Chapter 1.31
The Game of Defense and Security

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To stimulate creativity, one must develop the childlike inclination for play ...
Albert Einstein

ABSTRACT

This chapter covers the emerging area of the use of commercial off-the-shelf (COTS) computer games for military, defense and security purposes. A brief background is provided of the historic link between games and military simulation, together with the size and scope of the modern computer game industry. Considerable effort is dedicated to providing a representative sample of the various defense and security usages of COTS games. Examples of current usage are drawn from a range of nations including the United States (U.S.), Australia, Denmark, Singapore and Canada. Coverage is broken into the three chief application areas of training, experimentation and decision-support, with mention of other areas such as recruitment and education. The chapter highlights the benefits and risks of the use of COTS games for defense and security purposes, including cost, acceptance, immersion, fidelity, multi-player, accessibility and rapid technological advance. The chapter concludes with a discussion of challenges and key enablers to be achieved if COTS games are to obtain their true potential as tools for defense and security training, experimentation and decision-support. Aspects highlighted include the dichotomy between games for entertainment and "serious" applications; verification, validation and accreditation; collaboration between the games industry and defense; modifiability, interoperability; quantifying training transfer; and a range of technological challenges for the games themselves.

INTRODUCTION

Games and warfare have a long association—venerable and even ancient games, including Go (called Wei Chi in China), chess (really a family of related games including European, Chinese—Xiang Chi, Japanese—Shogi, Korean—Changgi, Thai—Makruk, Burmese—Sit-

tuyin and the Indian forerunner Shatranj) and Owari (from Africa—also spelled Awale and Warri), are abstract models of military conflict. Many have been used for teaching some of the principles of warfare, while others, such as the game of Kriegsspiel[1], were created and utilized directly as a military teaching tool.

The computer game as a genre is just more than 40 years old. Perhaps not surprisingly, the first known game—Spacewars—was of battle, between two spaceships (BBC, 2001). In the 40 years since Spacewars, computer games have gone from 2K (byte) programs written by enthusiasts to immersive, multi-media products developed by large teams and which support an international industry with a revenue estimated to be in excess of $15 billion per year. A typical modern game provides a swath of features—immersive 3D and multi-media content (audio, video, story); increasing degrees of interactivity with a simulated world; an intuitive and well-designed user interface; sophisticated "artificial intelligence (AI)" (computer-controlled) opponents and allies; multi-player capabilities in collaborative and opposed scenarios; and scenario building and editing capabilities (some even provide their own programming language or Application Programming Interface, or API[2]).

If the abstracted board games of the past have offered utility as tools to the military; then what potential exists in the sophisticated COTS games of today for modern defense and security applications? Clearly, promise exists across a range of applications, from training (e.g., soldiers acquiring infantry minor tactics by playing assault and defense scenarios as part of a section or platoon) through decision support (e.g., testing a possible course of action by creating it and then playing it out in-game), experimentation (e.g., modeling and testing a new capability within a game) and others (e.g., teaching history or lesson-learnt through game scenarios that recreate actual events).

As shown subsequently in this chapter, there is a groundswell in the military application of COTS game technology. However, with a few exceptions—such as the work of the MOVES Institute[3], the Institute for Creative Technologies (ICT) [4] or Virtual Environments & Simulation Laboratory (VESL) [5]—there has been little in the way of a systematic or scientific approach to the issues in utilizing COTS games for military and defense applications. At the crux of the matter lies a dichotomy between the original purpose of the game—an entertainment product—and its defense or security application—a simulation of some aspect of defense or security. From that difference, a number of technical and organizational issues arise, ranging from verification and validation (in effect, ensuring the models the game employs match the real world) through acceptance by senior officers and decision makers, to data-capture, modifiability and life-cycle support. A number of open research and technical challenges remain in this area; the solutions of which will greatly increase the breadth of application and depth of benefit to defense organizations through the utilization of COTS game technology.

This chapter seeks to provide a brief background on the game industry and technology of a modern game; illustrate areas in which game technologies are already being used or explored as a defense or security tool; point out the possible applications in the military and security spheres to which games could be applied; and to illustrate the key research and practical challenges that must be overcome for that potential to be realized.

THE COTS GAME INDUSTRY IN BRIEF

The entertainment software (computer and console games) market is large. Sales in the U.S. topped $7 billion in 2003, more than double that of 1995 (Entertainment Software Association, 2004). Figure 1 shows the rise in U.S. sales in the last decade.