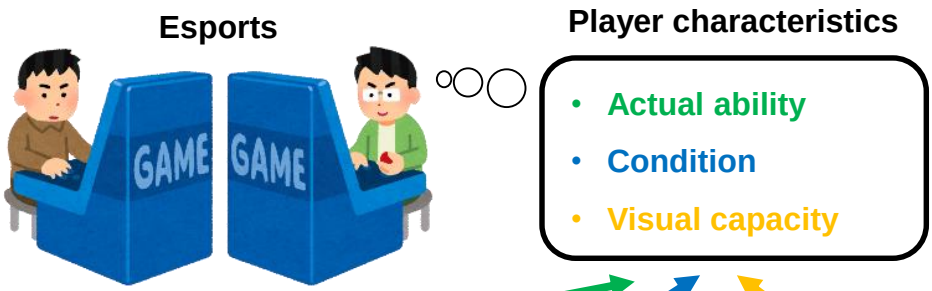
27 Special cognitive abilities of esports experts

Performance, physiological state, and brain activity

Abstract

Since esports is not easily influenced by physical factors, it is said that their actual ability, condition, and visual capacity are difficult to analyze. To objectively evaluate these characteristics of esports players, we have investigated the relationship between game performance and the physiological/brain states of esports players by taking a neuroscience approach. The results of our experiments show that synchrony of heart rate between players reflects their actual abilities and that parietal brain activities are associated with the outcome of the next round. Further investigations, including a vision-science-based test of the capacities of visual information processing of esports players, will reveal the physiological/brain states and cognitive capacities related to performance and will enable us to establish a neuroscience methodology for esports players to improve their performance in competitive environments.

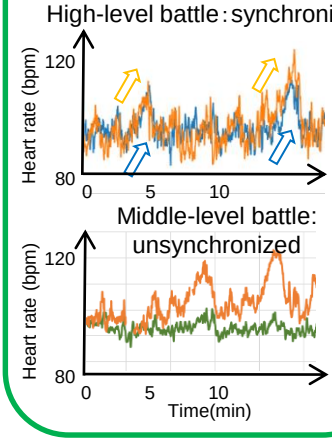
Esports and player characteristics



Approach

Heart rate (HR)

Synchrony of HR reflects actual abilities of players [1]



Brain activity

Brain activities are associated with the outcome of next round

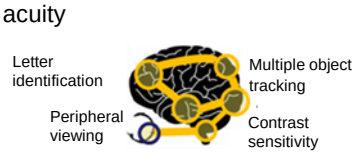
Parietal brain activity **increases**

Parietal brain activity **decreases**

Visual test

Examination on superior visual capacities of players

Focusing on the various types of visual capacity as well as visual acuity



Measuring capacities using our unique vision test battery [2]

References

[1] K. Watanabe, N. Saijo, M. Kashino（2019）"The across-player correlation of the physiological change reflecting the fight-or-flight response in esports." *Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2019*. Online. Program No. 769.20.

[2] K. Hosokawa, K. Maruya, S. Nishida, M. Takahashi and S. Nakadomari（2019）"Gamified vision test system for daily self-check," *2019 IEEE Games, Entertainment, Media Conference（GEM）*, New Haven, CT, USA, 2019, pp. 1-8.

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