

STELLENAUSSCHREIBUNG

Bachelorarbeit, Masterarbeit, Studentische Abschlussarbeit

STRUCTURED LITERATURE REVIEW: DECENTRAL JOB SHOP SCHEDULING

UMFELD

Modern production networks face challenges of volatility, uncertainty, complexity, and ambiguity [1]. Agent-based distributed manufacturing control is more robust and adaptive than traditional rigid control mechanisms and thus provide a response to dynamic change [2]. In such manufacturing systems, products and resources are modeled as autonomous, collaborative agents, called holons [3]. In order to achieve an efficient assignment of operations to machines in such systems, decentralized job shop scheduling mechanisms are needed (such as [4], [5]).

AUFGABEN

The aim of this thesis is to provide a global view on holonic manufacturing systems and a presentation of state-of-the-art mechanisms for decentral scheduling of operations. Therefore, a structured literature review (see [6]) on such mechanisms should be conducted.

WIR BIETEN

This thesis is written at FZI in corporation with Festo. This thesis is not an external thesis.

The FZI Research Center for Information Technology is a non-profit institution for applied research in information technology and technology transfer. Its task is to provide businesses and public institutions with the latest research findings in information technology.

Festo is the global leader in automation technology and the world market leader in industrial training and development. Over 60 years in factory and process automation makes them a competent partner with know-how, an eye for the big picture, and attention to detail.

WEITERE INFORMATIONEN

- [1] O. Mack, A. Khare, A. Krämer, and T. Burgartz, *Managing in a VUCA world*. Springer International Publishing, 2015.
- [2] P. Leitão, “Agent-based distributed manufacturing control: A state-of-the-art survey,” *Eng. Appl. Artif. Intell.*, vol. 22, no. 7, pp. 979–991, Oct. 2009.
- [3] H. Van Brussel, “Holonc Manufacturing Systems,” in *CIRP Encyclopedia of Production Engineering*, Springer Berlin Heidelberg, 2014, pp. 654–659.
- [4] S. Fujii, T. Motohashi, T. Irohara, and Y. Miyamoto, “A Basic Study on the Installation of Distributed Autonomous Production Scheduling System in Ubiquitous Environment,” in *IFIP Advances in Information and Communication Technology*, vol. 338 AICT, 2010, pp. 41–48.
- [5] H. E. Nouri, O. Belkahla Driss, and K. Ghédira, “Solving the flexible job shop problem by hybrid metaheuristics-based multiagent model,” *J. Ind. Eng. Int.*, vol. 14, no. 1, pp. 1–14, Mar. 2018.
- [6] J. Webster and R. T. Watson, “Analyzing the Past to Prepare for the Future: Writing a Literature Review on JSTOR,” *MIS Q.*, vol. 26, no. 2, pp. 13–23, 2002.

Contact:

If you are interested, send your application (short motivation, recent CV) or your queries to:

Wolfgang Badewitz

badewitz@fzi.de

- Themen-Schwerpunkt: Market and Feedback Mechanisms, Produktion und Logistik
- Kontakt: **Wolfgang Badewitz**, badewitz@fzi.de, Tel.: +49 721 9654-823