Chapter 34
Challenges in Game Design

Anna Ursyn
University of Northern Colorado, USA

ABSTRACT

Electronic games and gaming can serve as the tools for visual solutions. It depends on the methods through which the games are delivered and the ways people think about electronic games. First, traditional and electronic gaming is described, and then, various goal-oriented game applications are discussed. Game features acting in favor of or against gaming complete this part of the book.

INTRODUCTION

The advent of electronic games in the early seventies brought about transformation of the methods the games are delivered and the ways people think about games. Electronic games are often created as art forms; they serve several quite different goals such as

- Teaching tool for education and training
- Entertainment
- Health, and fitness, many times including biofeedback
- Simulation games that serve for knowledge acquisition in medical diagnosis, business strategy, or business management. Research and evaluation have been intensively conducted on strategic management simulation games
- A way of networking.

With new technologies in gaming such as Nintendo Wii U (http://www.nintendo.com/wiiu), PlayStation PSVita (http://us.playstation.com/psvita/), and possibly X Box 720, gamers can play with opponents from all around the globe without knowing if they play with somebody's grandma or a second-grader escaping his classroom experience. However, current trend is to allow the gamers scan their face, the back of their head, and the whole body, along with their favorite object, to become their own avatar, rather then playing their avatar. Moreover, instead of looking at iconic images or characters moving across the screens, they'd see the faces of their opponents and communicate with them in real time. According to some, just like with a Skype-based communication, it will be a syncretic experience, because they can see, hear, and watch the body language of their opponents.

Rationale for educational gaming includes the enhancement of student motivation and active

engagement, along with behavioral approaches to learning such as: situated experiential learning; distributed (spaced) learning that includes review of the material separated from instruction by a period of time (Litman & Davachi, 2008); a blended learning approach that combines face-to-face facilitation with computer-mediated instruction; learning with the use of texting; and discovery learning. Playing games involves learning social skills, collective problem solving, and social negotiation. In order to support research and evaluation of educational games Wideman et al. (2007) developed research software that records screen activity during game play in a classroom setting along with synchronized audio of player discussion.

Game environment and equipment have been also changing. Tangible equipment to play a game may no longer be necessary, such as a deck of cards, markers for board games, croquet balls, or a Frisbee disk. One may say electronic games are becoming the main source of entertainment, at least in terms of time assigned by users. First of all, computing for entertainment became one of activities done on the phone and on tablets with the use of countless applications (for instance, one may find hundreds of game applications on iPhone and tens of games on iPad). One cannot debate computer games without talking about phones and applications. Moreover, there is a multitude of tools, many of them being available open source, providing self-explanatory directions and visual feedback. Games are easy to learn, often short, and transferable on different screens; they can be played with friends through Skype or on Nintendo Wii with invisible coded characters. With current developments in a scanning technique one would play not only by using avatars but also by becoming one's own avatar, after one's face, back, and a favorite object would be scanned and imported to the console. Moreover, several augmented reality (AR) are designed for the Nintendo 3DS and 3DS XL consoles with paper cards that interact with the games. By scanning the QR (quick response) codes shown on cards, real time graphics are augmented onto live footage (http://en.wikipedia.org/wiki/Nintendo_3DS).

Creating new projects including games is supported by many open source platforms capable of interacting with users through interfaces, for example Arduino. Processing, an open source programming language is one of such tools addressed to non-programmers who are willing to learn programming. Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments. Arduino can sense the environment by receiving input from a variety of sensors and can affect its surroundings by controlling lights, motors, and other actuators. The microcontroller on the board is programmed using the Arduino programming language (based on Wiring – an open-source programming framework for microcontrollers) and the Arduino development environment (based on Processing). Arduino projects can be stand-alone or they can communicate with software on running on a computer, e.g. Flash, Processing, MaxMSP (Arduino, 2012). For example, Arduino board is a part of the user interface designed for peripheral regulation of respiration (Moraveji et al., 2011).

TROUBLES WITH DEFINING A "GAME" CONCEPT

In his work "Homo Ludens" Johan Huizinga (1938) provided a definition for play,

[Play] is an activity which proceeds within certain limits of time and space, in a visible order, according to rules freely accepted, and outside the sphere of necessity or material utility. The play-mood is one of rapture and enthusiasm, and is sacred or festive in accordance with the occasion. A feeling of exaltation and tension accompanies the action, mirth and relaxation follow (Huizinga, 1968, p. 132).

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