Hamilton Institute

Translating Thoughts into Actions by Finding Patterns in Brainwaves

An E.T.S. Walton Lecture

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The Royal Irish Academy, Dublin

Weak electrical signals generated by the brain were first observed on the scalp in the early 20th century. By the middle of the 20th century, patterns in brainwaves were found that are associated with movements, some actually preceding the movement. The finding that similar patterns occur with imagined movement has motivated recent efforts to translate these patterns into signals for controlling a wheelchair or a prosthetic arm. This could provide a paralyzed person some control of their environment and restore the ability to communicate for someone who has lost all voluntary muscle control. Recent work has carried the search for brainwave patterns beyond imagined movements to mental tasks, such as multiplication, counting, and music recall. The objective of this line of research is a practical "brain-computer interface", preliminary examples of which will be discussed.

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