

gamEmotion: A LauzHack Logitech Challenge Winner

Introduction:

The LauzHack competition is a student-run hackathon organised at EPFL, Lausanne. So, what's a hackathon? It's a creativity marathon, where attendees work in teams of up to four and put their ideas together to create something exciting within a limited amount of time. It gives teams of hackers a chance to turn their ideas into reality. The LauzHack 2016 was a first-edition hackathon where about 200 like-minded student-hackers were hacking together for 24 hours to make something of their interest.

Participants at the LauzHack are free to develop a project with their own ideas. In addition the various sponsors of LauzHack provide different challenges, API-kits and tools, which the students are free to incorporate within their projects. These challenges have prizes too! This year four students from the Department of Computer Science at the University of Basel participated at the LauzHack and were awarded as winners of the Logitech Challenge (who were the main sponsors of the event) for their project »gamEmotion«.

Team-members:

Dennis Madsen

Patrick Buder

Rufus Lobo

Viacheslav Sharunov

(all students studying Masters of Computer Science)

The Idea:

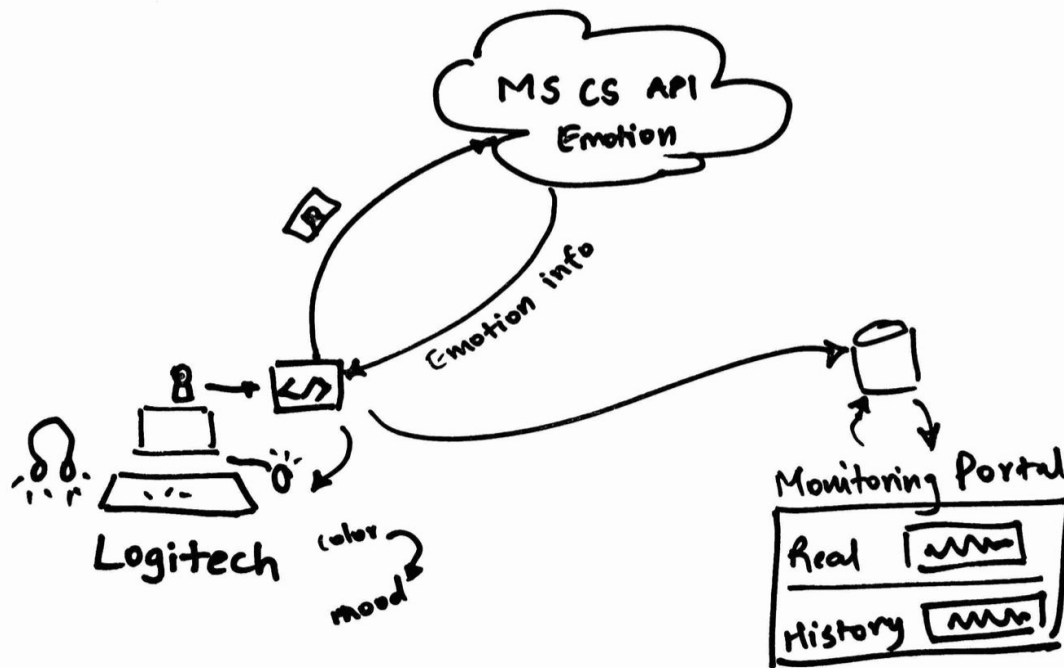
The idea for gameEmotion was conceived by combining two challenges available at the LauzHack. The first was the Logitech challenge who provided gamer gear (keyboard, mouse and headset). These have embedded LEDs which can be programmatically lit up. The second was the Microsoft challenge where they provided free access to the Microsoft Cognitive Services API for interesting and innovative uses. Both sponsors challenged the participants to use their technologies as innovatively as possible. The team thus came up with the idea to develop a tool that captures a gamer's emotion and enhances the gaming experience by providing a feedback via the gaming console. This tool is designed for two primary uses:

1) Game developers can get actual real-time feedback about the emotions of the playtesters and verify the results against the intended storyline of the game. In an iterative process this could help develop more engaging games.

2) A next step would be for the gameplay to include gamer's emotion as an input and provide a more personalised experience for each player of the game.

The Implementation:

The gamEmotion prototype is primarily developed on the Python platform. It has a client server architecture as shown in the below figure:



The client program interfaces with the camera and records pictures iteratively. These pictures are then sent to the Microsoft Cloud where their Cognitive Services Emotion API is invoked. This service returns details of the emotion analysis of the image. The response contains confidence values which ranges from 0 to 1 for different emotions. The emotion with the highest confidence value is considered the emotion of the image. The client program changes the color of the Logitech gaming equipment depending on the emotions in the image. In the prototype developed, the gaming equipment lights up to reflect and also enhance the existing mood of the gamer. For example, when the gamer is angry, the gaming equipment turns red!

In addition, the client program also uploads the emotion response received from the Emotion API onto a database server. A web based monitoring application queries this database and displays the information from the database in form of graphs. The monitoring application prototype was developed using the Web2Py framework which comes with a built in SQLite database. Since the Emotion API data is structured and has a schema the SQLite database servers the purpose for this prototype. For a full application a more scalable database would need to be considered. The use case for the monitoring application is primarily for the game developer's test environment wherein the emotional level of the gamer may be used as a means to evaluate the goals of the game story. We believe this is a more real feedback for a game as compared to surveys.

Future Work:

As future work, we see such technology being incorporated within games which could have a dynamic storyline that takes the gamer's current emotion as an input. This would provide every gamer with a unique experience of the same game. Also, additional sources like a pulse rate and the player's voice content could also be analysed to perform a holistic gamer emotion analysis.

Video: https://www.youtube.com/watch?v=3CO_xqI0jyo