Dodging Box Game Controller

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Introduction and Background

In this project we have developed a game controller for dodging balls. The game is called Dodging Box Controller, the reason for this is the usage of the services arduino and processing to give players the ability to control the box with sensors their score will be showed automatically when box crashed. The box movement is based on the variation in light intensity which is utilized to interact with the dodging box game. This setup was built using an arduino device board with light sensor or better known here as light sensor. Dodging Box is a slightly modified version of the original game and was developed to fully support our game.

Working and Problem

Dodging Box is a slide scrolling game which is developed in processing. The aim of the game is to direct flying box, which flies continuously to the right, between each oncoming set of balls without colliding with them, which otherwise ends the game. The box briefly flaps upward each time the player control the sensor. If the sensor is not controlled, the box falls or crashed with red balls due to gravity and full exposure of the sensor to light. The player is scored on the number of green balls the box successfully got with awarded for the score.

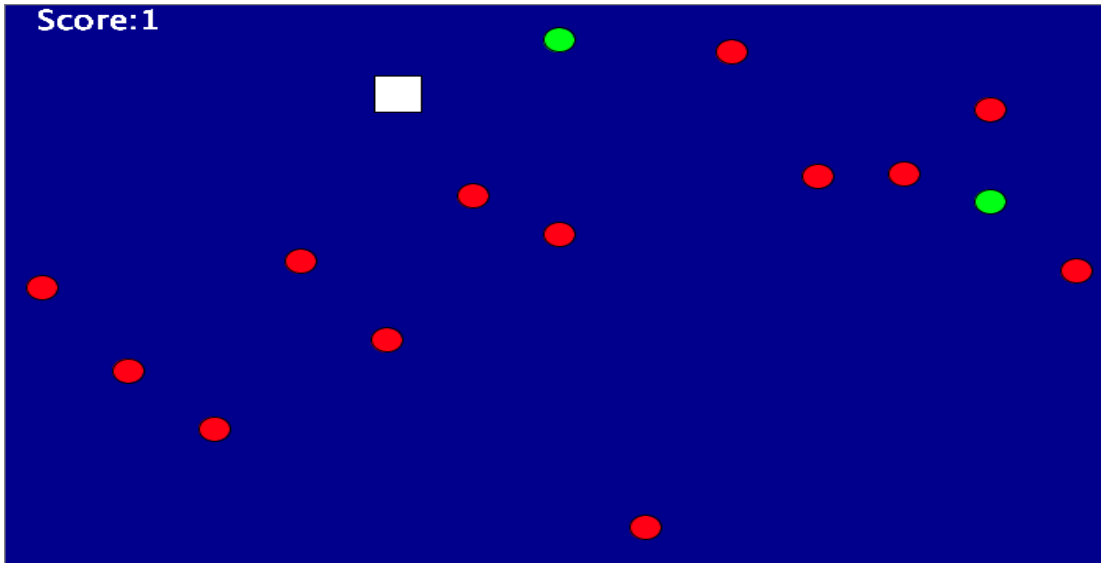

Figure 1: Dodging Box with Red and Green balls

For the game our group used an arduino, one light sensor, 4 10k ohm resistors, various lengths of wire, and 2 breadboards which could be assembled onto a single larger breadboard, the one light sensor is powered by the 5 volt pin on the arduino and is placed on the circuit board. The flying box is controlled by dodging sensor .When the dodging sensor receive low light intensity the box moves to upward direction and in order to move the box in downward direction dodging sensor needs relatively higher light intensity. The light sensor is connected to arduino with circuit. In this circuit we connected light sensor first pin X1 through power red wire with 5V pin on arduino board for passing to the current in light sensor. X2 10K OHM resister is connected with GND2 pin. The second input X pin for output of sensor is connected with AD0 pin and X1 10K OHM resister second pin also connected with AD0 pin. X output wire for sensor output which is input for light sensor. Light sensor reads values from pin AD0 values and send it to arduino. This circuit is explain below in figure 2 and figure 3.

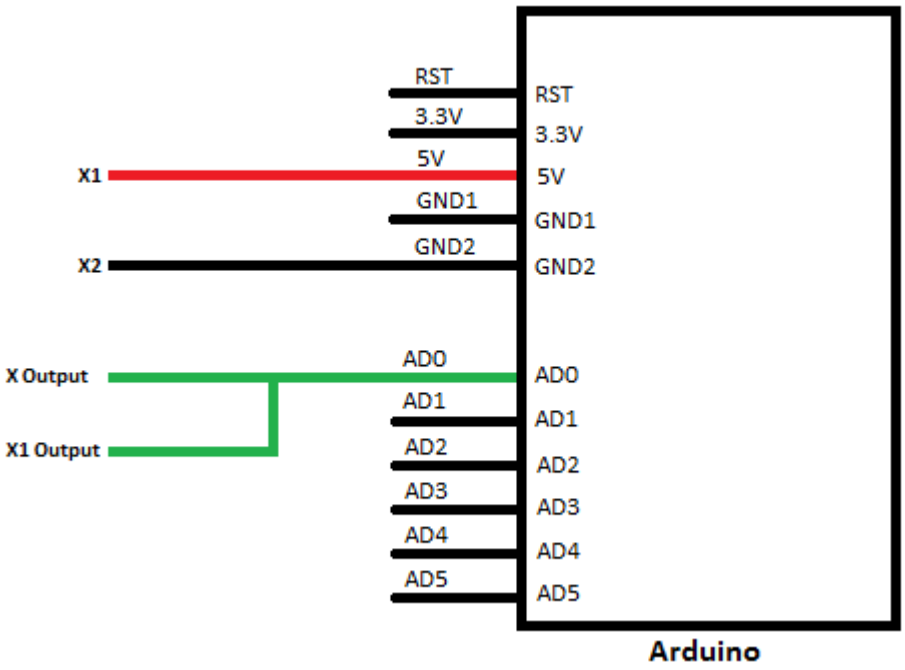

Figure 2: Design Circuit for Light Sensor to connect with Arduino

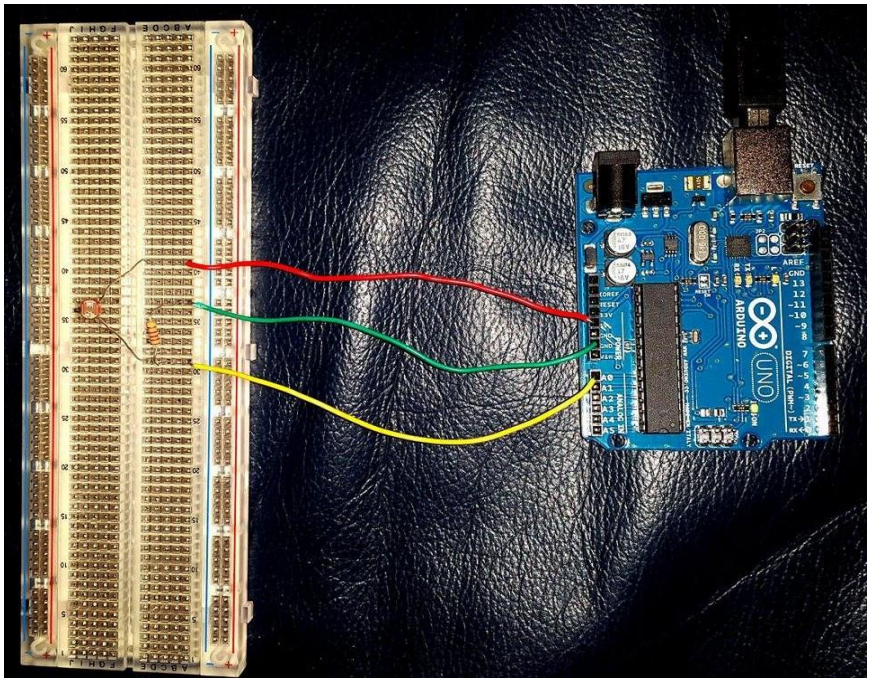

Figure 3: working of Light Sensor circuit and Arduino

Solution

We started with a minimal version of the Dodging box game which was coded in Processing so that we could mainly focus on the hardware part. First we made connections between light sensor and arduino then we made connection between arduino and processing. Before using the processing we tried to connect it to the analog ports and read from them using the analog read function provided by the arduino language. The device was calibrated by a trial and error method where we experimented the sensor by exposing it to high and low light conditions and different angles to find the values that determines how much light is needed to the sensor to be able to control the game effectively. For connecting sensor to arduino we used a solution that was provided to us by the course responsible, this solution was modified and build upon with the processing so that it can read the sensor values and send them to processing.

Future Work

In the future we may consider making the dodging box a more general all-purpose gaming controller that lets the player use simple hand gestures and movements when playing computer games. Another addition to this is to enhance the game with some more different sensors that supports more than two axes for more advanced movements.

References

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2: http://playground.arduino.cc/Learning/PhotoResistor

3: http://www.instructables.com/id/Photo-resistor-controlled-arduino-pong-with-proces/

4: https://processing.org/