
Evaluation of Human-Robot Collaboration Models for Fluent Operations in Industrial Tasks

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Abstract

In this study we evaluated human-robot collaboration models in an integrated human-robot operational system. An integrated work cell which includes a robotic arm working collaboratively with a human worker was specially designed for executing a real-time assembly task. Eighty industrial engineering students aged 22-27 participated in experiments in which timing and sensor based models were compared to an adaptive model developed within this framework. Performance measures included total assembly time and total idle time. The results showed conclusively that the adaptive system improved the examined parameters and provided an improvement of 7% in total assembly time and 60% in total idle time when compared to timing and sensory based models.

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