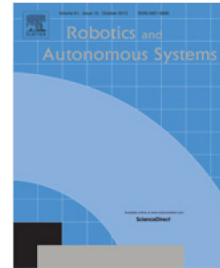


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Service Robotics and Human Labor: A first technology assessment of substitution and cooperation

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HIGHLIGHTS

- We discuss how service robots interact with human labor
- We identify different job segments that might come under pressure
- We describe how human-machine cooperation should be developed from a work science perspective
- We define first concluding criteria to assess service robots with respect to human labor

Keywords:

Service robots

Technology assessment

Aggregate production

Labor substitution

Labor complementarity

ABSTRACT

Since the beginning of robotics, the substitution of human labor has been one of the crucial issues. The focus is on the economic perspective, asking how robotics affects the labor market, and on changes in the work processes of human workers. While there are already some lessons learnt from industrial robotics, the area of service robots has been analyzed to a much lesser extent. First insights into these aspects are of utmost relevance to technology assessment providing policy advice. As conclusions for service robots in general cannot be drawn, we identify criteria for the ex-ante evaluation of service robots in concrete application areas.

1. Introduction

In the early days of using robots, German technology assessment of robotics and automation was in particular characterized by studies on the impact on the labor market. Back then, the basic principle of automation was strictly applied, i.e., the work processes were divided into individual action sequences in order to examine which of these sequences could be automated. As a result, a manufacturing process was established in which automatable action sequences were performed by machines while non-automatable tasks continued to be performed by humans. The main objective was the substitution of human labor in order to achieve an increase in efficiency through labor cost savings. Assembly lines were developed in which automated operations could be optimally coordinated, particularly in the automotive industry. The non-automatable actions to be performed

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