

Hand Tracking in HCI Framework Intended For Wireless Interface

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Abstract:- — Despite significant progress in technology the interaction between human and computer goes traditional way. However, HCI framework introduced various ways to interact. To support the unfamiliar user we are creating platform by use of infrared LEDs and Wii-mote which leads us to sense the hand movement through infrared sensor. Moreover, we are emphasizing on usability in other various fields such as 3D image, gaming to have better and simpler interaction.

Keywords HCI Framework; Wii mote; infrared sensing; IHCI, HID

1. INTRODUCTION

Traditional interaction by keyboard and mouse with the computer is more suitable for 2D environment applications, but in 3D environments it become more prevalent as user input need to trace in 3D scope which causes to create new approaches. An immersive 3-D interface is better, but is often cost prohibitive. An infrared IHCI HCI (InfraHCI), presents the design and implementation to track out gestures made by the user's infrared LEDs which work as medium of interaction between user and Wii-mote. A 3D interface used by the Nintendo Wii Remote during these gestures interpretation and visual parameters to control the view the Wii-mote is used. Hand tracking movement in our project manipulates new patterns with ease. . Moreover, IHCI many other applications that can be used for gesture control provides an extension basis.

2. LITERATURE SURVEY

Introducing a technology and deployment are two different terms .As the most of the time period of interaction between human-computer has been done in traditional manner. But 3D-point recognition and natural user interfaces has been introduced in 1992 (C.Tomasi and T.Kanade).Seens then number of efforts are beaming towards the development of system and their deployments has been done. After the introduction of Wii remotes in 2006 by Nintendo efforts are underway to create a 3D user interface. There were several earlier experiments with 3D interaction such as in the Mirror (Fry, 2004). Several other projects are their which make use of Wii remote & MATLAB are there, but each of them has some drawback of their own. A recent one is Spherical Blurred Shape Model for 3-D Object and Pose Recognition : Quantitative Analysis and HCI Applications in Smart Environments (Oscar Lopes 2014) based on Kinet but there is need of to store facial expression data and Hand poses data .Before that,Gesture Recognition with a Wii Controller(Thomas

Schl'omer,2008) , Location Tracking by Hybrid Infrared (Johnny Chung Lee, 2010) & Head Posture Measurement (Jongshin Kim,2012) were there ,all these needs Wii-mote & Libraries to handle gestures. Another Similarity Matching-Based Extensible Hand Gesture Recognition (RenqiangXie ,2015) which have segmentation algorithm for detection of gesture have accuracy over 97% but needs addition of patterns by user.

Also the affordability and flexibility of the software is a major part.

3. PROPOSED SYSTEM

3.1. Connection Module

If your PC is paired Wii thick, and a HID - compliant device will be known as. So in order to connect the device, we turned the device management. Win32 API is required to use. Unfortunately this is not the built-in .NET runtime support for this API, so we solicit to enter the area.

If the Wii is roughly as follows to start the dialogue process:

1. Get GUID window class defined by HID.
2. A list of all those who are part of the handle to get the HID class devices.
3. Reveals through his room and get detailed information on each of the devices.
4. Compare the vendor ID and product ID to the known Wii mote's VID and PID.
5. The device read / writes to create a File Stream found.
6. Clear device list.

Device Path member Win32 opening of the extension structure or device can use to handle that is in a non-file system path. This action will allow only file system paths to the net ways , so we must use instead of Win32 method .You can also call us to Create File returned Safe File Handle object that you use to wrap the handle will notice .

3.2. Wii Mote I/O and HID

HID's world, data is sent and "report" as received. Simply, it determines that the buffer contained in the report with a title of a predetermined length is a data buffer. The Wii will send obese and 22 bytes in length, all of which various reports can be obtained. Now we have to communicate with the Wii remote, which is a File Stream that, we can start communication. The report will be sent and received almost continuously since the asynchronous I/O is used for operations that are required. In .NET, it's pretty simple. Process run asynchronous read operation and the buffer is full, the run to ensure the callback method. The callback is executed, data is processed, and the process repeats.

3.3. System Architecture

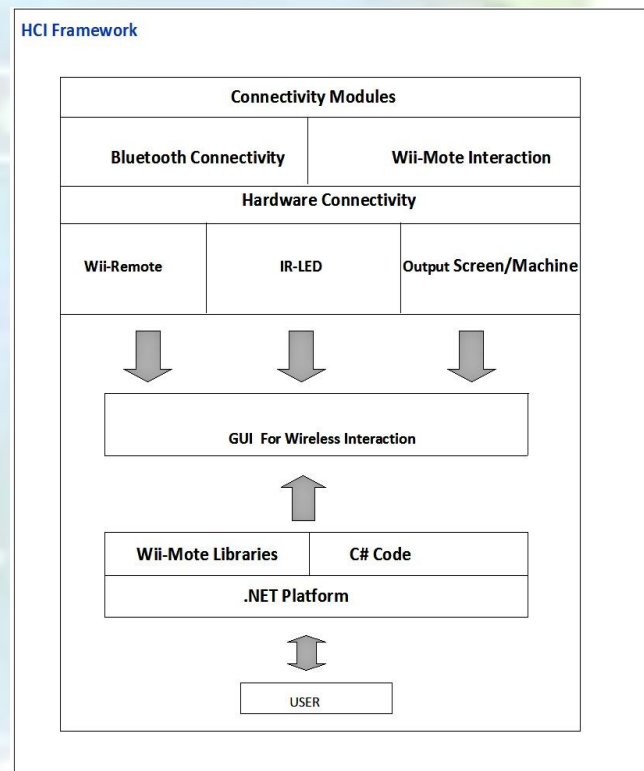


Fig.1 System Architecture

4. ALGORITHMIC STEPS

In purpose of understanding the movement made by the user a system records the movement. System then compares recorded movement and calculates user

perception. For hand tracking user perception can be matched with 3 basic hand moments.

Mapping of the New Relative Point (NRP) is done by following algorithmic steps.

Step 1: Start

Step 2: Define the number of monitor.

Step 3: Single Monitor Screen take center (0,0)

Step 4: User movement Perception & Translation

For Pitch movement

Hand Down movement

Up word movement of mouse

Hand Up movement

Down word movement of mouse

Perform Translation.

Step 5: End.

5. APPLICATIONS

5.1 Primary Gesture

Pinch : Activation of pinch gesture is done when the two points appeared & close enough together that they saw as a point. In opposite unpinch actions that activate when a pinched point separates back as two different points. A unpinch action only after notice in a pinch it, keeping the Wii-mote from the false recognition of two unrelated points in a unpinch action.

Swipe: Swipe is slide movement of points which can activated when the points to move a set distance of any measure. Capturing the movement of one or two points is depending on how many Wii-mote saw. It can be in either direction Left-Right, Up-Down etc.

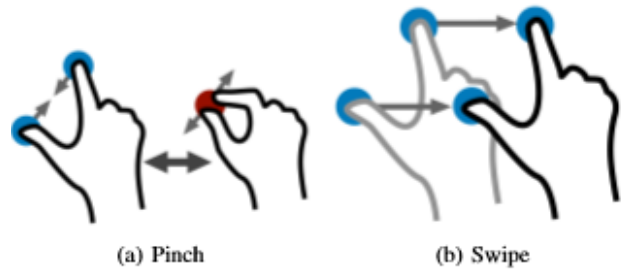


Fig.2 Gesture Pattern

5.2. Synthesis Gesture

As discussed above in conjunction with the current state of the Primary gestures and points, application specific C gestures can be made. The overall on-screen gestures to activate any movement using just a basic gesture, can be very simple, or as a sequence used in making many gestures, as required complex. Instead of a traditional application for a click unpinch / cursor position and map the movement of the points will then pinch. Apply for Spiegel gestures, with sections describe in detail. Finally, it is an example of more complex state PMOS6 and PMOS7 are off condition. Input NL and NR is applied to the inverter, the inverter output continuously starts discharging according to the input provided.

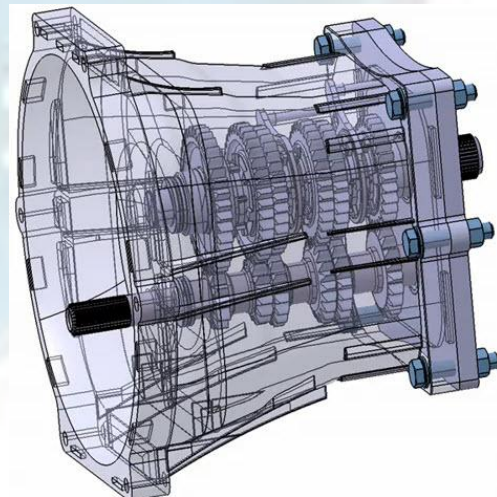


Fig.3 3D Object View

5.3. 3D FRAMEWORK

Multi-dimensional view for gaming, street view, 3D modeling can be provided by 3D framework. Tracking

of point by using the Wii zone, a user can form a spectrum. We expanded our project for a Wii Remote in order to keep costs down by using proprietary software instead of two images acquired 3D point has developed an algorithm to remove. Our implementation uses a two level gesture hierarchy to accommodate custom gesture input. We designed IHCI to be portable, easy to set up, and affordable. IHCI uses two Nintendo Wii Remotes to capture the gesture input from the user. We have also developed an algorithm to extract the 3D point from the two images acquired by the Wii Remotes instead of using proprietary software in order to keep the cost down for anyone expanding upon our project.

6. CONCLUSION

The mapping of gesture system, considering the environment, objects and exterior surrounding. Implementing actual reality with VR system require spatial perceptive like first person or third person perception and how it connect with implemented system.

It is important task to create learning procedure and mapping which further enumerate the importance of Computer as well as human vision to interact with each other. It is also question of learning and model development techniques which further can be developed considering this format with a certain platform to design and develop this technique for implementing actual perception of human user to collaborate a specific application.

System uses the API which consist of Mouse look function mostly use in first person shooter games which must developed at user side considering the globalized solution for algorithm.

Considering the main disadvantage of tracking is only one hand or person at a time can tracked. The system performs invalid operations if more than one person comes into focus. Thus the proposed system can track hand using Wii mote via Bluetooth as the main feature of the project to display the resulted output on the screen.

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