

BACTERIA HUNT

A multimodal, multiparadigm BCI game

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Brain-Computer Interfaces (BCIs) allow users to control applications by brain activity. Among their possible applications for non-disabled people, games are promising candidates. BCIs can enrich game play by the mental and affective state information they contain.

Current BCI research games are often very limited, restricting themselves to the use of one modality (BCI) and one BCI paradigm, to control one type of interaction in a very simplified game.

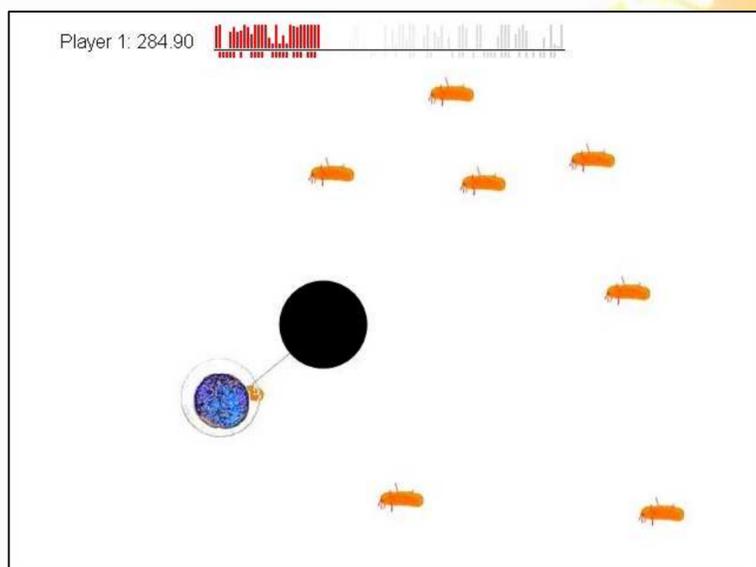
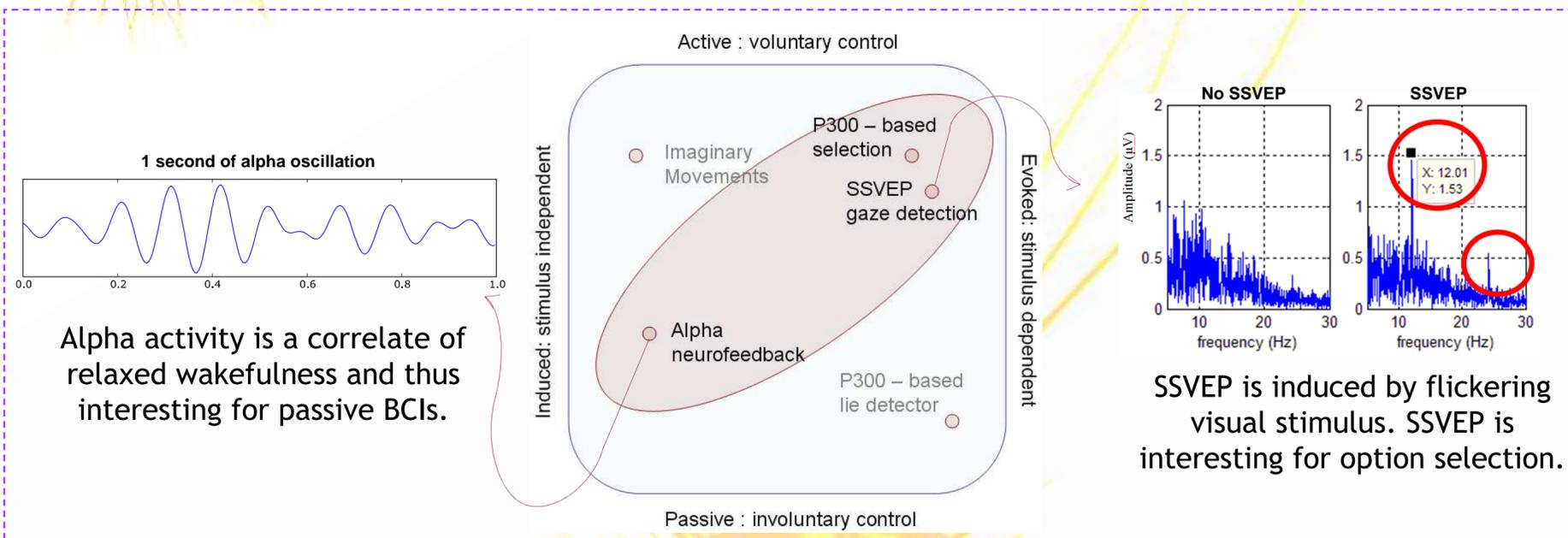
Bacteria Hunt [1] is a game combining traditional game control with different BCI paradigms.

Bacteria Hunt was used in preliminary experiments and proved to be a valuable research platform to investigate:

Multimodality Concentrating on multiple modalities at the same time and artifacts this may introduce

Multiple paradigms Possible interference effects of using two BCI paradigms simultaneously

User experience Influence of different control modalities on engagement and game experience



In Bacteria Hunt user *controls* the blue amoeba in order to *eat* as many orange bacteria as possible within given time. The game is played using the keyboard and/or the EEG signals measured from the brain. Different interaction possibilities are provided through game levels:

Level 1	Control: Keyboard Eating: Keyboard
Level 2	Control: Keyboard + alpha power Eating: Keyboard
Level 3	Control: Keyboard + alpha power Eating: SSVEP

[1] C. Mühl, H. Gürkök, D. Plass-Oude Bos, M.E. Thurlings, L. Scherffig, M. Duvinage, S. Kang, A.A. Elbakyan, M. Poel, and D. Heylen, Bacteria Hunt: A multimodal, multiparadigm BCI game. In: Proceedings of the eNTerFACE International Summer Workshop on Multimodal Interfaces, To appear, 2009.

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