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DISCRETE EVENT SIMULATION MODEL FOR A COMPLICATED SYSTEM

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ÖZET

Bu çalışma kesikli olay simülasyon modellemesini içermektedir. Kesikli olayların sistemi temsil edecek simülasyon modelini kurmak, özellikle karmaşık yapıdaki bir sistem için oldukça zordur. Bu nedenle burada karmaşık yapıda olan bir tanker probleminin simülasyon grafiği ve SLAM II veya SLAMSYSTEM şebeke modelinin kurulması detaylı olarak anlatılmıştır. Bu kurulan modeller bilgisayar desteği ile kolayca simüle edilip sistem yapısı hakkında önceden bilgi sahibi olunmasını sağlar. Alınacak sonuçların güvenilir olması, kurulan modelin güvenirliliği yani modelin sistemi ne derece temsil etmesine bağlıdır. Her sisteme uygun ardından kullanılacak bilgisayar program yapısına göre çeşitli sayıda model geliştirilebilir ve hatta alt programlar yazılarak daha verimli hale getirilebilirler.

I. INTRODUCTION

In this paper, we will formally define a graph structure to represent the event scheduling approach. This structure is not only useful for constructing and analyzing discrete event simulation models, but also sufficiently powerful to represent any computational procedure as we know it today.

In the context of discrete event simulations, graphical representation of models play a crucial role. In fact, the process interaction and activity scanning approches have been stimulated by the availibity of graphical techniques for representing system structures. Block diagrams of GPSS or process networks of SLAM II or SLAMSYSTEM have made the interaction simulation models popular. We will start by reviewing the relevant work that has appeared in literature.

II- LITERATURE REVIEW

II.1 Evans (1967)

In discussing the organization of an event scheduling discrete event simulation model, Evan concentrate on four considerations: the units of the model, the event occurences during simulation, the decision made during simulation, and the routines making up the program.

A unit of the model is a particular kind of component in the model. An event occurencc leads to the altering of the state of one or more units of the model, and hence of the model itself. Event occurences can interact with one another in two ways. An occurence can cause the scheduling of further event occurences. It can cause the cancellation of event occurences that were previously scheduled. [1]

II.2-Torn (1981)

Torn introduces a graphical technique which incorporates several extentions of Petri nets. A Petri net can be represented as a net graph, PN=(P,T,I,O), where P is the set of places, T is the set of transitions, and I and O are the functions.

Places, which represent conditions, are represented as circles on the graph. Transitions, which represent events or activities, are represented as bars. The conditions necessary for a transition T to occur are connected to T by directed arcs. The dynamics are represented by black dots traversing the graph. A black dot at a place implies that the corresponding condition holds. A transition may occur only when all input conditions are met. The distribution of black dots on a Petri net defines the state of the net and called its marking.

Petri nets are useful in modeling concurrent system. In addition, they can be used to verify certain desirable structural properties of models. [2]

II.3 Schruben (1983)

The elements of a discrete event simulation are state variables that discribe the system, events that change the values of state variables, and the relationships between events. An event graph is a structure of the objects in a discrete event system that facilitates the development of a correct simulation model.

An event graph may be used to guide the developments of event-scheduling simulation program