

EE 357 Project Proposal - Nunchuk Space Invaders

Johnny Jung & Sheldon Kwok

Introduction: For this project, we will implement a Wii Nunchuk-controlled Space Invader-style shoot-em-up game with the MCF52259 board. This will essentially be a two-dimensional shooter where the Nunchuk will control a space ship that can shoot lasers at incoming aliens coming from the top of an LCD screen. The objective of the game is to survive and kill incoming waves of these aliens on the screen. We think that the Wii Nunchuk will enhance this game tremendously as this will allow players to move around in this 2D space (with the joystick), shoot weapons (with the buttons), and perform certain movements with usage of the accelerometer in the Nunchuk.

Motivation: Our motivation for this project comes from our interest in Human-Computer Interaction and how to create applications and projects that are increasingly more natural for human usage. Initially, we have intended to use the Wiimote[1] itself as an input device for our Space Invaders game, but the technical aspects of this would most likely be overwhelming for this project in itself. Instead, we have decided to use the Wiimote Nunchuk peripheral, as it is compliant with the I2C bus standard and it still offers some of the HCI potential as the Wiimote itself.

Nunchuk / I2C: We will communicate between the Nunchuk and the MCF52259 board using the I2C bus protocol. Looking at the Microcontroller Reference Manual (specifically Ch. 29), it seems that I2C is definitely a feature on the MCF52259 board. In order to make this connection work though, several online resources will be used to help us on this project. Extensive work has been done already, but most (if not all) work has been geared towards the Arduino[2][3][4]. We will modify this work to the MCF2259 board. Additionally, we believe that there is enough technical information to help us out with this project, even ranging from the data format of the Nunchuk input and how to set up the I2C protocol[5][6][7][8][9][10].

Component List:

- Wii Nunchuk Peripheral
- Wii Chuck Adapter[11][12] - <https://www.sparkfun.com/products/9281>
- LCD Screen

Initial Prototype: For this project, we will aim to create a working version of Space Invaders that leverages all the capabilities of the Wii Nunchuk and outputs the game onto a LCD screen. This will most likely be one never-ending level with a high score component, but will be fully functional with the Wii Nunchuk (i.e. can shoot aliens down, can do barrel rolls, etc.).

[1] <http://johnnylee.net/projects/wii/>

[2] <http://www.windmeadow.com/node/42>

[3] <http://lets makerobots.com/node/5684>

[4] <http://todbot.com/blog/2007/11/24/bionic-arduino-class-notes-3-4/>

[5] http://wiibrew.org/wiki/Wiimote/Extension_Controllers

[6] http://wiibrew.org/wiki/Wiimote/Extension_Controllers/Nunchuk

[7] <http://www.britishideas.com/2011/08/20/reading-a-wii-nunchuk-using-i2c/>

[8] <http://forum.allaboutcircuits.com/showthread.php?t=34422>

[9] <http://www.nerdkits.com/forum/thread/972/>

[10] <http://dangerousprototypes.com/2009/08/19/bus-pirate-wii-nunchuk-quick-guide/>

[11] <https://www.sparkfun.com/products/9281>

[12] <http://todbot.com/blog/2008/02/18/wiichuck-wii-nunchuk-adapter-available/>