Game Emulation: Testing Famicom Emulation

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Emulation

Emulation is one of three strategies commonly discussed in the videogame preservation literature (Feeney 1999. See also Lowood et al. 2009; Swalwell 2009; Guttenbrunner et al. 2010; Barwick et al. 2011). Other strategies include preserving the original technology (consoles and cartridges) and migrating games to new platforms. A related strategy of preserving secondary materials from recordings of gameplay to game design documents is also important, but doesn't actually preserve the game so it can be played. All four strategies are important and institutions around the world including Stanford University, the British Library, the Berlin Computerspielemuseum and the Smithsonian have been exploring them. Emulation offers the greatest promise as it is less expensive than completely reprogramming games on the one hand, and more likely to provide long term preservation than preserving hardware that was never designed to survive over the long term (for a critical discussion about the need of emulation in game preservation, see Newman 2012).

There are, however, problems with emulation. The first is that emulation is illegal under most circumstances. As a Nintendo official web page on "Legal Information (Copyrights, Emulators, ROMs, etc.)" puts it, "The introduction of emulators created to play illegally copied Nintendo software represents the greatest threat to date to the intellectual property rights of video game developers."[1] The second problem is that emulators themselves need to be maintained. It is no use developing an emulator to preserve games if the emulator itself can't be preserved.

Testing Protocol and Preliminary Results

Important to emulation is testing the fidelity of emulators. For this project we developed a protocol for testing emulators by playing the same games on the emulator and a control system (original or other emulator.) The gameplay was videotaped and then merged so that we could watch the same game on the emulator and control on the same screen. These were then studied to see what differences there are, if any. We are happy to report that there isn't much of a difference between the Nintendo Emulator and the original machine (NES). The graphics, sounds, movement of objects on the screen, and speed of play were almost exactly the same. The players when interviewed also reported that they couldn't tell the difference. In a second test we compared the Emulator to the Wii Virtual Console versions of the same games. In this experiment, we used a CRT monitor for the Emulator as that is what players at the time would have had, but the Wii was designed for LCD monitors. Comparing the Emulator with a CRT monitor to the Wii Virtual Console we found that the Wii's screen's color brightness is darker than the Emulator. Further, because the Wii controller is different from that of the NES, the physical experience of the player holding a controller is different.

[1] <http://www.nintendo.com/corp/legal.jsp> Retrieved Feb. 13, 2013.

The Nintendo Famicom Emulator

The RCGS has dealt with the legal issues through an innovative collaboration with Nintendo. In the presentation we will demonstrate this emulator that has to be plugged to the original Nintendo Entertainment System (NES) to be run. The original NES provides the authentic game controllers for the emulator.

References

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