NESpi

**Project Proposal**

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Description

The Portaberry Pi is a powered portable emulation machine created by either building the Binaries by compiling Source Code or using a prepared gaming SD Card Image. This project will made using the former in order to have more power and decide the advantages and disadvantages of the emulator. Such things as performance, accuracy, ROM/Image compatibility, or ease of use all need to be balanced. Emulators can be designed for many systems and the original purpose of this project was to develop for the Nintendo GameCube, but unfortunately the Raspberry Pi simply does not have enough power to run such a system. Therefore, a less potent system will be emulated instead; the Nintendo Entertainment System.

Milestones

* Installing/Compiling the emulator successfully
* Running a ROM successfully on the device
* Creating a Main Menu User Interface in between startup of the Pi and Emulator
* Adding the capability to manage (download, install, delete) ROMs from the Main Menu
* Completing the circuitry for user input (buttons)
  + D-PAD UP
  + D-PAD LEFT
  + D-PAD DOWN
  + D-PAD RIGHT
  + SELECT
  + START
  + B
  + A
* Completing the physical handheld console’s case

Deliverables

* Showing an NES ROM running off of the Raspberry Pi
* Custom controller capable of playing through a game
* The completed (fully functional) dashboard/user-interface
* Finished product

Activities Breakdown

* Research and order necessary parts for hardware development – 3 hours
* 3D design case – 3 hours
* Flash Raspbian to an SD Card for use with the Raspberry Pi – 1 hour
* Follow the installation instructions to install and run the emulator on the [GitHub](https://github.com/libretro/nestopia/blob/master/README.unix) page – 3 hours
* Run the emulator using a NES ROM – 1 hour
* Research methods for creating the dashboard UI – 3 hours
* Design the UI – 2 hours
* Code the dashboard menu – 3 hours
* Enable starting the emulator from the dashboard with a ROM – 3 hours
* Implement ROM management from the dashboard (USB & WiFi) – 5 hours
* Enable speakers – 1 hour
* Add hardware controller functionality – 3 hours
* Attach LCD display – 1 hour
* Insert battery – 1 hour
* 3D model and print case – XX hours; no 3D modeling experience
* Assemble NESpi – 2 hours

Audience

The targeted audience and users includes those who enjoy reminiscing by playing their favorite Nintendo Entertainment System games but would like the freedom that mobile devices give and the customization offered by Linux operating systems.

Currently existing works & New features

Projects that currently exist that hold the same or similar features include:

[Portaberry Pi (Handheld Raspberry Pi Emulator)](http://www.thingiverse.com/thing:321624)

[Raspberry Pi Portable](http://www.thingiverse.com/thing:110354)

[RetroPie](https://github.com/RetroPie/RetroPie-Setup)

[RetroPie/Nintendo Entertainment System](https://github.com/RetroPie/RetroPie-Setup/wiki/Nintendo-Entertainment-System)

[libretro/nestopia](https://github.com/libretro/nestopia)

The Portaberry Pi and Raspberry Pi Portable will stand as a guide as to how to build the hardware for the system. For ease, a direct copy of the 3D model files from the Portaberry Pi project’s case may be used. The physical model is rather large, however, and is not in favor. The RetroPie is an excellent example of emulating Nintendo systems on the Pi and was used by both the Portaberry Pi and Raspberry Pi Portable projects. RetroPie has a large Wiki on GitHub dedicated to providing information on how to install the different emulators. Nestopia is the name of the emulator that will be used to run the NES.

The main purpose of the project is to create a customized version of the portable NES in terms of physicality and the user interface. Since this project has been completed before, it is difficult to find room for differentiation from others. However, this model will contain an opening screen much like the modern Nintendo3DS and allow the user to manage their ROMs from a dashboard and even have the capability of downloading new ROMs from over the web using a wireless adapter.