# Brain Computer Interfaces

You may be using a keyboard and a mouse right now to access your computer, but there are many other interface options and methodologies out there being worked on. Lots of people are doing research into the field of brain-computer interfaces that work by directly linking together an external device with a human or animal brain. A brain-computer interface (BCI) can theoretically work through either a one way or a two way process, but two way interfaces have not yet been successfully implemented. The one way interfaces that do exist may allow a computer to send signals to a brain, or alternatively they may be set up to receive commands from the brain and turn them into digital signals. These interfaces may be one way in the future that allow people from different cultural backgrounds to interface with computers on equal terms. The first research into this field began in the 1970's but wasn't used with humans in any practical sense until the mid 1990's. The interface implants that now exist are designed to restore a particular function of the human brain that is not working as it should. This restoration may include the facilities of hearing, sight or movement, however this scope could increase in the future. With recent discoveries made and no doubt future discoveries to be made soon, brain-computer interfaces could potentially be designed to improve our natural human functions as well as restoring them. This will certainly make for lots of interesting ethical discussions and dilemmas in the near future. {mosgoogle center} Research working with brain-computer interfaces in humans can be either invasive, semi-invasive or non invasive in nature. Invasive interfaces are implanted directly into the brain of a person and are generally used to repair damaged facilities of sight or to provide extra functionality to a paralysis patient. As well as these functions, brain-computer interface implants have also been used to allow someone to control an artificial robotic hand and even to move a computer cursor. Semi or partially-invasive interfaces are put inside the head but not within the actual brain of the patient.

Non-invasive brain-computer interfaces record brain signals through a neuroimaging procedure. Electoencephalography (EEG) is the most well known non-invasive interface which has been used as everything from a way of giving limited hand movement back to quadriplegic patients to acting as an interface for people to express musical ideas. Indeed the future of brain-computer interfaces will not only lie with the helping of the sick and disabled, but will equally be used to provide all people with a powerful way of doing anything on a computer at all. One good example of this is the software product 'mindball' which allows a user to control the movement of a virtual ball by learning to manipulate the EEG content coming from their brains. This trains the user to be focused and relaxed and may even have some future uses in the fields of meditation and education. This way of training someone to use a computer is totally unspecific to culture as it works with very basic functions of brain control. Brain-computer interfaces are still in their infancy as research continues into both brain functioning and the ways to map it effectively to electronic data. Ethical considerations will no doubt have an impact on the future of this field, as will cultural considerations and questions regarding the way language is controlled in the brain. Today its main use is in helping those with disabilities to function more fully, and through this we will hopefully learn more about how to use our brain as an effective interface for the future.