

**SIMULATION AND OPTIMIZATION OF CUTTING TOOLS FOR THE POCKETS
MACHINING IN 2D½**

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Abstract

The manufacturing time minimization is a major objective to be taken into account since the selection of machining parameters. The cutting tool diameter is one of the parameters which influence enormously the machining time of the different geometric shapes, and in particular, the pockets. In this paper, we developed an optimizing methodology of the cutting tools selection for the quadrilateral pockets machining in 2D½. For this, we developed some analytic models expressing the path length of the cutting tool. Then, we structured an optimizing method based on the cutting time minimization. A simulation data processing tool was developed by means of MATLAB® software, which generates the cutting tool optimal diameter from the pocket geometric information. To validate our approach, we treated an application example of an ordinary quadrilateral pocket in 2D½. 9 refs.

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Key Words: *Machining, Pocket, Cutting Conditions, Optimization, Tool Selection*

SIMULATION BASED DESIGN AND RECONFIGURATION OF PRODUCTION SYSTEMS

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Abstract

In the time of constant changes in market demands for certain products and their amounts, time to market period is limited by the increasing competition influence. The global approach allows multinational and trans-national companies, by being present in great many markets, to market their products, which are made as a result of mass production, in smaller amounts at separate markets, leading to price decrease of these products. This conditions the need to find a way for the shortest answer possible for every customer's demand, with respect to their demands. The time for designing a product, working process and production system, procuring necessary material, equipment and tools, production and delivery should not be the reason for a decreased degree of competitiveness. This paper presents the approach in developing a method for designing production systems supported by building simulation model of the system and the working process by specialized software. Results and information acquired by simulation process should make possible the analysis of the proposed variations and making the decision on designing and later on reconfiguration of the production working unit at the moment when the values of the critical number of parameters exceed the limits of allowed deviations. 15 refs.

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Key Words: *Production System Reconfiguration, System Designing, Simulation Software, Model, Optimisation*

AOA-BASED MODELLING AND SIMULATION OF CONSTRUCTION OPERATIONS

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Abstract

The construction of building projects is often challenged by tight budgets and limited time and resources. These challenges have forced many construction firms to downsize and re-engineer their operations to improve productivity and cost effectiveness. Re-engineering, however, requires thorough analysis of company-specific operations and resource use, which differ from one construction firm to the other. Simulation can be an effective way of analyzing the operations of construction firms. Developing simulation models, however, is not a simple task and can be complex, time consuming, and costly. In an effort to simplify the modelling process, this paper presents an activity-on-arrow (AOA)-based approach that offers the diversity and flexibility required for construction. The main advantage of this approach is that it uses object-oriented simulation capabilities on traditional AOA networks used for scheduling construction projects. It helps generating practical models without prior knowledge of simulation terminology or the underlying theoretical aspects. 15 refs.

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Key Words: *ComputerApplications, Construction, Process Analysis, Modelling, Simulation*