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Human-Computer Interaction: Defense

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Abstract -Human-Computer Interaction deals with the way humans interact with the computer or other devices. This research paper first provides goals of HCI. It then gives information about existing technologies in HCI, Interfaces used in HCI and finally it will explains how HCI can be used in wars efficiently to safeguard the soldiers.

Keywords-Robots ,weapon, sensor, soldier, defense

I. INTRODUCTION

Research provides an overview of an emerging field of HCI and understanding the goals of HCI. There are no agreed definitions of the range of topics that form the area of HCI.
The methods by which human interacting with computers have travelled a long way and it continues. New interfaces are also being designed to enhance the interaction of humans and computers or other devices.
In this paper we will study how the HCI can be used in defense to save soldiers' lives and also provides an idea how it can be done.

II. GOALS

Human-Computer Interaction studies the way in which humans makes use of different interfaces to interact with computers and improve the usability of computers.
The main goal of this research paper is to establish or improve the interaction with robots so that it can copy soldiers body movements, obey his orders and provide the information about the environment in which its working in by making use of interfaces like motion sensors, voice recognition, cameras, etc. so we can send robots in Warfield instead soldiers and ultimately safeguard the soldiers.

III. EXISTING TECHNOLOGIES

The existing physical technologies for HCI basically can be categorized by human senses.
These devices are basically relying on three human senses: Vision, audio and touch.
The new advances in HCI can be categorized in 3 sections:

1) Wearable devices
2) Wireless devices
3) Virtual devices

Examples:
GPS Navigation Systems

- Military Super-Soldier enhancing devices
- PDA
- Canesta Keyboard.

IV. AUDIO BASED HCI

It deals with info acquired by different audio signals.
Key components:

- Microphones
- ASR (automated speech recognition)

The main research areas in this are

- Speech Recognition
- Speaker Recognition
- Auditory Emotion Analysis
- Human-made Noise/sign detection
- Musical Interaction

V. SENSOR BASED HCI

Physical sensors are used in this type of HCI
Some of the sensors range from being very Sophisticated to primitive

- Pen-Based Interaction
- Motion tracking Sensors/Digitizers
- Hepatic Sensors
- Pressure Sensors
- Keyboard, Mouse, Joysticks.

VI. VISUAL BASED HCI

It's an observation of environment using cameras.
In this different aspects of human responses can be recognized visual signals.
The main research areas of visual HCI.

- Facial expression Analysis
- Body movement tracking and gesture recognition
- Gaze Detection

"Sixth Sense" is one of the visual based HCI technologies. This is a wearable "Gesture Based" device.

VII. PROPOSED MODEL

By establishing or improving the interaction between humans (Soldiers) and robots we can safeguard the lives of soldiers and also decrease the chances of defeats in the wars.
What we are actually looking for is to build the robots that has its predefined task and able to use the weapons and other gadgets used in wars.
Then we will establish a connection between soldier and robot and send the robot in war field instead of soldiers. Both soldier and robot will have sensors on their body so that robot will able to copy all the body movements of soldiers. Robot will carry cameras to inform the soldier about the surroundings of robot. Soldier can also give commands to the robot by using mice and voice recognition technologies so that only authorized soldier can give commands to the robot. Robot will carry weapons like gun, bombs and all the stuff that soldier needs in the war .
Robot will able to copy its commanders body movements to tackle enemy attack and it will also have automatic mode because of which it will able to follow commands as well instead copying the movement like plant a bomb or kill any person commander ordered.

Fig:- Robot copying human action

1) (REF: http://www.roadtovr.com/xsens-demonstrates-camera-less-full-body-motion-tracking-at-ces-2013/)
If we manage to do so then we can protect our soldiers because if any casualty occurs it will happen to robot and its commander will be safe. It will make soldier to feel like he is playing a video game.

Fig: human handling robot as he is playing video game

2)(REF: http://www.digitaltrends.com/cool-tech/priovr-mocap-suit-turns-entire-body-gaming-controller/)
Another advantage of it is the soldier can counter any enemy attack even though he is far away from the battle field.

VII. CONCLUSION

Quality of system can be improved of defined by how better it understands its user.
Virtual reality can be the common interface in future.
Wars can become as simple as playing video games and It will provide remarkable protection to the soldiers.

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