Christopher Keo (01386768)
Christopher_Keo@student.uml.edu
4/11/18

Literature Review 3

The two papers being discussed are *Correlation between Heart Rate, Electrodermal Activity and Player Experience in First-Person Shooter Games (2010)* and *Webcam-based detection of emotional states* (2016).

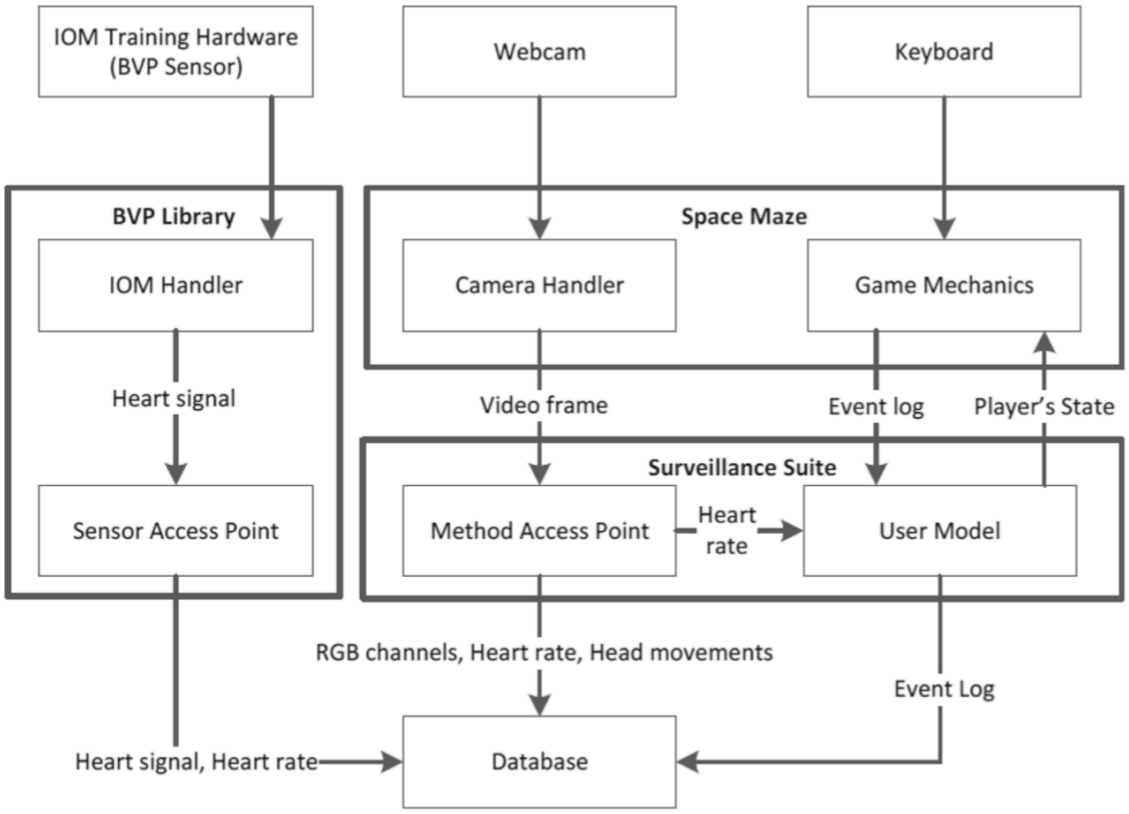
Introduction

The world and playing abilities for video games is expanding and developing at a rapid rate. More and more video game publishers are seeking the technological advances in order to put their game at the top. In the article *Correlation between Heart Rate, Electrodermal Activity and Player Experience in First-Person Shooter Games (2010)* researchers found a correlation between an individual's heart rate (HR) and electrodermal activity (EDA) which correlated with user experience questionnaires. Using the research found in this study the researchers of the article *Webcam-based detection of emotional states* (2016) are trying to see if a emotion based detecting webcam could improve user gaming experience.

Experiments

The researchers of the 2010 study were curious to see if there was a direct correlation to a gaming users HR and EDA when playing videogames and their questionnaire on their gaming experience known as a iGEQ. For this experiment 16 participants were selected to play 3 different first person shooter video games. All three with different weapons, levels and controls. The participants were brought from a range of gaming backgrounds and for the experiment were able to learn the game before conducting the test. Once ready the participants would play for 5 mins and after every 5 min they would answer the iGEQ. While they are playing the game they have monitors hooked up to their body to measure their HR and EDA while playing. The results of the test concluded that there was a covariance between the HR/EDA readings and the iGEQ survey. Overall the study showed that when games were being played that were considered more active and tense users tended to have increased level of HR/EDA. But also during times of non stressful and active situations. While their was covariance at the conclusion of the study it set some groundwork for user experience being enhanced through user experienced emotion. This study leads to one in 2016.

For the study in 2016 researchers wanted to test a web based camera to detect gamer emotion which could then be used to create adaptive intelligence in games. This experiment sought to test the ability to predict users emotional states based on video taken while they played. Participants were to play a game which would be set at easy and hard whilst doing so they would be recorded and have their emotions monitored and recorded. The chart below is an overview of the system that the researchers created for their experiment:



The IOM training hardware detects the physically monitored emotions, the webcam records the user's facial expressions and movements through out the game and the keyboard records users actions. Surveillance Suite is the Unity 3D (gaming software) program used for this experiment which allows them to create and manipulate simple games they've created. Once the tests were concluded the software and web cam were able to predict 76% accurately a user's emotional state.

Conclusions

Paper 1 and Paper 2 both studied the user gaming experience through the monitoring of a gamer's emotional state. In conclusion researchers found that users emotional states are a bid indicator for user experience. Both positive and negative and by gathering this information it can be used to adapt artificial intelligence which could in turn enhance a users gaming experience.

Works Cited

Anders Drachen, Lennart E. Nacke, Georgios Yannakakis, and Anja Lee Pedersen. 2010. Correlation between heart rate, electrodermal activity and player experience in first-person shooter games. In Proceedings of the 5th ACM SIGGRAPH Symposium on Video Games (Sandbox '10), Stephen N. Spencer (Ed.). ACM, New York, NY, USA, 49-54. DOI: https://doi.org/10.1145/1836135.1836143

Dingli, A. & Giordimaina, A. Vis Comput (2017) 33: 459. https://doi.org/10.1007/s00371-016-1309-x