Video Game Playtesting with Physiological Data Acquisition

Valve, an American video game and hardware developer, would like **you**—yes, I'm looking at you, 2019-2020 SCOPE Team—to help them use physiological data to improve video game playtesting. Keep reading to simulate what such an endeavor looks like.

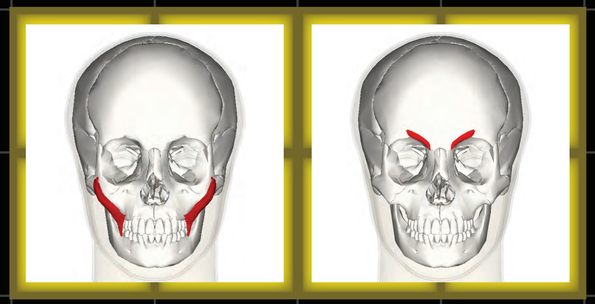
Scenario

You are a **video game designer** about to drop the new Tetris3000, a game similar to the famous Russian tile-matching puzzle game, but better in 3000 different ways. You need some **playtesters** to thoroughly test your game to confirm that it **maximizes enjoyment** while **minimizing unexpected frustration**. However, it's difficult to manually observe internal states and **subtle emotional reactions**, especially while watching hundreds of **hours of gameplay**...

Your Mission

Research, test, and validate the viability of **physiological sensors** and subsequent **data analysis** methods in augmenting the current playtesting system.

Hint: **Facial electromyography (fEMG)** is especially useful in measuring **valence**—whether an emotion is positive or negative. In particular, the *zygomaticus major* is highly correlated to positive emotions while the *corrugator supercilii* is highly correlated to negative emotions.



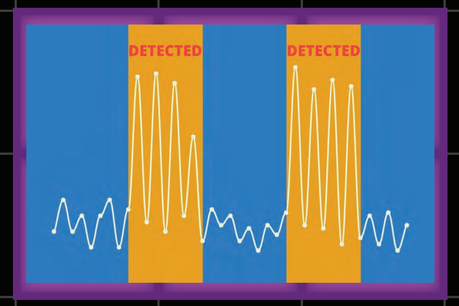
Zygomaticus Major [1] *Corrugator Supercilii* [2]

Your Journey

For your experiment, you decide to actively **induce frustration**. To avoid confounding variables, you pick a well-known game with easy-to-map elements (i.e. regular Tetris, not Tetris3000). You introduce unexpected interruptions at semi-regular intervals that interfere with the game. After collecting hours of game data and fEMG data, you develop an algorithm for **feature extraction** and **machine learning** to pick out the features of the fEMG data associated with the known disruptions in order to **predict frustrating events in gameplay**.

Progress!

Congratulations on all the progress you have made this year! You have been able to identify which physiological sensing and data analysis techniques have the **potential** to identify frustrating events and are **worth pursuing**, as well as document in detail how to implement such techniques. This is a **major step** toward creating a system that can highlight important events in a game for game designers (like you!) to review. Who knows, it could one day even be used in virtual reality (VR) gaming!



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References

1. Wikimedia Commons contributors. "File:Zygomaticus Major Muscle Frontal.png." Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Zygomaticus_major_muscle_frontal.png.2. 2
2. Wikimedia Commons contributors. "File:Corrugator supercilii muscle frontal.png." Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Corrugator_supercilii_muscle_frontal.png.