

Human Activity Recognition

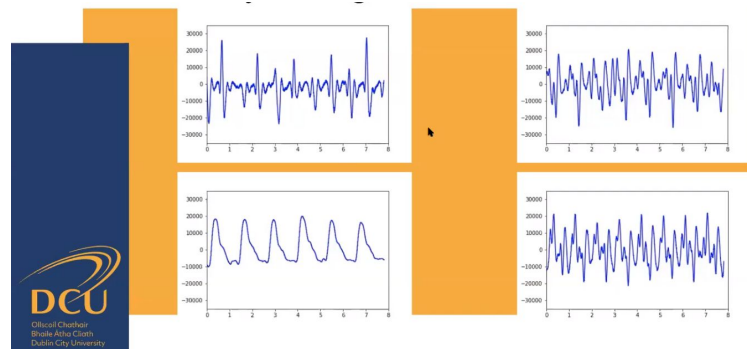
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Dr Tomas Ward talked to us via a video presentation about Human Activity Recognition in wearables and the challenges faced in this area. Dr Ward is our lecture in DCU and also the AIB Chair of Data Analytics at the School of Computing in DCU. He also does a lot of work with the Insight Research Centre for Data Analytics.

Monitoring Human Activity

This can be achieved easily with wearables such as Fitbits and smartwatches for example. These wearables have an optical sensor which gives out light and measures how much light is reflected back. This can then show a person's heart rate.

The issue with these is that everyday use of the device can cause interference. For example, moving your wrist a lot will cause the wearable device and its sensor to move around a lot, lowering the accuracy of the data received.

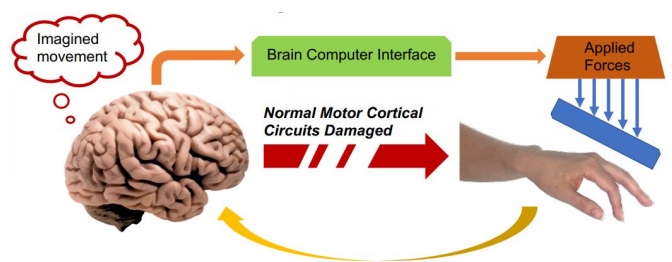


The solution to this is Machine Learning and Data Analytics. Through this, we can identify patterns within the data and improve the data's accuracy and improve our understanding of the data, for example, whether a person is walking, running or at rest.

Stroke Rehabilitation

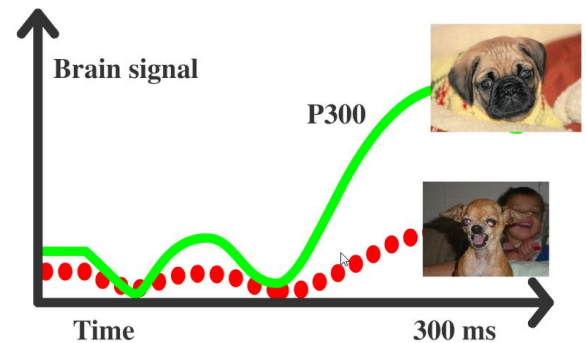
People who have suffered from a stroke end up with an immense difficulty with their motor skills, so Dr Ward along with some researchers came up with the idea to bypass the brain and instead use a computer interface to control different parts of a person's body.

A person would just have to think of moving and the computer would recognize this and act accordingly. This is extremely useful in stroke rehabilitation and allowing people to use their body's to their full potential again.



P300

P300 is the name of a specific brainwave that occurs in response to a person spotting a target among a set of distracting stimuli. This has many uses and is very beneficial in attention training. An example Dr Ward used was a game where a person would be shown different images and have to “spot the pug”. Whenever a person saw a pug, their P300 brainwave spiked, so how quickly they do this can be measured. With Machine Learning, we can automate brain signal extraction and in this instance specifically the P300 brainwave which can be then used to create specific training to enhance a person’s P300, effectively training and improving their attention.



Final Thoughts

Overall I found Dr Ward’s presentation very interesting, the topic of stroke rehabilitation, and how this can be done with neural interfaces and machine learning, fascinated me. I think this is really important research and the benefits of this at present and in the future are very clear and I’m sure this technology will improve people’s lives greatly.