

54th CIRP Conference on Manufacturing Systems

A machine learning-based image processing approach for robotic assembly system

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Abstract

Due to the boost of machine learning research in recent years, advanced technologies bring new possibilities to robotic assembly systems. The machine learning-based image processing methods show promising potential to tackle the challenges in the assembly process, e.g. object recognition, locating and trajectory planning. Accurate and robust methodologies are needed to guarantee the performance of the assembly tasks. In this research, a machine learning-based image processing method is proposed for the robotic assembly system. It is capable of detecting and locating assembly components based on low-cost image inputs, and manipulate the industrial robot automatically. A geometry library is also developed, which is an optional hybrid method towards accurate recognition results when needed. The proposed approach is validated and evaluated via case studies.

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Peer-review under responsibility of the scientific committee of the 54th CIRP Conference on Manufacturing System

Keywords: robot; assembly; machine learning; image processing
