Robotic Automation in Swedish Wood Product Industries

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Background
In Sweden, forest and wood product industries create over 10% of the total value added by the manufacturing industry [1]. Their net export value accounts for around 70% of the total Swedish export [2]. In addition, they constitute a vital step into the future since they utilize a renewable resource. However, wood product industries in Sweden as well as worldwide have fallen behind in the development and utilization of flexible and robotic automation in their production processes. In comparison to many other industry sectors, a time lag of about 30 years seems to be possible (see fig.1).

It is important to understand and identify the requirements, pre-requisites and hinders for successful implementation of industrial robots in wood product industries (see fig. 2).

Purpose and Aim
The research aims to support the introduction of flexible robotic automation into the wood working sector and its manufacturing processes. The purpose of the thesis is to:

- develop methods and strategies for successful introduction of industrial robots into wood product industries.
- develop solutions for standardized and flexible industrial robot cells.

Technology Readiness

- **Economy**: Utilizing robots is only profitable in more than one-shift work or in several machine cells at once.
- **Industry**: Batch sizes are often too small for a high profitability and many wood products are not adapted for robotic manipulation.
- **Technology**: Problematic due to a lack of supply chain management, material planning and process control.
- **Environmental impact**: Big potential for improved resource efficiency.
- **Social aspects**: Challenging to ensure supply of competent work force for the coming decades.
- **Material**: Manipulating the heterogenic material of wood can be performed easily.
- **Historical aspects**: Great possibilities to learn from other industry sectors.

Future Research

Mapping requirements, prerequisites and hinders from both an international perspective as well as from the perspective of robot manufactures and system integrators.

References

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