ANALYSIS OF TRANSPORTING SYSTEMS MODELING BY PETRI NETS

CIORTEA Mihaela Elisabeta
University "1 Decembrie 1918" of Alba Iulia
ciortea31mihaela@yahoo.com

KEYWORDS: Petri Nets, menufacturing, transporting, conveyor

This paper presents an approach for control and monitoring of discrete events systems. This paper demonstrative a new approach that integrates the modelling, simulation and control of FSM by using Petri Nets.

This paper presents a case study for Petri Net based modelling of manufacturing processes. It describes some evaluation of models of transportation facilities. The use of Petri Nets leads to compact models of complex processes which include some repeating structures. The net's transitions can be attributed by at least duration and firing probabilities. In the evaluation process the model can be validated by formal analysis.

Modelling distributed systems with the help of *Petri nets* takes place at the state level. Therefore, the actions produced in the system are identified, as well as the states that precede these actions and the states that the system will experience after the actions are produced. By simulating the state model through Petri nets, a description of the system's behaviour is obtained.

Considering the analyzed aspects and the conclusions presented related to algorithms, the thesis analyzes the transport system within the company SC APULUM SA, Alba Iulia..

The twin speed conveyor is a conveyor belt for transportation of discrete material such as boxes or cases.

The twin speed conveyor is used to transform a stream of randomly arriving boxes into a continuous stream, without bringing the boxes into direct touch.

In the model presented in this paper decided to remain at the coarse level. In reality the pushers act only at discrete positions and push the boxes exactly to the next position.

In reality, the distance of a movement initiated by pusher in this case would be shorter than one position, but both the final position after this movement and the activitation time of the pusher match the chose grid.

In the Petri Net model, each position of the conveyor is represented by a place which can be marked or not, referring to the presence or absence of a box at this position. The conveyor belt appears as a chain of places. The places will be connected by transitions to model the boxes' transit from one position to the next. Transitions can be activated individually, thus representing the hurried movement of boxes when the appropriate pusher is activated.

A graphical description of Petri nets is easy to understand and it is very useful in an as natural as possible description of real distributed systems.

Petri nets can model phenomena that are specific to discreet event systems, such as succession, choice or conflicts, concurrence, synchronisation, mutual exclusion, which can be formulated in temporized or non-temporized contexts. The information obtained through a description of discreet event system dynamics can be easily implemented on Petri net type architectures.

Considering the analyzed aspects and the conclusions presented related to algorithms, the paper analyzes the transport system within the company SC APULUM SA, Alba Iulia.