

An intuitive motion capture controller to play DOOM

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Introduction

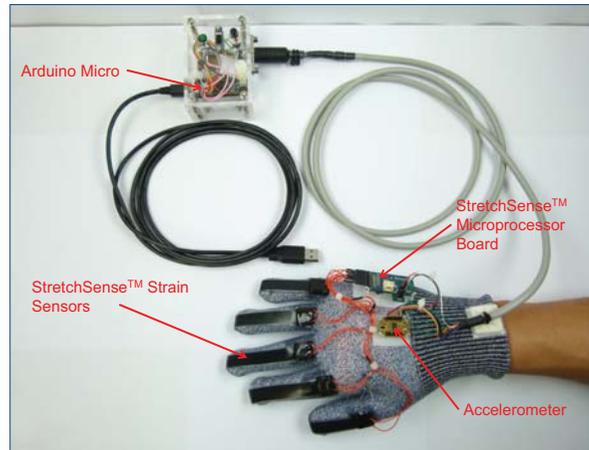
When DOOM appeared on the market in 1993, its true 3D graphics and first-person perspective fascinated gamers all around the world. It is still very popular, but there have not been any major improvements on how players control the different functions of DOOM.

By designing a wearable gesture-based controller as an alternative to mouse and keyboard, we have changed the way players interact with this classic computer game.



Prototype System

- Strain sensors on a fabric glove are used to measure finger movement. A StretchSense™ microprocessor board sends the measured values to an Arduino Micro.
- An accelerometer detects pitch- and roll of the player's hand to control left- and right, backward- and forward movement.
- The Arduino Micro maps the sensor signals to mouse- and keyboard commands, and is used for calibration.



Results

Our gesture-based controller adds an exciting physical component to the game experience. No longer desk-bound, players enjoy a much greater degree of freedom compared to conventional interfaces. The success of commercially available consoles as the Nintendo Wii™ shows that a large number of people enjoy this active gaming style.

Conclusion

Game accessibility is very important to motor-impaired video game enthusiasts [1]. Many of them are not able to use conventional devices such as keyboards or gamepads. Programmable gesture-based controllers, configured to their specific needs, can help them to overcome this barrier.

Potential applications are not just limited to computer games. Many elderly people find it difficult to use buttons on TV remotes and household appliances because of impaired fine motor skills [2]. Using natural gestures is an intuitive way of making technology accessible and easier to use.

Future Work

- To allow an even greater degree of freedom of movement, the controller will be made wireless.
- In addition to the gestures we are already using to control the basic functions shown below, we will implement additional gestures to enable other functions such as "Pause" and "Save game".

References

1. Bei Yuan, Eelke Folmer, Frederick Harris; "Game Accessibility: A Survey", Universal Access in the Information Society, March 2011, Vol. 10 (1), pp.81-100
2. Langensiepen, Lofti, Higgins; "Use of gesture recognition to control household devices for older people", Journal of Assistive Technologies, Volume 4, Issue 4, Dec. 2010

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