MODELING AND OPTIMISATION OF PRECEDENCE-CONSTRAINED PRODUCTION SEQUENCING AND SCHEDULING FOR MULTIPLE PRODUCTION LINES USING GENETIC ALGORITHM

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TÓM TẮT:

This paper presents an integrated methodology for the modelling and optimisation of precedence-constrained production sequencing and scheduling for multiple production lines based on Genetic Algorithms (GA). The problems in this class are NP-hard combinatorial problems, requiring a triple optimisation at the same time: allocation of resources to each line, production sequencing and production scheduling within each production line. They are ubiquitous to production and manufacturing environments. Due to nature of constraints, the length of solutions for the problem can be variable. To cope with this variability, new strategies for encoding chromosomes, crossover and mutation operations have been developed. Robustness of the proposed GA is demonstrated by a complex and realistic case study.