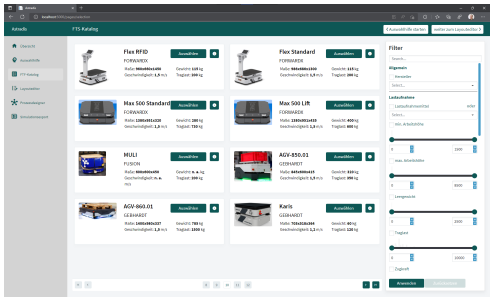
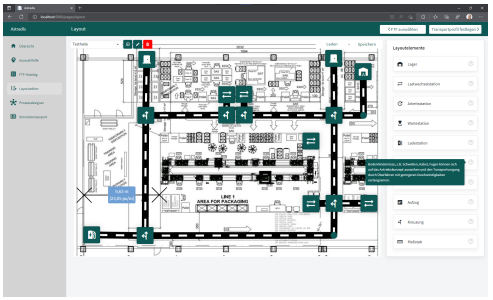
ASTRADIS

Automated Specification Tool for AGV Deployment in SMBs





Motivation

The deployment of automated guided vehicles (AGVs) to optimize intra-logistic processes is often difficult for SMEs, as the necessary requested, a tool was developed to support inexperienced users in system planning and selection.

Approach

To achieve this goal, a classification scheme for AGVs was developed and a solution catalog was created. For the requirements specification of the AGVs to be used, several process blocks were defined and integrated into a web based guided requirements specification system. In addition, an augmented reality solution was developed to record environmental conditions and define load transfer stations to support this process. To select suitable solutions, a recommendation system was implemented that automatically matches the recorded data and the characteristics of the systems in the catalog. In order to determine the necessary fleet size, a simulation interface was implemented, which allows the recorded and selected data to be converted into a material flow simulation.

Results

The developed system enables users to record planning-relevant requirements via a web-based user interface and suggests a selection of suitable systems. The use of the system does not require any significant previous knowledge in the planning of AGVs. This has been proven in user studies. In this way, employees of SMEs are enabled to carry out the initial steps independently, increasing the chance that projects for the deployment of AGVs will be continued beyond the initial phase. The ability to exchange planning data digitally and to automatically derive simulation models reduces the effort and coordination processes between SMEs and AGV vendors can be simplified.

Selected Publications

Hoppe, N.; Rolfs, L.; Petzoldt, C.; Putzka, A.; Freitag, M.: Konzept für ein automatisiertes Spezifikationstool für fahrerlose Transportsysteme. Planung und anforderungsgerechte Auswahl von FTS. In: Werkstattstechnik online, 112(2022)4, S. 232-237

Hoppe, N.; Freitag, M.: Implementation and evaluation of an assistance software to support decision-making, design and simulation setup for automated guided vehicle systems. In: IFAC-PapersOnLine. Elsevier, Amsterdam, 2023, pp. 11105-11110

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