

Project Title: “An Intuitive Video-Game System”

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One of the most discussed topics in the video-game industry is the notion of player agency, defined as “the feeling of empowerment that comes from being able to take actions in the [game] world whose effects relate to the player’s intention” (Mateas and Stern 649). If a player presses a button and Mario jumps, this player is experiencing some agency. However, if the player’s feet actually had to leave the floor for Mario to jump, the player’s agency would greatly increase. Improved agency typically leads to more interesting and entertaining game play.

Although button-pressing on a directional pad (“D-pad”) has become the game industry input standard for general movement commands, we hypothesize that replacing a D-pad with actual spatial movements should increase player agency and, therefore, the game’s entertainment value. Please note that in this project, we only want to replace the D-pad; we will still utilize action buttons on the controller.

We will create two controllers, each containing three buttons for controlling three different-colored LEDs. There is a directional LED and also an LED for each of the two action buttons. We will use one camera to keep track of two players’ actions, and the game screen will be split vertically into two frames, with each frame observing the velocity of a controller’s (active) LEDs. Our project will process all of this information and output a sequence of commands, including: the four cardinal directions and the two action buttons from the controller, as well as a reset command from the FPGA. The signals for the directional instructions will pulse at different rates depending on the velocity at which the controller is moving, while the action button signals will remain high for as long as their respective buttons are pressed.

We will be creating a game to test our controller’s functionality. Our game is abstracted from the interface, effectively creating a console / game modularity common in video-gaming. Our design should closely resemble Atari’s “Super Breakout” (1978), with a few modifications to accommodate our controller’s six-button input capability. The game’s complexity (or number of games) could potentially increase, provided we have additional time at the end of the semester.

Work Cited

Mateas, Michael and Andrew Stern. "Interaction and Narrative." The Game Design Reader: A Rules of Play Anthology. Ed. Katie Salen and Eric Zimmerman. Pages 642-669. Cambridge: MIT Press, 2006.