FLASH-BASED MEDICAL DEVICE SIMULATION

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Introduction

Health-care providers, from multiple fields and with varying degrees of experience, are required to use increasingly complex medical devices (such as cardiac monitors, ventilators, and IV pumps) in their practice. In some instances (cardiac defibrillation, for example), immediate and proper use of these devices is essential for patient survival. In this abstract, we describe the development of internet-based equipment simulators that can be used for training, review, and competency testing.

Abstract

High-fidelity simulation scenarios are increasingly popular in medical education. In addition to exposing users to simulated patients, these scenarios provide exposure to and training with various medical devices, prior to having use these devices "real-time". While an attractive methodology, this approach is resource-intensive and is only available at dedicated training centers.

The use of internet-based equipment simulation would provide health-care providers with a chance to familiarize themselves with complicated devices at a time and location of their choosing. To this end, we have developed a high-fidelity simulator of a cardiac monitor-defibrillator[1] using Macromedia Flash[2] software. The advantages of using Flash technology are numerous; programming is relatively simple, bandwidth requirements for Internet delivery are low (even for dial-up connections), user-interaction is inherent in the design, and the Flash player is nearly ubiquitous amongst computer users[3]. Furthermore, advanced designs and implementations are possible, using the statechart method as described by Kaye and Castillo[4].

We envision this technology will be applicable to numerous devices, and can be used as a resource for initial training, point-of-care review, and in testing environments.

1. Thomsen, TW. Lifepak 12 Flash Simulator. 2003, available at http://www.mah-em.org/sol_05/lifepak.swf.

2. http://www.macromedia.com/software/flash/.

3. NPD Online survey, conducted September 2004. Available at http://www.macromedia.com/software/player_census/flashplayer/.

4. Kaye J, Castillo D. Flash MX for interactive simulation. New York: Thomson - Delmar Learning; 2003.