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Production Line Layout Planning Based on Complexity Measurement

Authors : Guoliang Fan, Aiping Li, Nan Xie, Liyun Xu, Xuemei Liu

Abstract : Mass customization production increases the difficulty of the production line layout planning. The material distribution process for variety of parts is very complex, which greatly increases the cost of material handling and logistics. In response to this problem, this paper presents an approach of production line layout planning based on complexity measurement. Firstly, by analyzing the influencing factors of equipment layout, the complexity model of production line is established by using information entropy theory. Then, the cost of the part logistics is derived considering different variety of parts. Furthermore, the function of optimization including two objectives of the lowest cost, and the least configuration complexity is built. Finally, the validity of the function is verified in a case study. The results show that the proposed approach may find the layout scheme with the lowest logistics cost and the least complexity. Optimized production line layout planning can effectively improve production efficiency and equipment utilization with lowest cost and complexity.

Keywords : production line, layout planning, complexity measurement, optimization, mass customization
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