

Sirius : A VR serious game for neck stretching exercise

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Neck pain is a common but severe medical condition¹, and one of its leading causes, forward head posture (FHP), has been reported to be much more frequent in recent years due to the increasing use of smartphones and computers^{2,3}. Various home stretching exercises are known to be effective in improving neck pain and forward head posture⁴, but the boredom of repetitive movements often makes the patient less motivated to exercise alone regularly⁵. The purpose of this study is to add excitement to tedious neck stretching exercise through serious game design using virtual reality (VR) technology.

'Sirius' is a realistic, HMD (head-mounted display) based immersive VR adventure game implemented in this study. The game system presents an exergame mechanic design that converts two types of structured stretching movements into each virtual game function which seamlessly guides the user to periodically stretch his/her neck with natural interaction while playing the entire game. Unlike the other rehabilitation games that did not make induce player's interest by repeating certain actions only, Sirius was designed to create a proper storytelling and immersive 3D environment so players could naturally immerse themselves in the game. This study focused on reducing the perceived repetition in rehabilitative actions by designing the mechanics of neck stretching as an essential but supplementary resource-managing game mechanic rather than the main mechanics of the gameplay. Also we discuss the applicability of the neck stretching game mechanics designed in this study to other HMD based games and the user study design as future work.

Acknowledgement

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