

Exploring the Impact of Music on Immersion in Video Games

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Abstract

Immersion is difficult to quantify, and there are many factors that make up what people call “immersion”. This project aimed to assess the impact of music on a player’s emotional state, and whether the presence of music provokes stronger emotional responses. Thirty people

were to be surveyed, who would play through one hour of *Alien: Isolation*, and then asked to fill out a questionnaire. During gameplay, a GSR test would be taken, to measure their levels of emotion and present it in a quantitative manner.

Aims and Objectives

While there has been some research on immersion in games, including some on the impact music has on that, no prior study has used GSR (Galvanic Skin Response) as a method of measuring emotion in combination with a subjective questionnaire.

Goals

- Explore importance of musical score in video games
- Measure players’ emotion response with GSR
- Discuss whether current methods of composition successful immerse the player

Methodology

Participants were to be split into two groups, one of which would play through an hour of *Alien: Isolation* with music, and the other group would play the same hour without music.

After the hour is up, the GSR sensor will be removed, and the data extracted. According to the Seeed GSR sensor product guide (Zuo, 2014), along with the sensor, some additional hardware will be required, these being a Seeeduino V4.2 and a Base Shield.

The participants would have been asked to wear a GSR sensor, which is comprised of two “finger cots”, which connect to the main sensor. The sensor also requires a

microcontroller with a spare ADC (Analogue-to-Digital Converter) input (Seeed, 2020). The participants would play through twenty minutes of *Alien: Isolation*. While playing, participants will be asked to try to breathe normally, limit movement as much as possible and try not to talk. Accommodations will also be made so that they can be seated as comfortably as possible. These precautions are all to prevent any factors from impacting the data and resulting in it inaccurately reflecting their mood during the session; following the guidelines set out iMotions in Galvanic Skin Response: The Complete Pocket Guide (iMotions, 2017).

Methodology (Cont.)

The process follows these steps:

- The Grove sensor is connected to the base shield through its A0 (Analogue 0) port, which is then plugged into the Seeeduino. This is all then connected to a PC via USB.
- The following code was input into Arduino IDE:

```
1 const int GSR=A0;
2 int sensorValue=0;
3 int gsr_average=0;
4
5 void setup(){
6   Serial.begin(9600);
7 }
8
9 void loop(){
10  long sum=0;
11  for(int i=0;i<10;i++) //Average the 10 measurements to remove the glitch
12  {
13    sensorValue=analogRead(GSR);
14    sum += sensorValue;
15    delay(5);
16  }
17  gsr_average = sum/10;
18  Serial.println(gsr_average);
19 }
```

(Zuo, 2014)

- In the Arduino IDE settings, the Serial Plotter tool is chosen, so the software can plot the graph as the data is gathered. The resistor is then adjusted to a serial output of 512.
- Participants will then be free to begin playing the game.
- After one hour, the game session will end, and the software should have produced a graph.

Participants would also be asked to fill in a questionnaire about their experience

Discussion

Zhang and Fu (found that both the “with-music” and “without-music” groups underestimated how long they had been playing for by a few minutes. Experienced gamers who played with music on reported a mean average of one minute less than those who played without music. Inexperienced gamers reported a much shorter time, an average of fourteen minutes, with music, though those with low experience who played without music reported the most accurate time at nineteen minutes. The low experience groups also had a much lower standard deviation within their individual groups than the high experience groups.

Game Experience	Perceived time in minutes (with music)	Perceived time in minutes (without music)
High experience	16.65	17.20
Low experience	14.50	19.60

References

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