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Using augmented reality devices for remote support in manufacturing: A case study and analysis

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ABSTRACT

Industry 4.0 forces increased digitization, production flexibility, improvement of employee competences and integration of employees and IT systems within an enterprise. To this end, state-of-the-art systems and IT solutions, such as the Virtual Reality (VR) and Augmented Reality (AR), are implemented. New systems must be integrated with the existing IT architecture, and their implementation forces the enterprise to provide network access with sufficient bandwidth to fully benefit from the capabilities of new technologies. The paper discusses the practical application of modern AR solutions in the industry, with a special focus on remote support for maintenance operations and training of production employees. Two experiments aimed determining the impact of various environmental conditions on the possibility of using the AR Remote Support are described. Basing on those experiments it is possible to determine the environmental conditions required to use HoloLens 2 AR goggles in two dedicated remote support applications.

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Izvirni znanstveni članek

Uporaba naprav za razširjeno resničnost za podporo na daljavo v proizvodnji: Študija primera in analiza

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POVZETEK

Industrija 4.0 v podjetja prinaša večjo digitalizacijo, fleksibilnost proizvodnje, izboljšanje kompetenc zaposlenih ter integracijo zaposlenih in IT sistemov. V ta namen podjetja vpeljujejo najsodobnejše sisteme in IT rešitve, kot sta navidezna resničnost (VR) in razširjena resničnost (AR). Novi sistemi morajo biti integrirani v obstoječo IT arhitekturo, njihova vpeljava pa od podjetij zahteva zagotovitev dostopa do omrežja z zadostno pasovno širino. Tako lahko podjetja v celoti izkoristijo zmogljivosti novih tehnologij. Prispevek obravnava praktično uporabo sodobnih AR rešitev v industriji, s posebnim poudarkom na podpori na daljavo namenjeni vzdrževanju in usposabljanju zaposlenih v proizvodnji. Opisana sta dva poskusa, namenjena ugotavljanju vpliva različnih okoljskih pogojev na možnost uporabe podpore na daljavo z AR. Na podlagi teh poskusov je mogoče določiti okoljske pogoje, potrebne za uporabo očal HoloLens 2 AR v dveh namenskih aplikacijah za oddaljeno podporo.

PODATKI O ČLANKU

Ključne besede:
Pametna proizvodnja;
Industrija 4.0;
Podpora na daljavo;
Razširjena resničnost (AR);
Navidezna resničnost;
HoloLens 2;
Šum okolice;
Omrežja Wi-Fi

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