

# Virtual exercises to promote cognitive recovery in stroke patients: the comparison between head mounted displays versus screen exposure methods

P Gamito<sup>1</sup>, J Oliveira<sup>1</sup>, N Santos<sup>2</sup>, J Pacheco<sup>2</sup>, D Morais<sup>1</sup>, T Saraiva<sup>1</sup>,  
F Soares<sup>1</sup>, C SottoMayor<sup>1</sup>, A F Barata<sup>1</sup>

<sup>1</sup>CEPCA/ULHT,  
Campo Grande, 376, 1749-024 Lisbon, PORTUGAL

<sup>2</sup>Alcoitão Hospital,  
Rua Conde barão - Alcoitão 2649-506 Alcabideche, PORTUGAL

*pedro.gamito@gmail.com, jorge.oliveira@ulusofona.pt, nunobarrossantos@gmail.com,  
jose.pacheco@cmra.scml.pt, diogo.morais@ulusofona.pt, tomaz.saraiva@gmail.com,  
fbsoares7@gmail.com, catarinasottomayor@gmail.com, a.filipa.barata@gmail.com*

<sup>1</sup>*labpsicom.ulusofona.pt*

## ABSTRACT

Stroke can be considered as a major cause of death and the consequences are associated with different syndromes of the impaired physical, cognitive, behavioral and emotional domains. The cognitive rehabilitation is often related to improvement on executive functioning through repeated and systematic training in memory and attention exercises, in which virtual reality has proven to be a valid approach. Several devices have been used as visual outputs. Head mounted displays (HMD) and desktop screens displays are amongst them. HMD is usually perceived as being more immersive than screens. However, it presents several shortcomings if a widespread use is the objective. In this way, this study aims at assessing the prospect of opting for screen displays as an alternative to HMD within virtual reality (VR) based applications to rehabilitate memory and attention impairments in stroke patients. A sample of 17 patients with memory and attention deficits resulting from stroke were recruited from the hospital *Centro de Medicina da Reabilitação do Alcoitão*. The patients were randomly assigned to two different groups: (1) HMD based VR; and (2) desktop screen based VR. The patients in the experimental groups underwent a virtual reality (VR) training programme with 12 sessions regarding memory and attention exercises. These patients were assessed before and after the VR training sessions with the Wechsler Memory Scale for memory and the Toulouse Pieron for attention functioning. The results showed increased working memory and sustained attention from initial to final assessment regardless of the VR device used. These data may suggest better functional independence following VR-based intervention and support the use of non-expensive displays as an alternative to high-end setups commonly used in VR applications devised for rehabilitation purposes.

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**Full papers will be published in the Conference Proceedings and will be available to delegates at the conference on Sept. 10.**

**Full papers will be released on-line in the ICDVRAT archive on March 15.**