AN AI WITH EMPATHY?

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Welcome to the 4th instalment of this series discussing AI in the field of health care. We have looked at how we are using AI to help carry out administration work in hospitals, for example, or to help professionals in analysing medical images. We have also looked at the introduction of Virtual Reality as a tool to help both caregivers and care receivers alike. In this article, we would like to introduce another concept related to AI that promises to help further provide added-value healthcare to patients. This concept is called Affective Computing.

Affective Computing was formally introduced to the world in 1997 by Rosalind Picard, Professor of Media Arts and Sciences at the Massachusetts Institute of Technology.[1] In the field of AI, the main goal has always been that of having machines perform human-like tasks, and to a certain extent, the area of AI has gone a long way in achieving this. However, most of the AI already implemented lacks one fundamental human ability: the ability to detect, and understand human emotion. More importantly, most of the existing AI cannot change its behaviour according to human behaviour. If we can make that missing step in giving our machines the ultimate human-like ability, and find suitable applications for it in the area of healthcare, then Affective Computing promises to be a real game-changer.

Researchers have already started looking at how and where to introduce Affective Computing for patient care. A significant part of the world's population is affected by depression, stress and anxiety-related disorders, which are interdependent and directly connected to emotion.[2] Affective systems have successfully been used in mental health interventions or as diagnostic and treatment tools for depression and numerous anxiety-related disorders. Let us give an example. In previous articles, we discussed the adoption of chatbots to help patients with various conditions. What if these chatbots could understand how the patient is feeling while conducting the conversation? What if the AI could detect if a person is showing signs of depression and change its behaviour accordingly to ease the problem before alerting the competent professionals?

Having presented the concept of Affective Computing, we would like to introduce Morpheus. Morpheus is a project undertaken by researchers at the University of Malta that brings together the various concepts we have discussed in this series, from AI to Virtual Reality to Affective Computing. Morpheus, a project funded by the Vodafone Foundation, is about helping young children receiving chemotherapy treatment through distraction therapy. Pain associated with chemotherapy is reduced by analgesics, which can however have adverse effects such as drowsiness, constipation and other gastrointestinal distress. Morpheus promises to provide a safe and effective method of reducing the pain associated with chemotherapy. Through the use of a virtual reality game, we aim to distract children during chemotherapy to reduce the pain which patients experience. Previous articles highlighted the work being carried out by KindVR in the area. However, through the introduction of Affective Computing, we are promising to provide something completely innovative. The virtual reality game will collect physiological data from the child playing the game. It will adapt its experience in real-time to keep the player engaged with what is happening inside the game. The more the patient is involved with the game, the fewer pain symptoms are recorded by receptors in the brain, making the overall experience better.

We are currently on course to complete the first of three iterations of Morpheus and the initial results are indeed promising. We are confident that the approach we are taking will in turn return positive results when the game is eventually deployed for use in hospital wards locally. The introduction of Affective Computing has afforded us the opportunity to make AI something that humans can truly relate with, and its application in the area of healthcare provides researchers, professionals, and patients with opportunities few could have imagined possible a couple of years back.

REFERENCES
1. Picard, R. Affective computing. Cambridge, MA: MIT Press; 1997
2. World Health Organization. Depression: Fact sheet, Updated March 2018 [Online]. Available at: http://www.who.int/mediacentre/factsheets/fs369/en/