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Exploring the Learnability of Assembly Tasks Using Digital Work Instructions in a Smart Factory

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Abstract

The trend towards individualized products leads to increased product variants and on-demand manufacturing. Assembly workers have to cope with constantly changing work instructions without impacting production speed. This paper explores the learnability of assembly tasks. A user study with transfer and 24h delayed retention tests compares how effectively assembly tasks can be learned using 1) an assistance system with digital work instructions and 2) paper-based work instructions. The results help to derive better structured work instructions and general recommendations for the design of assistance systems in the context of manual assembly.

Keywords: manual assembly; assistive systems; learnability; work instructions