New generation of gaming consoles - will gestures finally break through?

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STATEMENT OF THE PROBLEM
The main goal of this research is to find out if the new consoles are able to bring gestures as a successful and even better input solution compared to the remote or the controller in home entertainment systems. Gesture controls used to be difficult to use because of technology and systems, which were both slow and not user-friendly [1]. Nowadays when we have Smart TV and next generation consoles coming out with Microsoft's Kinect 2 and Sony's PS4 Eye, we will see if the gesture controls will finally conquer our living rooms.

Gestures are a natural form of communication to us and they are used to interact with our environment during the earliest stages of our development before even being able to speak [1][2]. Although using gestures with home entertainment systems as an idea seems to be great and simple, they have not yet been widely adopted as the number one input solution.

The first gaming console to strike gold with gestures was Nintendo's Wii as it was the most popular console of its generation. The Wii shifted the experience of virtual world on the screen to the experience of virtual world in the living room [3]. The Wii also gave the tools to be innovative with gestures. One example is a research, which studied the ability to switch music tracks with a simple gesture while running using the Wiimote [4].

Microsoft and Sony also came up with gesture controlled systems with Kinect and Move. Kinect was far more superior in its popularity but as a gaming platform or as a substitute to the remote not very successful. Kinect wasn't accurate enough to be a better input as opposed to the controller. But Kinect reached another audience in researchers and in different fields of science as it was able to perform other tasks, from helping children with autism to assisting doctors in operating rooms. Microsoft calls this the Kinect Effect [5].

None of this generation's consoles were able to make gestures as the main input solution of people's home entertainment systems. But now as both of the next generation consoles Xbox One and PS4 have confirmed that they will have new and improved gesture and voice control [6], this research will be focusing on using them and comparing them to the traditional controller.

RESEARCH QUESTIONS AND/OR HYPOTHESES
The research questions to be addressed in this study are:

- Are the gesture and voice controls more easy to use than the controller, when browsing through internet or the console's interface?
- Which one does the user prefer to use: gestures or controller?
- How much effort does the gesture controls require compared to the traditional controller?

It is believed that the controller will be more easy to use than gestures because people are more accustomed in using traditional controls. For example everybody knows how to use keyboard and mice. In addition gestures usually need more effort from the user.

Without the prejudices people undoubtedly have against gestures and the knowledge on how to use controllers, gesture controls might be the preferred input. If the user doesn't have any information on how to use the controller, gestures are obviously more easy to use.

METHODS AND PROCEDURES
The data for the research will be collected in a room with the appropriate equipment. Equipment used in this case is the PS4, PS4 Eye -camera and a TV. Xbox One will not be used, since it will not be released at the time, when this research will be conducted.

Tests will be conducted one user at a time and the user will go through every task first by using gesture controls and after that using the controller. Gestures and functions of the controller used in the tasks will be explained and presented to the user before beginning the tasks.

Tasks include browsing the internet, using Netflix and changing the settings in the console. The users will be
recorded when they are performing the tasks and when the tasks are done they will answer a questionnaire, which will have all the research questions already mentioned with some additional questions.

Users taking part in the tests will be chosen with the following qualities in mind: gender, experience with the controller, experience with gestures and attitude towards gestures.

Variables
The variables in the research are:

- Speed. How quickly did the user perform the tasks?
- Ease to use. Were the controls easy to use?
- Preferences. Which one did the user prefer?
- Experience. Did the user have experience in one or both of the controls before doing the tests?
- Attitude before using either of the controls. Does the user have positive/negative attitude towards either of the controls?
- Attitude after using both of the controls. Did the user's attitude change after using the controls?
- Gender. Was the user male/female?

Speed and ease of use will be measured by videotaping the user performing the tasks. The other variables will be answered through the questionnaire.

The users taking part in the tests will be selected by randomly selecting 20 people.

Sampling
The people selected randomly will be Oulu University students, which means their age will most likely be between 20 and 35.

The randomly selected people will be selected keeping in mind the variables. Which means trying to take equal amounts of males and females, good or bad attitude towards gestures, experienced with gestures and inexperienced with gestures etc.

Instrumentation
PS4, PS4 Eye-camera, DualShock 4 PS4-controller and a Full HD-capable TV are used to complete the tests. Questionnaires are used to collect the user experiences.

Data collection
Data is collected through the recorded videos and the questionnaires. From the videos the time for performing the tests and the amount of mistakes users made are collected. From the questionnaires the users answer different data is collected: user's attitude, previous experience, gender, preferences and the ease of use.

Data analysis
SPSS will be tool used in processing the collected data. The time it took to perform the tasks and the mistakes made in doing them will be divided in two groups “gesture controls” and “traditional controller”. Almost all the data collected from questionnaires can be put under those two groups, with a few exceptions like the user's gender. The exceptions will be processed independently. Data analysis should provide the results for which of the controls was overall preferable by the users.

LIMITATIONS AND DELIMITATIONS
This research uses only PS4 of the two consoles coming out. PS4 and Xbox One use different technology in their gesture controls and have a different user interface. That means that the results provided in this research could be different when using Xbox One as the platform for the research.

This research will only be focusing on using the gesture controls and the controller in the console's user interface, internet browser and a few applications the console provides. This means games are not included in this research. This is because very few games have both gesture and controller support.

The motivation behind the research also focusing on the applications is the growing usage of this generation's consoles PS3 and Xbox 360 as devices running applications like Netflix, Viaplay, HBO or hulu. These applications provide on-demand Internet streaming media and they are quickly becoming popular. It is believed that because of the popularity of these applications they will have a big role in the next generation's gaming consoles.

People taking part in the research will be adults with their age range from 20 to 35. This will exclude older people and children from the research, who potentially would have provided different results.

SIGNIFICANCE
There are currently very few studies about the next generation consoles and their gesture control capabilities. PS4's gesture control's specifications have not been even released yet, except for the announcement that the system will have them. This means that this research will be one of the first studies made of the system's gesture controls.

The results of the research will give an overall image of the next generation's gesture control capabilities and if they can replace the traditional controller or remote as the main input for the home entertainment system. The results will also provide good information on how to improve the gesture controls for people developing gesture controlled applications for the new consoles.

REFERENCES
1. Bhuiyan M, Picking R (2009). Gesture-controlled user interfaces, what have we done and what’s


6. Xbox One Interface Demo (5/2013). http://www.youtube.com/watch?v=Nqvd06mIrM