

# General Software Platform for Assembly and Maintenance Task Based on Augmented Reality

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Abstract :

Augmented reality (AR) support systems have been proven to be effective in supporting various tasks but have not been widely used in real-world applications due to their high development costs and requirements for multiple skills. Several low-code or no-code AR authoring tools for content development have been proposed to solve this problem. However, most AR systems developed using these tools are not well compatible with industrial environments and task types, which means that the system adaptability of the program is insufficient. In addition, the visualization method of the system interaction interface and content is not flexible enough to fully support end users to use the program more freely in the task, and it cannot provide sufficient task content and cognitive information assistance. Thereby limiting the quality of task and reducing user experience. In this study, firstly, in the development of AR authoring tools, the degree of freedom of the software platform and the visualization method of the content description format is expanded, and secondly, the design strategy of "environment, task and user-centered" is integrated into the design process of the software platform. This combined system solution aims to improve the adaptability of the AR system generated by the platform. In this paper, we mainly focus on expressing the proposed method in software platform development. The user study was conducted to evaluate the task performance including processing time and errors and the user experience including the perceived cognitive load and usability of our solution by comparing it with a conventional system. The results show that the proposed software platform could improve the compatibility with industrial environments and tasks, and reduce the workload and cognitive effort, although the task performance was the same as the conventional AR system.