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Computer Systems Modeling And Simulation To Do

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Abstract: This article Computer Simulation to the topic entrance is, its main aspects, especially practical in use advantages and what are the disadvantages analysis does. Home Advantages as: model repetitive use possibility; complete not been information with work ability; real to the system relatively information cheaper and easier to get; and especially mathematics in modeling there is not been dynamic random variables using complicated problems solution can to take such as features is emphasized. Main Disadvantages as is: simulation models of creation expensive and time demand; output and entrance variables optimal solution between or clear dependency directly give cannot; and the model evaluation complicated process that is brought.

Keywords: Computer, simulation, information, mathematician modeling.

INTRODUCTION:

Information technologies people his life this until changed, to computers related not any activity imagination to do almost possible The first computer systems appearance to be as soon as, people different in the fields complicated problems solution to do for the purpose computers from the advantages to use movement. With the development of industry, the requirements for computers and computational programs in structural analysis have also increased. Traditional construction methods have been replaced by computer programs that can predict the behavior of structures under various loading conditions [1, 2]. Therefore, instead of expensive experiments, tests and inspections, cheaper and more powerful computational methods that do not require the destruction of a structure have been used to determine its strength.

Theoretical foundations of computer systems modeling

Computer systems constantly receive a stream of requests (transactions, data packets) and service these requests using limited resources (processor, memory, network channel). Three fundamental mathematical tools are mainly used to model this process: waiting theory, Markov chains, and distributions in probability theory.

Queuing theory. Queuing theory (or queuing theory) is a fundamental tool for studying the relationship between the random demand for resources in a system and their service capacity. This theory is ideal for predicting the waiting time and the level of resource occupancy in a system.

The process of creating and modeling a reliable computer model

Computer programs help to solve precisely such problems. First, a simulation of the real system should be carried out, and then, if the simulation gives satisfactory results, it is possible to implement (implement in practice) the previously tested system. A computer simulation or computer model has the task of simulating an abstract model of a specific or equivalent system. Computer simulations have become a useful part of the mathematical modeling of many natural systems in physics, mechanics, chemistry, biology, economic systems, psychology and social sciences, as well as in all areas of engineering, which allows a better look at the operation of the above-mentioned systems [1, 3, 4].

To have a useful model, it is necessary to determine its behavior for a defined and limited set of variables. This means that for some random input parameters, corresponding output values are observed.

Computer modeling and computer simulation

In everyday life, simulation (imitation) can be associated with various activities. If this word is used in computer technology, then the term simulation refers to the process of creating abstract system

models from the real environment and conducting a corresponding number of experiments on them. When these experiments are conducted on a computer, they are called computer modeling and computer simulation (Figure 1).

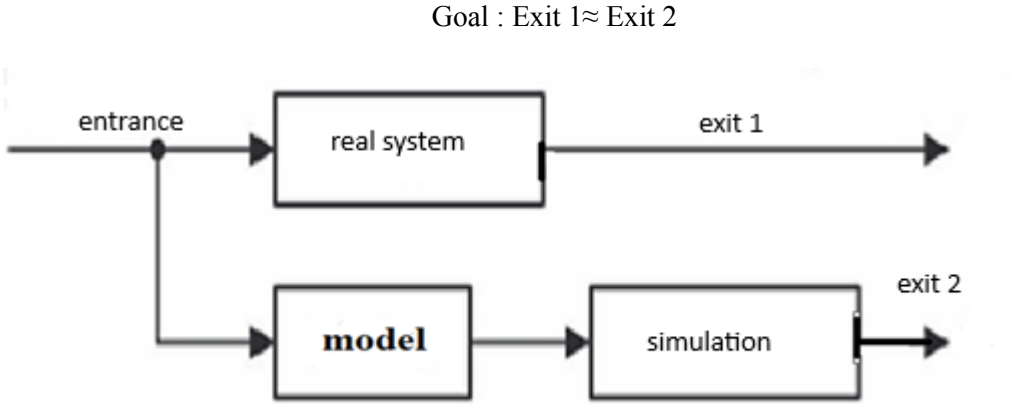

Figure 1. Relationship between real system modeling and computer simulation.

When considering models and simulations, the input data is variable and depends on many factors. For example, some models require very simple input (e.g., simulation of an alternating current sinusoid based on a few numbers), while other models require terabytes of input data (e.g., simulation of weather or climate change).

Input data is provided by the following various devices:

- Sensors and other physical devices connected to the model;
- A control panel that directly affects the progress of the simulation in some way;
- Current or old data entered manually;
- Values representing the outputs of other processes or operations;
- Other models or simulations release elements representative values.

This emphasize okay, external from sources information acceptance to do systems " caution " must be ": they this information what meaning and which to the elements in fact connected knowledge need. To be precise attention to be given need and mistakes to the surface absence If errors appearance if they are to the minimum reduction Need to. To the computer integrated mathematics perfect not, that's why for approximate results, results reduction or small mistakes neutralization potential of mistakes to grow take arrival possible. Some in cases simulation result correctness and from it next calculations and in simulations use possible check for to the surface arrived mistakes analysis to do necessary. Even original input in the data small mistakes are also next in simulations noticeable to mistakes accumulation possible [1, 4, 5].

We modeling and from simulation what for Do we use them? Is it necessary? This questions often is given, their creation and application for and many reasons available, of which the most important ones are:

- It is impossible to determine the analytical solution of an analytical model.
- The system is too complex to be described analytically.
- Experimentation within a real system, or in a real system itself, is often either impractical or too complex. Modeling and simulation can show how much further investment in experimentation is justified.
- to understand the functionality of an existing real-world system, the structure of which is largely unknown or inaccessible.
- When optimal or optimized performance of a system is required, various parameters need to be changed. If a real system is considered, this is often impossible because such a system does not exist. In other words, such a system has not yet been built, or the cost of such an experiment is prohibitively high. Such in situations modeling and simulation the most good is the solution.
- Sometimes of the system to the violation take coming conditions simulation to do need will be. The real system to the violation and many in cases road is not allowed, therefore for such in situations computer simulation only is the solution.
- Real system or his/her within the scope far term processes When it comes to time, problematic factor to be possible. Such in situations computer simulation " speed up " the process and him/her artificial accordingly abbreviation possible.
- Real system or his/her within the scope

extreme fast processes when it comes to computer simulation high at speed processes step by step or slowly observation opportunity giver is the solution. This is very important, because in real life or in a real environment this possible it's not.

- Sometimes experience different to the reasons according to stop need will be, in real conditions and this often impossible. Such of experience computer simulation as for, no how problem no, because simulation stop and necessary when continue to hold possible.

Advantages and disadvantages of computer simulations

Like everything in life, computer simulations are not perfect and have their own problems. Simulations are generally very useful, but they have their advantages as well as disadvantages.

The main advantages of computer simulations are:

- Once a model is created, it can be used repeatedly to analyze the required process, structures, and similar elements.
- the input data is incomplete and has a certain degree of discretion, computer simulations can be very useful.
- In many cases, it is easier and cheaper to obtain the output of a simulation than to obtain the output of a real system.
- generates the necessary data that can be used to evaluate any system characteristic and study its effects without major limitations.
- may be the only way to properly solve problems.
- Computer simulation can describe and solve complex problems using dynamic random variables that are not available in mathematical modeling.

Computer simulations main disadvantages

- Simulation models create and computer simulations expensive and many time demand to do possible (this them working exit, test transfer and check for necessary was to time relevant).
- Computer from simulations use through exit and entrance variables between dependency both, optimal solutions also to take possible it's not.
- Simulation models and computer simulations working exit and from them use for different tools and methods according to knowledge demand is being done.
- Model assessment much complicated process is different in environments additional experiment to transfer demand does.

So regardless, computer simulation very useful thing is, its application possible was environment and in situations quickly increasing Obviously, the computer simulation application to the shortcomings than more to the advantage has and computer simulations daily of life almost every one field and in the environment advantage to do confidence there is

CONCLUSION

With an in-depth analysis of the advantages and limitations of computer simulation techniques, author Dragan Cvetković solidifies the place of simulations in modern science and technology. The evidence presented in the chapter shows that simulations are an indispensable tool not only for analyzing existing systems, but also for testing new ideas and solving complex problems.

The greatest advantage of simulation is its reusability and cost-effectiveness in relation to real-world conditions. Once a model is developed, it can be analyzed an infinite number of times, much cheaper and faster than physical experiments. In particular, the ability to provide useful results even when the input data are incomplete makes simulation superior to mathematical modeling, as it can incorporate dynamic random variables. In some extremely dangerous or impossible situations (such as nuclear reactions or space flights), simulation becomes the only logical way to solve a problem.

Restrictions and them acceptance to do necessity.So despite the simulations perfect Not . Disadvantages mainly working exit process complexity and cost with Depends. High good quality simulation model create and him/her from the test transfer big time and Funding requirement also does various tools according to deep expert knowledge demand does. Most importantly, simulation the optimal solution or entrance and exit between straight away analytical the formula give can't; he just certain under the circumstances the result guess does this and additional analysis and evaluation necessary does. Computer simulations application advantages noticeable at the level is superior. Technologies development with the model create and assessment processes simplifying goes, this and simulations importance further As a result, the simulations current on the day wide being used with fields (engineering, physics , computer science) one in line , in the future daily of life almost every one field and in the environment advantage doer analysis and prophecy tool to be inevitable .

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