface of the Moon (Bousiges, 2008). The operator could see a simplified instrument panel of a moon-lander and a rudimentary view of the Moon surface on the screen. After a successful landing the screen would show a panorama of the Moon, with the landing craft and a sketchy figure of an astronaut descending the ladder and planting a flag on the Moon's surface.

But raster graphics and line drawings were only the beginning of simulated environments. Lunar landscapes of the past gave way to realistic worlds. As computer graphics, memory, and processing speeds increase, the quality electronic worlds are on a visible permanent and rapid increase. Whether it's the realism of alien worlds that only exist in the developers' minds, or the combat interaction that can sometimes be too realistic, contemporary virtual worlds and environments become alternate realities for many. These games allow the operator to act within a virtual world almost in the same manner as a real person would behave in the physical realm.

This trend has culminated in the emergence of multiple virtual worlds, existing only within the digital realm. *Second Life* is perhaps the most world-wide known application of this type. *Second Life* operators can create people, homes, workplaces, houses, and other objects, as well as interact with the environment and other virtual inhabitants.

These newfound worlds bring about an important challenge: by using their computers to create or to participate in the development of objects in the electronic world, users expose their own system to

Figure 3. Introductory screen of the “Second Life” system



possible attacks launched via these applications or other virtual world inhabitants. Also, by creating objects in that world, they may involuntary embed their own or their workplace’s personal information or proprietary data and expose it to attacks and theft because standard security policies and procedures may not readily be applicable in virtual realms.

As a result there is growing interest in the review of privacy issues and security problems related to these new 3D electronic worlds. In this book the authors discuss the uses and potential of virtual technologies and examine secure policy formation and practices that can be applied specifically to each. Moreover, in this book you will find examples of the challenges and successes of organizations and individuals within these virtual offerings. Authors present guidelines, techniques, cases, and methods that explore security in Virtual Worlds, 3D Webs, and Immersive Environments.

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