

## New Technology to Help Treat Mental Health Problems

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1 in 4 people in the United Kingdom will suffer from a mental health problem throughout their lifetime, 250,000 people in the UK will be admitted into a psychiatric ward every year. Mental health problems are not only debilitating for the sufferer but affect those around them as well. The issue of mental health is an increasing problem for society in particular depression has become prevalent. Depression can lead to addictive behaviour (e.g. drugs and alcohol) and in some cases suicidal thoughts. The Pervasive Technology Lab is a non-profit organisation created to research into the use of new technology to help people with medical problems and in particular those with mental health problems. Technologies such as Virtual Reality have been successfully used to treat mental health problems.

Virtual Reality (VR) (computer simulated environments) and Augmented Reality (AR) systems (graphically annotated digital environments) have been used to treat mental health problems such as Post-Traumatic Stress Disorder (PTSD) often suffered by soldiers returning back from conflict (leading to depression and physical hyper arousal) and phobias such as a fear of flying or spiders. The success of virtual environments in the treatment of such mental health problems has been largely due to providing a sense of realism in a safe environment. The patient can then be habituated to the cause of the problem such as flight simulation and they would therefore be exposed to the stimuli to such an extent that it no longer causes them a problem.

The Pervasive Technology Lab are looking into among other issues the use of Augmented Reality to treat the mental health problem of depression. In collaboration with a leading Mental Health charity in the UK, an AR system has been developed to help treat depression. With discussions with counsellors at Milton Keynes Mind at Farthing House it is regarded that depression can be caused when an individual's needs are not met, this can lead the person to react emotionally, such as feeling low mood, if they experience low mood then they are unlikely to gain full sleep. Their mood when the sufferer has no sleep then deteriorates even further and a cycle is created where emotion overrides rational thinking and the patient's health gets worse. It is therefore important for the patient to relax in order to get sleep and lift them out of depression. Techniques to counteract the negative thoughts can then be used such as positive thinking and exercise (which releases Serotonin into the brain relaxing it).

A system developed by the Pervasive Technology Lab (CIC) uses neuro-feedback. EEG (brain waves) data is then used to ascertain the patient's relaxation level, the floating ball moves up if the mind is active and remains static if they are relaxed (i.e. little brain activity). By providing a graphical

representation of their brain activity through a novel means (i.e. AR) it is hoped that the patient motivation levels for using the system is high and they gain rich visual feedback on the success of their relaxation. It is envisaged that after continued use of the system, patient's ability to relax at any moment in time will be improved as they have learned when they have successfully managed to relax through the visual representation of the virtual ball within the AR system.

Other possible developments include the use of 'serious games' to teach people how to cope with depression in an 'fun' manner. Serious games are increasingly being used by industry to teach people information in an entertaining manner, such as areas like auditing. TruSim part of Blitz games are creating a game to teach nurses how to tackle the life threatening MRSA bug found in hospitals. The Pervasive Technology lab are exploring various methods of applying cutting edge technology to medical health problems such as advanced mobile technology and Personal Digital Assistants (PDAs). If you would like to contribute in anyway please e-mail [info@pervasive-technology-lab.org](mailto:info@pervasive-technology-lab.org) and please visit the website for further information: <http://www.pervasive-technology-lab.org>.