Augmented Reality for Maintenance Operator for Problem Inspections

Authors : Chong-Yang Qiao, Teeravarunyou Sakol

Abstract : Current production-oriented factories need maintenance operators to work in shifts monitoring and inspecting complex systems and different equipment in the situation of mechanical breakdown. Augmented reality (AR) is an emerging technology that embeds data into the environment for situation awareness to help maintenance operators make decisions and solve problems. An application was designed to identify the problem of steam generators and inspection centrifugal pumps. The objective of this research was to find the best medium of AR and type of problem solving strategies among analogy, focal object method and mean-ends analysis. Two scenarios of inspecting leakage were temperature and vibration. Two experiments were used in usability evaluation and future innovation, which included decision-making process and problem-solving strategy. This study found that maintenance operators prefer build-in magnifier to zoom the components (55.6%), 3D exploded view to track the problem parts (50%), and line chart to find the alter data or information (61.1%). There is a significant difference in the use of analogy (44.4%), focal objects (38.9%) and mean-ends strategy (16.7%). The marked differences between maintainers and operators are of the application of a problem solving strategy. However, future work should explore multimedia information retrieval which supports maintenance operators for decision-making.

Keywords : augmented reality, situation awareness, decision-making, problem-solving

Conference Title : ICIHCI 2016 : International Conference on Interfaces and Human Computer Interaction

Conference Location : Kuala Lumpur, Malaysia

Conference Dates : August 18-19, 2016