

A Research Paper on Robotics

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Abstract: *This literature review presents a comprehensive analysis of the use and potential application scenarios of collaborative robots in the industrial working world, focusing on their impact on human work, safety, and health in the context of Industry 4.0. The aim is to provide a holistic evaluation of the employment of collaborative robots in the current and future working world, which is being increasingly driven by the automation and digitization of production processes, and which can be outlined using the term Work 4.0. In this context, the forms of work organization, and the demands and impacts on humans are changing profoundly. Collaborative robots represent a key technology to aid the transition. The review utilizes expert interviews for identifying relevant keywords, and follows the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) framework to evaluate peer-reviewed literature between 2002 and January 2022. The analysis includes forms of interaction, and the distribution of roles, control interfaces, safety procedures, and ergonomics and health. In addition, the review offers a heatmap displaying the research topics of 715 publications for each year, and a database of these publications in BibTeX format that is publicly accessible. The review highlights the challenges, potential benefits, and trends of using collaborative robots in the industrial working world, emphasizing the importance of a careful evaluation of their impact on human work, safety, and health. It offers a tool set for researchers and practitioners to further explore and evaluate the employment of collaborative robots in Work 4.0.*

Keywords: Human–Robot Collaboration; Human–Robot Interaction; Human–Robot Teaming; Work 4.0; Industry 4.0; cyber-physical systems; safety; health; ergonomics; flexible automation