

On the Application of Remote Healthcare Strategy in Treating Autistic Children at Home

Koushik Maharatna

School of Electronics and Computer Science, University of Southampton, UK

E-mail: km3@ecs.soton.ac.uk

Abstract. Remote healthcare strategies enabled by advances in apparently diverse disciplines of Information and Communication Technology (ICT) have gained significant research attentions in the recent time. Miniaturised sensors and enormous processing power offered by the modern computing devices allows one to capture plethora of physiological and environmental signals and subsequent analysis to unearth new knowledge that may one day be translated into real clinical practice to offer novel services to the society like proactive diagnosis and effective rehabilitation. To date most efforts in applying remote healthcare technology concentrated in the domain of Cardiovascular diseases (CVD) and Stroke rehabilitation although more and more efforts are currently underway in its application in neurodegenerative diseases. In this context, the present talk will give an overview on how such technology could be applied in treating autism – a lifelong debilitating condition that sets at the early childhood incurring enormous socio-economic cost to the society. Two main aspects have been identified by researchers over the years regarding treating autistic children: 1) early diagnosis and, 2) delivering effective intervention.

It has been proved that if autism could be diagnosed at an early age (around 18 month) then by deploying child-centric intensive behavioural intervention it may be possible to mitigate significant abnormalities of autism. However it has also been recognised that diagnosis through state-of-the-art behavioural observation may not always lead to correct diagnosis especially at such an early age. On the other hand it has also been shown that to make significant behavioural changes intensive intervention for about 25 hrs/week is necessary. Such level of intervention is very much unlikely to be achievable in clinics only due to the load on therapists and its associated cost factor. This talk will try to describe a nomadic framework under which both of these key issues of treating autistic children may be addressed using amalgamating remote EEG acquisition in task- and person-specific way with serious gaming strategy deployed at home. The main work described in this talk has been originated from EU FP7 funded project MICHELANGELO and here we will show some preliminary results which may be translated into future clinical practice for treating autism.