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Editorial OMICS International

Ergonomics Aspects in BCI Devices

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Editorial

Devices Known as Brain Computer Interfaces (BCI) [1] are compact devices designed for the measurement of Electroencephalography Signals (EEG). They have generally the shape of a headset or head band. The BCI inherit the EEG technology used in the medical or research field but simplified, with fewer electrodes that make them more practical to use and less expensive, although they obviously provide less rich or precise information. They are aimed at the consumer market and are usually used for subjects related to meditation, relaxation or video games. On the other hand, they have a great potential of applicability in other areas, such as interface for people with disabilities such as wheelchair control [2] or rehabilitation [3] sometimes related with other advanced technology such robotics [4].

Since these devices only act by measuring very low energy signals, they do not pose an electrical risk to the user as long as they are used in accordance with the manufacturer's recommendations, especially with regard to the energy recharging process (not using it in the bathtub, for example).

The manufacturer must manufacture these devices complying with the regulations of electromagnetic compatibility and, as regards the usability and ergonomics of the product, the manufacturer must take into account the anthropometric measures [5] and the standards of ergonomics (ISO 9241). For anthropometric measures, the circumference, width and length of the head, and the width between ears will be necessary in this case. Some researchers [6] propose 3D anthropometry measures for their design.

Its continuous use does not impose a load on the user from the point of view of its operation, but it can be done by the mere fact of wearing it because of the pressure exerted on the head, ears and hair. However, when these devices are used as interaction devices, it is in these areas where load can be present on the user and it is here that the ergonomic study of such interaction must be carried out [7].

Although usually dry type electrodes are used, some are wet type and require the use of saline solutions, similar to those used for the use of contact lenses, which may present hypersensitivity problems but in very few cases.

Since it can be an interaction device it must follow the design principles in HCI [8], such as: Not violate user expectation, consistent design, reduce user memory load, and provide feedback to user, valid for different users and that its manipulation is direct and simple.

These devices are part of the set of emerging technologies that are in the growing part of the expectation of development and implantation in the market [9], so that manufacturers, designers and specialists in ergonomics will introduce the most appropriate specific requirements. This is a relatively new field in progress bad some researchers have begun performing intensive experimental studies to provide light to the subject [10] and proposing new methodologies [11].

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