Electronic Memory Game

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Introductory

Since the mid 1970’s, game makers have taken the children’s game Simon Says into the electronic era in various forms. The first attempt was a memory matching arcade game in 1974. The player had to match tones to buttons that lit in a particular sequence. The arcade game was unsuccessful because the tones were harsh and all of the buttons were the same color. A different company eventually improved on the design three years later. This unit was portable, with pleasing tones and four separate colors. The new memory game became an instant success and it is still popular almost thirty years later. For my senior project, I propose to recreate the electronic version of the memory game.

Description

My version of the game will be able to be played by one or two people. It would include the standard unit that lights up, but instead of using the lights as buttons, each player will have a controller to enter the appropriate sequence. Players will continue to face each other until one reaches three incorrect sequence inputs. A LED display will keep track of scoring. Each of the four colors that will light up around the unit will also use LEDs. Each color will have two LEDs as an output. These will be placed under an opaque surface, such as wax paper, for easy viewing.

In the center of the unit, two sets of three LEDs will be used to keep track of each player’s missed input. Two controllers will transmit player input to the MCU. These controllers will each have four buttons that will correspond to the different colors. Additional features that could be incorporated in the future would be a difficulty level adjust, a single player score and a battery pack to make it portable. The single player score would basically tell the player how many times they successfully entered the sequence if they did not finish. The difficulty level and the single player score would incorporate either the use of a seven-segment display or a LCD screen. This would provide the player with a clear visual during the game.

Block Diagram
Benefits

The benefit of this project is that it is a game that one or two people could enjoy. It is a game that helps with the memorization of patterns and develops hand-eye coordination. The use of LEDs means less power consumption and no bulbs to burn out. Also, the use of controllers prevents the players from hitting the unit itself, protecting it from shock.

Comparison of Competing or Similar Products

Most versions of the electronic memory game are single player. Those that do contain multiplayer functionality need to be bigger so that each player has four colors on the unit. This makes these games larger in physical size. Another drawback to these games is the fact that each player has the possibility of hitting their opponent’s buttons. By using controllers, I can maintain a smaller game size and prevent players from cheating.

In other units, the single player game can be varied through the use of difficulty levels. Each level has a predetermined number of colors it can have in its sequence. The levels also are varied by speed. In my version, I plan to remove the difficulty setting and instead have only one predetermined number of colors. The sequence will change with each new game and as the player inputs more colors correctly, the sequence will speed up.

How the Project will be Developed and Demonstrated

The project will be developed in the lab. I have applied for samples of materials I need online. However, the buttons, wire and LEDs can also be purchased online or at local stores such as Radioshack. Tools for debugging and testing will come from Western’s engineering building, room 340. All components, except for the controllers, will be encased in a small container. The LEDs will emit from the top of the container and the controllers will come from opposing sides. The project will also be powered from a wall outlet or test bench.

The electronic memory game will be demonstrated at the end of spring quarter in 2007. It will be ready for single player, or multiplayer matches. A paper board will have a picture of the unit, a description of the unit’s layout and what the player can do with the game.