Artificial Intelligence

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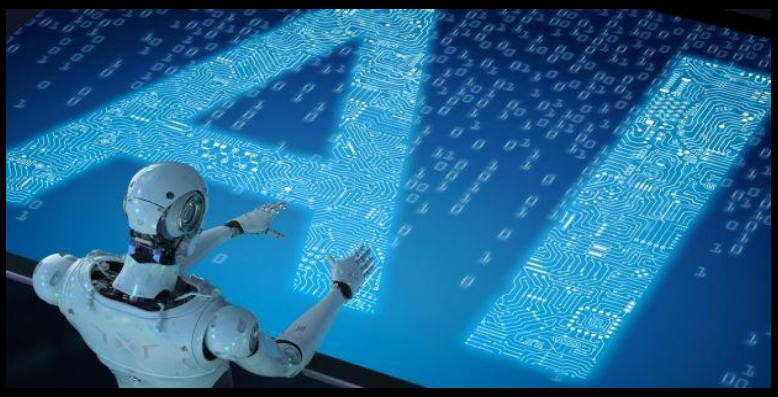
In this blog I will discuss how Data and Artificial Intelligence (AI) create insight and cause innovation

Innovation



The aim of innovation with regards to artificial intelligence is to improve how we live, work, perform and how we make decisions. Development of artificial intelligence and machine learning can help us in the tracking of human health and fitness. Ultimately, we want these developments to be applied to the real world.

AI and Big Data are used to see patterns and learn relationships between our behaviour and physiology (how we move and interact with our environment) and enables us to gain a picture of how things are.

A lot of data used comes from wearables. These wearables come in the form of Implantables, Head-Mounted Displays (HMDs), Smart watches and even Smart Shirts.

A real-world example of these wearables is the Fitbit. This Smartwatch is designed to track important health and activity

markers, including heart rate, quality of sleep and the number of steps walked.

AI and sensors

AI is now used when working with stroke patients. According to the Health, Safety and Environment Management (HSE), a stroke is a serious medical condition that occurs when the blood supply to part of the brain is cut off. After a stroke you can lose the ability to move your limbs, so u lose ability to move one of your hands. You want to move your hand but just you can't.

A brain Computer Interface was created where the patient thinks about moving their hand and the signals to the brain are measured and the damaged nerves are bypassed. A little haptic system that moves the persons hand is applied and as a result they can engage in rehabilitation.

Scientific Challenges

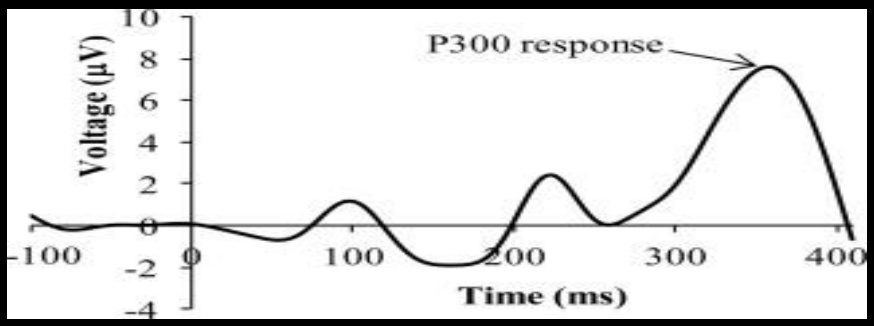
We can. scientifically demonstrate utility of wearable sensing & machine learning in tracking of:

- Cognitive function
- Everyday activities
- Neurological conditions
- Decision making

Cognitive Function

The “P300” is a name for a specific brainwave that occurs in response to you spotting a target among a set of distracting stimuli. In trying to study this brainwave, an experiment was set up in which the subject is given a task. This task consisted of the subject being showed a series of pictures and is asked to find one a picture of a specific object. So, for example the subject is showed various pictures of bagels and is asked to find a doughnut. When the subject sees the picture of the doughnut, subconsciously the P300 brainwave is activated. It is higher that all the other signals when the subject looks at the bagels.

This P300 brainwave is now used in improving and predicting human memory performance. With the use of AI and machine learning we can now train people to remember stuff better.



Everyday activities

With the Fitbit mentioned before, there are some problems when it comes to people using them when they aren't being physically observed. Some people with medical conditions are asked to wear these Fitbits so doctors can observe how patients move and interact at home. The problem with this is some patients tend to strap the Fitbit to their dog or even give it to a friend. This messes up the information on the patient and therefore lengthens their treatment.

Confusion Matrix is a performance measurement for machine learning classification. With the use of machine learning, computers can now decipher between different peoples movement and day-to-day interaction.

Neurological Conditions

New-born babies can't tell you anything. You can't know if they are having a seizure as there is no set movement or pattern when this happens.

With the use of machine learning we can measure brain activity. Because brain waves change when you hare having a seizure, we can

now see when a baby is having a seizure and ensure the right procedures are implemented.

Conclusion

We have been using machine learning for improving health and human performance for some time

- The newest ideas in AI have had transformative impact on what we do
- Together with internet of things technology, data analytics and sensor science, it will continue to improve our lives
- All other implications stem from human choice and intention

By Nicolas Oyeleye