J Inform Tech Softw Eng 2016, 6:4(Suppl)
http://dx.doi.org/10.4172/2165-7866.C1.006

Sensorially-enhanced media: One size fits all?

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Recent studies encourage the development of sensorially-enriched media to enhance the user experience by stimulating senses other than sight and hearing. Sensory effects have been found to favour media enjoyment and to have a positive influence on the sense of Presence and on the perceived quality, relevance and reality of a multimedia experience. Sports is among the genres that could benefit the most from these solutions. However, scientific evidence on the impact of human factors on the user experience with multi-sensorial media is insufficient and sometimes, contradictory. Furthermore, the associated implications, as regards to the potential adoption of these technologies, have been widely ignored. In this talk I will present the results of an experimental study analysing the impact of binaural audio and sensory (light and olfactory) effects on the sports (football) media experience. We consider the impact on the quality and Presence dimensions, both at the overall level (average effect) and as a function of users' characteristics (heterogeneous effects). Along the quality dimension, we look for possible variations on the quality scores assigned to the overall media experience and to the media components content, image, audio and sensory effects. The potential impact on Presence is analyzed in terms of Spatial Presence and Engagement. The users' characteristics considered encompass personal affective, cognitive and behavioral attributes. In this talk I will: i) present our experimental study and its outcomes; ii) discuss and contextualize our results; and, iii) highlight open issues, research challenges and specific hypotheses for future research.

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Speech systems to help persons suffering from a communication disorder

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Communication is a multidimensional dynamic process that is necessary to express thoughts, emotions and needs. If one or more function involved in the communication process is impaired, the communication is disordered. A communication disorder has a large impact on the life quality; it reduces the capacity to express personality, exercise autonomy and often has an impact on relationships and self-esteem. Therefore, it is important to enhance the communication quality of individuals suffering from a verbal communication disability by offering them more possibilities to interact with their environment. Our research focuses on one of the most common speech communication disorders associated with a neurological impairment called dysarthria. In fact, millions of children and adults suffer from acquired or congenital neuro-motor communication disorders that can affect their speech intelligibility. The automatically characterization of speech impairment can contribute to improve the patient's life quality, and assist experts in assessment and treatment design. First, an original dysarthric speaker recognition system is proposed in a context where the individuals affected by verbal communication disorders are excluded from speech-enabled biometric solutions. Second, new approaches are implemented to improve the effectiveness of automatic diagnosis and assessment of the dysarthria severity levels. For this purpose, different levels of speech parameters were used, among them; computational models of auditory perceptual knowledge are proposed. Data are from two important world-class databases of speech disorder, namely, Nemours and Torgo. Presented systems were developed using standard methods of machine learning and discriminant analysis. The results are promising for the proposed ASR system even though their preliminary nature; it can be used by patients to better communicate in a world where the importance of biometrics is growing. Also the algorithms of dysarthria assessment can be useful for therapists. The objective assessment, independent of the therapist may change the way of working with the patient.

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