This is your brain on software

NTU-developed 3D imaging tool can give insights on how the human mind works

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THE age-old mysteries of why men don’t stop to ask for directions and why women cry at movies could soon be solved by new breakthrough technology.

Showing images of human brain activity in three-dimension and living colour, a software developed by Nanyang Technological University (NTU) is paving the way for an even deeper understanding of the brain.

It could prove a critical breakthrough in the study and understanding of disorders such as epilepsy and Alzheimer’s disease — and shed light on why a child listening to a Mozart CD while he studies for a test might actually do better than one who mugs to the sound of Britney Spears.

The software translates, within minutes, data from the standard test that measures brain activity — the electroencephalogram (EEG) — into a three-dimensional visualisation (picture).

The software, which took NTU researchers three years to develop, then processes the information, revealing additional data that cannot be determined from conventional EEG data.

This means that doctors can now "see" brain activity. From this, they are now able to predict changes that forecast neurological events such as epileptic seizures — something that cannot be done with current two-dimensional data.

Apart from clinical applications such as improving diagnostic capabilities of neurological illnesses, the technology can also be used to study brain behaviour. According to the research team’s project leader, Associate Professor Vladimir Kulish, initial studies on emotion and smell have revealed interesting findings — such as reinforcing the belief that men and women use different parts of the brain for similar activities, such as smelling.

Other studies also showed that people tend to display higher levels of stress and longer periods of brain activity when they answered "no", to a series of "yes" and "no" questions.

The brains of those with music training responded differently to various types of music, compared to those with no prior training. And classical music, especially by Mozart, appeared to stimulate learning centres in students’ brains better than any other music.

Brain activity aside, the NTU software can also be used to analyse any kind of data collected over time, such as temperature fluctuations or share-market trends, and generate greater depth of information that cannot be obtained from conventional methods, added Prof Kulish.

The team will present its research to doctors at a National Neuroscience Institute seminar next week. They are hoping to find medical partners to work with in their next phase of clinical trials, to study how it will benefit patients.