
The role of Information and Communication Technologies (ICTs) in the assessment and treatment of neurodegenerative disorders

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Résumé

In the last decade, there has been a growing interest in employing information and communication technologies (ICTs) with people living with neurodegenerative disorders (ND) such as Alzheimer’s disease (Robert et al., 2016). Beyond helping people with ND in their everyday life (Assistive Technologies), ICTs have proven to be important: a) to improve the patient clinical assessment, by allowing the development of new methods to evaluate more objectively behavioral and functional deficits; and b) to offer new non-pharmacological solutions to improve patients’ treatment, stimulation, and rehabilitation. This is the underlying idea for the development of Serious Games, which are digital applications employing video-game scenarios for purposes other than entertaining, such as training and educating, informing, communicating, or enhancing user’s aptitudes or cognitive/physical functions. In the context of the UCAJedi IDEX project MNC3 (Médecine Numérique: Cerveau Cognition Comportement), we will explore the interest of combining data coming from ICT sensors with neuroimaging, clinical and genetic data to improve the diagnosis, treatment and follow-up of people with neurological and neuropsychiatric diseases.

In this talk we will describe recent research projects in the domain of ICTs developed by the CoBTeK lab (Cognition-Behavior-Technology)[1] of the Université Côte d’Azur (France), born from the collaboration between INRIA STARS team and the Nice Memory Center at Nice University Hospital (CMRR, CHU). Several works developed by this multidisciplinary team in the context of European (FP7, H2020) and French (ANR) research project confirmed that:

- a) Actigraphy, automated video and audio analysis techniques and computerized testing represent promising new tools to improve the functional and cognitive assessment of patients with ND, by allowing a more objective, ecological and cost-effective evaluation of motor, behavioral and cognitive deficits (see Konig et al., 2015)
- b) Serious Games and Virtual Reality can offer interesting non-pharmacological options for patient’s stimulation, in order to train their cognitive and physical functions, improve mood and reduce apathy (see Manera et al., in press).

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We will finally outline the interest, implications and the challenges of combining these ICT-based data with heterogeneous information coming from the clinical, neuroimaging, and genetic domains.

References

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