HUMAN COMPUTER INTERACTION

ASSIGNMENT 1

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SUBMISSION DATE:

17th February 2018

Wii Remote:

The Wii Remote, also known colloquially as the Wiimote, is the primary controller for Nintendo's Wii console. A main feature of the Wii Remote is its motion sensing capability, which allows the user to interact with and manipulate items on screen via gesture recognition and pointing through the use of accelerometer and optical sensor technology.

Features:

- The Wii Remote assumes a one-handed remote control-based design instead of the traditional gamepad controllers of previous gaming consoles.
- This was done to make motion sensitivity more intuitive, as a remote design is fitted perfectly for pointing, and in part to help the console appeal to a broader audience that includes non-gamers.
- The Wii Remote has the ability to sense acceleration along three axes through the use of an ADXL330 accelerometer.The Wii Remote also features a PixArt optical sensor, allowing it to determine where the Wii Remote is pointing.
- The controller communicates wirelessly with the console via short-range Bluetooth radio, with which it is possible to operate up to four controllers as far as 10 meters
- The Wii Remote provides basic audio and rumble functionality. At the 2006 E3 press conference, it was revealed that the Wii Remote has its own independent speaker on the face of the unit.
- At the E3 2006 trade show, Nintendo displayed white, black, and blue controllers; press images released for the event featured white, red, silver, lime green, and black versions.
- Since the release of the Wii console, people have been exploring different new ways in which to use the Wii Remote. Many third-party applications are currently in development through Wii homebrew.
- One popular Windows program called GlovePIE allows the Wii Remote to be used on a personal computer to emulate a keyboard, mouse or joystick. Connecting the Wii Remote to a personal computer is done via a Bluetooth connection. The Bluetooth program BlueSoleil has been proven to successfully connect a Wii Remote to a PC. Still another program (like GlovePIE) is needed to utilize the Wii Remote's protocol and to use the data it offers

Specifications:

- The body of the Wii Remote measures 6.2 in (160 mm) long, 36.2 mm (1.43 in) wide, and 30.8 mm (1.21 in) thick.
- The Wii Remote uses two AA batteries as a power source, which can power a Wii Remote for 60 hours using only the accelerometer functionality and 25 hours using both accelerometer and pointer functionality.
- The Wii Remote contains a 16 KiB EEPROM chip from which a section of 6 kilobytes can be freely read and written by the host

- The Wii Remote comes with a wrist strap attached to the bottom to ensure the safety of the device. The wrist strap is tied with a Cow hitch knot. Most Wii games displays a caution screen upon loading to warn the player to use the strap in order to avoid the remote slipping from the grip during erratic movements.
- Nintendo announced a free accessory for the Wii Remote, the Wii Remote Jacket, on October 1, 2007. The removable silicone sleeve wraps around the Wii Remote to provide users a better grip and cushioning.

Pros:

- Expansions such as nunchuk,motion plus,classic controllers.
- Vitality sensor models as well
- Mainstream and well received
- Cult following in many countries i.ee popular among users

Cons:

- Publications have noted specific complaints regarding control. GameSpot expressed that some motions in Cooking Mama: Cook Off failed to transmit or meet expectation during gameplay
- Legal issues:many companies have sues the company for design plagiarism and development fee dues
- Remote synching problems

Microsoft Kinect:

Kinect is a line of motion sensing input devices that was produced by Microsoft for Xbox 360 and Xbox One video game consoles and Microsoft Windows PCs. Based around a webcam-style add-on peripheral, it enables users to control and interact with their console/computer without the need for a game controller, through a natural user interface using gestures and spoken commands.

Features :

● Improved body, hand and joint orientation :

With the ability to track as many as six people and 25 skeletal joints per person including new joints for hand tips, thumbs, and shoulder center—and improved understanding of the soft connective tissue and body positioning, you get more anatomically correct positions for crisp interactions, more accurate avateering, and avatars that are more lifelike.

● Microsoft Store support :

You can now create Kinect enabled Windows apps by using familiar Windows Runtime components.

● Unity Pro support :

For more than just gaming, Unity Pro offers cross-platform rapid prototyping.

● Powerful tooling :

Kinect Studio provides enhanced recording and playback, and Visual Gesture Builder lets developers build their own custom gestures that the system recognizes and uses to write code by using machine learning, increasing productivity and cost efficiency.

● Advanced facial tracking

Resolution is 20 times greater, enabling the application to create a mesh of more than 1000 points for a more accurate representation of a person's face.

Specifications:

Viewing angle: 43° vertical by 57° horizontal field of view

Vertical tilt range: }27°

Frame rate: 30 frames per second

Audio format: 16-kHz, 24-bit mono pulse code modulation (PCM)

Audio input characteristics: A four-microphone array with 24-bit analog-to-digital converter (ADC) and Kinect-resident signal processing including acoustic echo cancellation and noise suppression

Accelerometer characteristics: A 2G/4G/8G accelerometer configured for the 2G range, with a 1° accuracy upper limit.

Pros:

1. Easy setup and tailormade customisation
2. No controllers so no memorizing buttons
3. A lively gaming sense

Cons:

1. Requires too much room
2. Expensive
3. Excessive hand-hovering
4. Voice recognition locale issues

Myo Bands:

The Myo armband is a gesture recognition device worn on the forearm and manufactured by Thalmic Labs. The Myo enables the user to control technology wirelessly using various hand motions. It uses a set of electromyographic (EMG) sensors that sense electrical activity in the forearm muscles, combined with a gyroscope, accelerometer and magnetometer to recognize gestures. The Myo can be used to control video games, presentations, music and visual entertainment. It differs from the Leap Motion device as it is worn rather than a 3D array of cameras that sense motion in the environment.

Features:

● a Bluetooth 4.0 low energy connection

● proprietary muscle activity electromyography (EMG) sensors

● an ARM processor

● 9-axis inertial measurement unit (IMU)

● a rechargeable lithium-ion battery

● Micro USB charging

● haptic feedback

Specifications:

● Arm size: Expandable between 7.5 - 13 inches (19 - 34 cm) forearm circumference

● Weight: 93 grams

● Thickness: 0.45 inches

Sensors: Medical Grade Stainless Steel EMG sensors, Highly sensitive nine-axis IMU containing three-axis gyroscope, three-axis accelerometer, three-axis magnetometer

● LEDs Dual Indicator LEDs

Processor: ARM Cortex M4 Processor

Haptic Feedback: Short, Medium, Long Vibrations

Communication: Bluetooth

Pros:

- Simple setup
- Fun to use
- Substantial application library
- Ease of use

Cons

- Unattractive design
- Sizing won't fit all
- Uncomfortable over long periods of time
- Gesture recognition needs improvement

Oculus Rift :

The Oculus Rift is a virtual reality headset developed and manufactured by Oculus VR, a division of Facebook Inc., released on March 28, 2016.

Features :

- Field of Vision and Latency :

At its core, the Oculus Rift is a virtual reality (VR) headset, and this is not a new concept to the world of gaming technology. Its initial support will be for PC gaming, though future console support is being hinted at.

The Rift features a 100 degree diagonal field of vision, which is much wider than is usually found on traditional VR headsets.

The second feature is latency, the Rift is touted to support much lower latency than competing product, resulting in an experience that tracks head movements in a natural way.

● Game Support :

The team at Oculus Rift have been intelligent in being aggressive in building game support early on, particularly with the first-person-shooter genre of games that would be best served by a VR gaming product.

● Not Vaporware :

One of the most important features of the Oculus Rift is that it genuinely went to market. Many highly anticipated Kickstarter projects have featured attention-grabbing sales pitches, but floundered in implementation and going to market.

Specifications :

Product type: VR Headset

Sensors: Accelerometer, Gyroscope, Magnetometer, 360-degree positional tracking

Field of View: 110 degrees

Resolution per Eye: 1080 x 1200

Pros :

● Provides greater immersion into gameplay

● Can be utilized for healthcare applications as a therapeutic device

● Development kit cheaper to buy than most VR systems today.

● Rendering quality is good

● Latency with orientation detection is good

Cons :

● Prolonged use can cause eyestrain

● Without properly configuring the game first, you begin to feel nauseous the moment you start up the game

● The view for each eye lens can end up subtly different (shadow or reflection on one eye, but not the other) breaking immersion quite a bit.

Neyya(Fin Ring):

Fin is a small wearable of its kind, trendy gadget that you can wear on your thumb, which helps you to control your entire digital world. It uses smart Low Energy Technology such as Bluetooth for communication with connected devices such as Smartphones, TVs, automobiles and home automation devices.

Features:

● Three different device compatibility with single fin

● Recognizes each division of fingers

● Fin acts as security authenticator

● Gesture interaction on palm

● Fashionable

● Waterproof, dust proof, durable

Specifications:

Waterproof

Size/fit: Flexible

Battery: Li Po custom battery with micro-USB charging dock; lasts a week;

Sensors: Fin can track accurate movement of your thumb on the palm also detect each part of your finger where you are touching

Communication: Bluetooth 2.1+ EDR and 4.0

Compatibility: Windows, MAC, iOS, Android, Windows Phones.

Pros:

● Tiny hence high portability

● Light, dustproof, waterproof and durable

● Affordable and acts as security authenticator

● Big asset for the visually challenged

Cons:

- Less amendment to specifications to be expected as it is a startup and has less funding
- Easy to replicate
- Easy to lose as it is tiny and no tracker in case of loss