

HOW DO BRAIN-COMPUTER INTERFACES IMPACT AUTONOMY?

Being autonomous implies, roughly in a common understanding, that one is capable of determining actions one wishes to accomplish. But how is autonomy affected when the action is mediated by a brain-computer interface (**BCI**)? This paper considers both positive and negative effects.

Reference: Friedrich, O., Racine, E., Steinert, S., Pömsl, J., & Jox, R. J. (2018). An Analysis of the Impact of Brain-Computer Interfaces on Autonomy. *Neuroethics*, 1-13. [DOI:10.1007/s12152-018-9364-9](https://doi.org/10.1007/s12152-018-9364-9).

WHO SHOULD READ THIS?

In this paper, philosophers, potential BCI users, and interested publics can learn about some philosophical questions that arise in the use of neural technology. Engineers and information scientists can also use these considerations to inform their work in developing BCIs.



WHAT IS IT ABOUT?

BCIs are a type of neuroprosthesis that detect and process brain activity in order to direct external electrical/technological devices without the involvement of the user's peripheral nerves and muscles. Therefore the question arises how an agent's (degree of) autonomy is affected if the BCI mediates the relation between the mind and the external world.

WHAT DID THE RESEARCHERS DO?

We analyzed the impact of BCIs in terms of three abilities that are often constitutive of autonomy in humans:

- (1) To use information and knowledge to produce reason(s)
- (2) To ensure intended actions are effectively realized
- (3) To enact intentions within concrete relationships and contexts.



WHAT DID THE RESEARCHERS FIND?

To the extent that a BCI device has more control over decision-making than the user, autonomy seems to be at risk. Other negative effects could arise due to lack of integration of situational factors during action guidance in BCIs, or, for example, due to ignorance of situational feedback (e.g. the machine's ignorance of emotions). We should also consider the BCIs impact on the user's reasoning, in addition to action.

WHAT NOW?

Many have considered the positive potential effects of BCIs on human autonomy, via the extension of the user's will, or the ability to interact with the world. But BCIs also have the potential to negatively impact human autonomy. The scientific and ethical community must attend to tradeoffs involved in this technology and its various applications.

