Mobile Augmented Reality for Collaboration in Operation

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Abstract : Mobile augmented reality (MAR) tracking targets from the surroundings and aids operators for interactive data and procedures visualization, potential equipment and system understandably. Operators remotely communicate and coordinate with each other for the continuous tasks, information and data exchange between control room and work-site. In the routine work, distributed control system (DCS) monitoring and work-site manipulation require operators interact in real-time manners. The critical question is the improvement of user experience in cooperative works through applying Augmented Reality in the traditional industrial field. The purpose of this exploratory study is to find the cognitive model for the multiple task performance by MAR. In particular, the focus will be on the comparison between different tasks and environment factors which influence information processing. Three experiments use interface and interaction design, the content of start-up, maintenance and stop embedded in the mobile application. With the evaluation criteria of time demands and human errors, and analysis of the mental process and the behavior action during the multiple tasks, heuristic evaluation was used to find the operators performance with different situation factors, and record the information processing in recognition, interpretation, judgment and reasoning. The research will find the functional properties of MAR and constrain the development of the cognitive model. Conclusions can be drawn that suggest MAR is easy to use and useful for operators in the remote collaborative works.

Keywords : mobile augmented reality, remote collaboration, user experience, cognition model

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