

Weekly Report

Team Physion

Week 6 (02-15-2010)

Things we did

1. Review of Project in CS using brainwave device

Title: MIND READING: Analyzing EEG Data for Human-Aided Video Retrieval

The original intent was to use EEG signals to reduce the time required to physically mark an image as relevant; unfortunately, the classifier using thought alone performed poorly.

There was also noise issue. "Initially, there was great concern that the EEG signal would contain far too much noise to possibly yield any positive results." They solved it by "to combine many trials of the same mental action together". This project is not directly related to ours unless we use EEG.

2. Research on former ETC projects

1) Augmented Cognition (2004)

The website said that checking 'pupil' is not working well. However, we couldn't find how they used biofeedback. Jesse, the advisor of the project, was out of town this week, so we will schedule to meet in next week.

2) Night of the Living Dead (2006)

The website didn't show much information. Theme is similar but game is different. It's 'strategy horror game'. We don't need to request more information.

3) Review of Project of Serious game (2009)

The program gathers data such as which path player goes, how many cans are picked up, and which action player does with the time during the game.

They made script to record the data, but it's not on the website. The programmer of the team, Amith, might still have it.

3. Purchase of Wiimote gun

For the gun, we think to use several guns in the game. We will try various models and find which will work properly.

1) Black + White Pistol Gun Controller for Wii Remote

\$8.82

<http://www.dealextreme.com/details.dx/sku.29212>

Looks ok and very cheap for two guns. It would be very light so easy to play.



2) 5-in-1 Laser Light Gun for Wii Remote

\$11.81

<http://www.dealextreme.com/details.dx/sku.9642>

For calibration, it might be easier if we have a gun with laser pointer.



3) HOUSE OF THE DEAD OVERKILL HAND CANNON (WII)

\$35

http://cgi.ebay.com/HOUSE-OF-THE-DEAD-OVERKILL-HAND-CANNON-WII-NEW_W0QQitemZ180463277821QQcmdZViewItemQQptZVideo_Games_Accessories?hash=item2a047316fd

It is official product for the famous gun shooting game 'the house of the dead'.

Quality will be good.



4) Wii Sniper Rifle Gun

\$36.07

http://www.amazon.com/Wii-Sniper-Rifle-Gun-Nintendo/dp/B0031QBXJW/ref=sr_1_2?ie=UTF8&s=videogames&qid=1266362365&sr=8-2

It looks nice. We can take out parts and use different gun such as blaster, rifle.



4. Game Design

1) Game Engine - Unity 3D

We looked into Unity 3D engine as Lockheed Martin suggested. We think it can give us better graphics and easier programming rather than Panda3D. We will use Unity 3D.

2) Art style - Realistic

Between comedy (such as Zombies and Plants) and Realistic (Left 4 Dead), we choose realistic.

We expect that it can give more immersive, scary feeling to the player.

3) Game background - 18th century Europe

In 18th century Europe, Professional zombie hunter (knight) fights against zombies in Church with graveyard. The bad boss is the 'priest'.

Things we will do

1. IR sensor bar

1) Discussion with Steve Audia

He has a big screen at home. To play Wii, he uses a customized wii sensor as big as the size of the screen. We might consider making our own sensor bar. In last semester BVW, Mark's team made a small IR light with 9V battery and Chris' team used AA battery. We will ask them.

2) Commercial Product

There is a safety glass with IR led flashlight. The second year student Sharkee has it. Yantong will contact him. We might take out IR light from the glass and put on the screen.

2. Game Design

Based on our background, we will develop a game design and scenario. We hope that meeting with Jesse will give us some inspiration.

3. Game Programming

We will try to make a very simple prototype such as shooting boxes as early as possible.

- 1) Study Unity 3D engine.
- 2) Integrating Unity 3D with IOM (GSR and heartbeat sensor).
- 3) Integrating Unity 3D with Mindset (Brainwave).

3. Art Work

We will develop concept art and modeling.

4. Purchase New device

While we continue our research on device, we found a new device, Emotiv. It's faster and gives more data than our current device, Mindset. We would like to purchase and try this item. As this item provides SDK, it won't be hard to develop a game with it. However, we have only 2 weeks to work until half presentation, we will continue our work on Mindset for in case.

<http://www.emotiv.com/apps/sdk/179/>

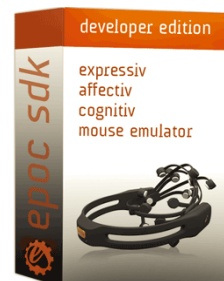
Price

\$500 including Software Developer Kit

Pros

1) Fast data refresh rate

Emotiv detections are mostly updated 4 times per second (Cognitiv, Affectiv, some Expressiv). Event-driven detections (such as blinks and winks) are output immediately after detection. If we receive raw EEG data or gyro



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signals, these are measured 128 times per second. EEG data is only available with Research, Education and Enterprise Plus licenses.

2) Various data detection

Expressiv: real-time detection of blinks, left/right winks, horizontal glances left/right, eyebrow raise, furrow, smile, smirk left/right, clench teeth, laugh

Affectiv: Excitement (short-term and long-term), Engagement/Boredom, Meditation, Frustration.

Cognitiv: NEUTRAL plus up to four trained actions selected from forward and backward motions on each of 3 axes, clockwise and anticlockwise rotations about each of 3 axes (12 detections)

Gyro: 2-axis gyro detects accelerations (nodding, shaking head)

EEG (Research, Education and Enterprise Plus licenses only): 14 channel data at 128 samples per second