Arab Academy for science, technology and maritime transport
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PROJECT Detailed Report

[Arcade Machine]

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1. Summary

The project is an Arcade game machine that uses a microprocessor that contains an emulator of multiple games in it with a high resolution monitor and a high quality sound.

Entertainment is the purpose of this project and to bring back arcade game legacy with a total anticipated budget of 8, 659 EGP.

2. Introduction

Arcade game is an amusement machine that was designed to play one game, it was used to be famous in the 1970s, and its popularity started fading out since the manufacture of video game consoles. We designed a multi retro console game as Atari or Nintendo Entertainment System for two players with a high resolution monitor and synchronized exciting sounds and flashy lights using RGB strips and sound controller system in a single arcade using an emulator called “Recall Box” on a raspberry pi which is connected to:

A LCD controller which is connected to an LCD monitor, the controller receives the signals from Raspberry Pi and send it to the display monitor, The LCD monitor is also connected to a power controller, a sound controller which is connected to the speakers, 2 Arduino encoders for both players that is connect to the switches of the push buttons and the joysticks.

Our main purpose in this project is to entertain and to bring back the legacy that is left behind during the golden age of gaming for the 90s kids.

All of this components included in a CNC arcade body with the RGB strips mounted on it.

Although a lot of high powered game consoles have been developed these days, the arcade games still have its unique taste of gaming that people still design arcade game till today.

3. Needs/Problems

- Needs:
  - CNC Machine to cut the arcade design.
  - A lab for the building for the project.
  - Getting needed components.
- Problems that may be faced:
  1. Not being able to find the compatible components in Egypt.
  2. Getting a suitable CNC design for the arcade.
- Solutions of the problems:
  1. Trying to find a replacement for the selected components.
  2. We modified the most suitable design to meet our needs.

4. Goals/Objectives

- Goals:
  1. Entertainment and enjoyment for 90s kids
  2. Bringing back gaming legacy.
- Benefits:
  1. Designing a multi-game console for arcade machine.
  2. Designing a high resolution and high quality sound arcade game.

5. Procedures/Scope of Work

First, assemble CNC body.

Second, mounting hardware connections:

_Connect the joysticks and push buttons to switches then to the 2 Arduinos for both players.
_Connect the speakers to the sound controller.
_Connect LCD monitor to LCD controller and power board.

_Connecting all components (Arduino, sound controller, LCD controller) to Raspberry pi.

Third, checking and testing connections, and synchronized sounds

Fourth, set up raspberry pi emulator, converting Arduino board to USB encoder, installing some needed libraries, and configuring the game controllers.

Fifth, paint the CNC body with black color, and mount the posters on the body.

Sixth, connecting RGB strip to 12V adapter and mount it on the arcade, and check whether the lights are synchronized with the game sounds or not.

6. Timetable

	Description of Work	Start and End Dates
Phase One	Get components and the CNC body	5/1/2022 To 14/1/2022
Phase Two	Software installations and mounting hardware connections	14/1/2022 To 26/1/2022
Phase Three	Testing and mounting posters	26/1/2022 To 2/2/2022

Budget

Description of components	Price
2 x Arduino UNO	250 EGP
1 x Raspberry Pi 2 GB RAM	2500 EGP
1 x LCD 19 INCH	2500 EGP
1 x LCD Controller Board	200 EGP
1 x LCD Power Board	
2 x Joysticks	480 EGP
10 x Push Buttons	300 EGP
18 x Micro Switches	100 EGP
1 x RGB Controller	500 EGP
1 x RGB Strip	175 EGP
1 x CNC Arcade Body	1500 EGP
9 x Posters	100 EGP
2 x Speakers	50 EGP
Rabin Cables	2 0 E G P
1 x Sound Controller	
1 x Adapter 12V	2 0 E G P

Total	**8,695 EGP**

7. Next Steps

- Make it a portable Arcade.
- Decode both player signals on single encoder.
- Mount a payment method (coin acceptor).
- Implement mobile casting in addition with joysticks.

8. Appendix

- Websites
  https://github.com/AlanChatham/UnoJoy

- Other relevant information or correspondence:
  Body: https://grabcad.com
  Emulator: https://www.recalbox.com

9. Problems Faced Us During The Project.

-We took false measurements of the CNC body of the monitor, joysticks, and push buttons, and we had to resize it manually.
-We couldn't find an arcade encoder for push buttons and joysticks of the two players, so we had to use and Arduino as an encoder instead.
-We used a used joystick from an old arcade, and we faced problems when we reassembled it.
-We used an incompatible sound controller with the speakers.
-We used jumpers to connect to pins of Arduino that was weakly connected, so we soldered the wires to an extended headers.