

Model Based Optimization of Workplace Ergonomics by Workpiece and Resource Positioning

Authors : Edward Hage, Pieter Lietaert, Gabriel Abedrabbo

Abstract : Musculoskeletal disorders are an important category of work-related diseases. They are often caused by working in non-ergonomic postures and are preventable with proper workplace design, possibly including human-machine collaboration. This paper presents a methodology and a supporting software prototype to design a simple assembly cell with minimal ergonomic risk. The methodology helps to determine the optimal position and orientation of workpieces and workplace resources for specific operator assembly actions. The methodology is tested on an industrial use case: a collaborative robot (cobot) assisted assembly of a clamping device. It is shown that the automated methodology results in a workplace design with significantly reduced ergonomic risk to the operator compared to a manual design of the cell.

Keywords : ergonomics optimization, design for ergonomics, workplace design, pose generation

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