

Implementation of Augmented Reality in the Context of Industry 4.0: A Comprehensive Review

Madiha Razaqat

1. Department of Industrial and Manufacturing Engineering
University of Engineering and Technology, Lahore
Lahore, 54890, Pakistan

College of Science

2. Princess Nourah Bint Abdulrahman University
Riyadh, Saudi Arabia
madiharazaqat@yahoo.com

Kashif Ishfaq

- Department of Industrial and Manufacturing Engineering
University of Engineering and Technology, Lahore
Lahore, 54890, Pakistan
kashifishfaq@gmail.com

Naveed Ahmed

1. Department of Industrial and Manufacturing Engineering
University of Engineering and Technology, Lahore
Lahore, 54890, Pakistan
2. Raytheon Chair for Systems Engineering
Advanced Manufacturing Institute
King Saud University
Riyadh, 11421, Saudi Arabia
naveed527@gmail.com

Abstract

Today's, especially the future's, industrial focus is seriously being shifted towards new industrial revolutionized concept termed as industry 4.0. Everything associated with the industry (e.g. production machines, tools, facilities, systems, operations, components, services, products and environments etc.) is assumed to be digital and smart. So far, the industry 4.0 concept has been laid on the nine pillars or the building blocks which include; 1) the industrial internet of things (IIoT), 2) cloud computing (CC), 3) big data (BD), 4) simulation, 5) augmented reality (AR), 6) additive manufacturing (AM), 7) horizontal and vertical systems integration, 8) autonomous robots, and 9) cyber security. Augmented reality (AR) is considered as the important pillar which has been filtered out to comprehensively review in this paper. In order to capture uniform data picture, numerous search engines are used to collect the published data within the period of recent five years (2015-2019). The concept of AR connects the real world to the easily modifiable virtual world. Various sectors of AR has been found in literature which are widely scattered in various domains. It has been found that the use of AR is either objective-specific or area-specific. The implementation of AR based on the industry 4.0 concept has been practiced in industry but not on a large scale. Regarding the future work, there is a need

of developing some standard procedures and guidelines which can be considered as common leading points for each and every domain of AR.

Keywords

Industry 4.0, Augmented Reality (AR), Product Design, Training, Manufacturing, Maintenance, Assembly.

Acknowledgements

The project was financially supported by Raytheon Chair for Systems Engineering, King Saud University, Saudi Arabia.

Biography / Biographies

Madiha Razaqat is a graduate student pursuing for MSc in Manufacturing Engineering from the Department of Industrial and Manufacturing Engineering, University of Engineering and Technology (UET) Lahore. She did BSc in Industrial and Manufacturing Engineering from the same university (UET) in 2011 and remained among top five students. She performed her duties as a lecturer for 5 years (2012-2016) in the College of Science, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia. In addition to teaching, she was also participating in research activities with the collaboration of King Saud University and published more than five research articles in well reputed ISI journals. Her present research interests include in the areas of: non-conventional machining, design for manufacturing assembly, synthesis of nano-particles and manufacturing systems.

Naveed Ahmed received BSc and MSc degrees in Industrial and Manufacturing Engineering from University of Engineering and Technology, Lahore – Pakistan. He joined the same university as a Lecturer in 2007. Dr. Naveed Ahmed received PhD degree from King Saud University, Saudi Arabia, in 2016 and received *King Saud University Award for Scientific Excellence* in 2017. Currently, Dr. Naveed is an Assistant Professor at the University of Engineering and Technology, Lahore-Pakistan. In addition to 25+ research articles published in well-known ISI impact factor publications, he has authored an international book and a book chapter as well. His major research interests are advanced manufacturing processes, micro/nano machining, manufacturing systems and design of production tooling.