

Visual and optometric issues with smart glasses in Industry 4.0 working environment

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ABSTRACT

Smart glasses are a kind of Head Mounted Display (HMD) with great potential in Industry 4.0 working environments, where shop floor workers must be supplied with critical information in a timely, accessible and safe manner to be as productive as possible. Smart glasses collect data from a wireless network and project it on a tiny screen before the user's eye. Despite several benefits, such as hands-free access to computer-generated info, routing to storage locations, eliminating the need to carry handheld scanners or written documents, there are also possible problems evidenced from the literature. HMD can cause headaches, pressure in the eyes, problems with focusing and difficulties with text reading. To study the addressed problems, a research was performed together with Ophthalmologists from Maribor Healthcare Centre. The effects of using Vuzix M300 Smart glasses on users' comfort during order picking activities were researched in a testing warehouse environment at the Faculty of Mechanical Engineering, Maribor. The testing period lasts four hours. Several ophthalmologic tests (visual acuity, contrast sensitivity, visual field testing and colour test) were performed before and after use of smart glasses. Results show that there are some statistically significant differences before and after use of smart glasses in users' visual acuity and, surprisingly, a high percentage of scotomas in the right eye (where the projection of smart glasses was performed) after use of smart glasses that cannot be overlooked.

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