
Wiimote Hackery Studio Proposal

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Abstract

Through reuse, reinvention and modification of materials, people easily prototype tangible interactive systems and redesign their everyday environments. Off-the shelf devices, such as the Nintendo Wii remote, provide one entrance into this world of hackable parts and Do-it-Yourself (DIY) activity. The Wii remote and extension controllers are a family of easily available devices whose hackability is informally supported by online DIY communities. Easy to open and containing joysticks, accelerometers, gyroscopes, Bluetooth and IR cameras, they are excellent tools for the affordable and rapid prototyping of tangible interactive systems. In this studio we hope to build some basic skills to equip participants with the confidence and knowledge to use these devices in their future prototyping and design efforts.

Keywords

Hacking, Wii Remote, Wii Nunchuk, DIY.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

design

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Introduction

The Nintendo Wii remote is a widely available game controller that contains a 3-axis accelerometer, an infrared camera with the ability to track up to four spots, and built-in Bluetooth. With expansion devices such as the Wii Nunchuk (containing another 3-axis accelerometer and joystick), the Wii-motion plus (which contains a gyroscope), and other extension controllers, hackers and designers have at their fingertips a family of affordable off-the shelf devices that cost considerably less than their component sensors purchased alone (at least in small quantities). These devices are relatively easy to disassemble and reassemble. A cursory Internet search reveals numerous sources of free-to-cheap software that one can use to connect these devices to a computer. The data generated by the device's sensors can be interpreted and displayed using open-source libraries in C++, Java or the Processing environment. The data format used for communication between extension controllers, Wiimote and computer is also well known. Thus, using microcontrollers, the data can be easily manipulated to enable interaction in both digital and physical space. In short, the Wiimote and its extension controllers are a powerful platform for rapid prototyping of tangible interfaces.

Studio Proposal

We expect three main learning phases for participants in this studio. First, using simple test programs we will get a feel for sensor ranges and calibration so that participants can understand what sort of input they might expect from the Wiimotes. Second, we will play with mapping these sensor inputs to simple interactive sketches in Processing – where much of the fun and artistry lies. Concurrently, we will become familiar with

a few basic configurations of Wiimote, Nunchuk, computer, and/or microcontroller.

Expected skills:

- Basic hardware skills: competence with prototyping simple circuits on a breadboard.
- Basic programming skills with Arduino and either Processing or Java.

Expected preparation:

- We will expect participants to bring a laptop computer with Arduino, Processing, and required libraries installed, their own Wiimote and Nunchuk (less expensive clones from <http://www.i-con-products.com/> are acceptable) and to have already paired the devices. We will provide an online guide to ease the preparation process. If this presents difficulties for people who want to participate, they may contact us to figure out alternatives.

Studio Topics to be covered

The topics to be covered will be:

- Pairing the Wii remote and computer, displaying accelerometer and IR camera data in DarwiinRemote (on Mac) or WiinRemote (on PC) in order get a feel for sensor ranges and calibration.
- Using the Wiimote and Nunchuk buttons and accelerometers as input for simple Processing sketches.
- Using the Wiimote IR camera as an input for a simple Processing sketch.
- Connecting the Wii nunchuk to an Arduino.

We believe that mastering these basic arrangements will prepare participants to explore more elaborate prototyping capabilities on their own.

Studio Learning Goals

The aim of the Wiimote Hackery Studio is to bring together a dynamic and diverse group of artists and designers and hackers (oh my!) to explore the potential of the Wiimote as a material and a tool for building or prototyping interactive systems.

The goals of Wiimote Hackery include:

- To get a feel for the Wiimote as a material, to understand its hackable capabilities, and to know what sort of behavior to expect from its sensors.
- To build connections amongst people from different cities and institutions, who share a love of design and hackery.
- To build a set of skills that will allow participants to access and hack Wiimotes and extension controllers comfortably for rapid prototyping of tangible interactions.

Studio Supporting Web Documents

Wii hacking communities have already established an online presence and can provide us with many resources in support of our Wiimote hackery. A comprehensive list and setup guide will be posted on our workshop website:

<http://web1.hexagram.ca/~awilliam/wiimotes/>.

An abbreviated list appended here includes *Software and libraries for accessing wiimote data*:

WiinRemote for Windows PC --

<http://onakasuita.org/wii/index-e.html>

DarwiinRemote for Mac OSX --

<http://sourceforge.net/projects/darwiin-remote/>

Wiimote and Extension Controllers' data format --

http://wiibrew.org/wiki/Wiimote/Extension_Controllers

Wiimote + Arduino or Processing resources:

Connecting a nunchuk to an Arduino --

<http://hex705.wordpress.com/2009/10/18/wiihack-montreal/>

How to Use a WiiMote in a Processing Sketch --

<http://www.brockcraft.com/2008/05/15/how-to-use-a-wiimote-in-a-processing-sketch/>

WiiRemote access Library for Processing --

<http://processing.org/discourse/yabb2/YaBB.pl?num=1186928645/13>

WiiRemoteJ Java library -- <http://www.world-of-cha0s.hostrocket.com/WiiRemoteJ/>

Wiimote + Bluetooth resources:

List of working Bluetooth adaptors --

http://wiibrew.org/wiki/List_of_Working_Bluetooth_Devices (We recommend and can support the Belkin F8T016 Mini Bluetooth Adapter.)

BlueSoleil, third-party Windows Bluetooth stack --

<http://www.bluesoleil.com/download/Default.aspx>

BlueCove, Java Bluetooth API for use with Processing:

<http://code.google.com/p/bluecove/>

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