

## THE INVENTION

A Brain Computer Interface (BCI) system is a communication system where a person has the ability to communicate with a computer through his or her brain signals rather than using the peripheral nerves and muscles. A BCI system effectively allows for the conversion of patterns of electrical brain activity into commands to control specific equipment.

The WALNUT project is an example of how a BCI could be used to control a music-player app. The user wears a headband with 2 electrodes in contact with the back of the head and by simply looking at the icon of interest, can select and control the music as one would by pressing buttons.

## NOVELTY

The technology allows the user to select a particular command simply by focusing their attention on the targeted stimulus for a very short period of time. A specific pattern of brain activity related to that stimulus is then automatically identified by the BCI and instantaneously translated into a signal to activate the corresponding music player command. This enables the user to select their options without having to lift a finger!

WALNUT works in asynchronous mode, giving the user total control of the application as commands can be issued at one's own free will, rather than at specific time instants as in cue-based systems. It can also distinguish between an intended and un-intended control signal known as idle state. As the device only requires 2 EEG channels, it is quick and easy to set up.

The software behind WALNUT serves as a platform, which can be easily integrated with any software application as output can be changed to any menu of options.

## APPLICATION FIELDS

This is your second pair of hands.

WALNUT is particularly suited for runners, cyclists, sportspeople and other individuals who up to now have had to interrupt the pace of their activity to modify the music they are listening to. The technology behind WALNUT can also be applied to a number of areas including:

- Healthcare sector: can be applied to those who suffer from locked in syndrome as well as other areas where the patient would require a hands free control
- Gaming industry
- User-based augmented reality for applications such as Pokemon Go, Snapchat
- Enterprise-focused augmented reality

*The development was executed at and supported by the University of Malta, sole owner of the rights. The university's IP is managed by its Knowledge Transfer Office. Inquiries shall be submitted to [knowledgetransfer@um.edu.mt](mailto:knowledgetransfer@um.edu.mt), or further information may be obtained on +356 2340 3466.*

## IP STATUS

The intellectual property is protected by copyright.

## COMMERCIAL INTEREST

We are looking for potential collaborators to develop the technology further, particularly with respect to hardware in the form of a stylish headset. We are also interested in hearing from researchers or companies who would like to adapt the system for their specific application.

## LEAD INVENTOR



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