MATHEMATICAL METHODS, MODELS AND INFORMATION TECHNOLOGIES IN ECONOMY

ANALYSIS OF SMART TOOLS OF DECISION-MAKING SUPPORT IN ECONOMIC TASKS

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In intelligent decision support systems development is necessary to answer the question, what tool would be most effective? The same problem often can be solved by several methods. Therefore, it is important to analyze the advantages and disadvantages of each method, and find out, which of them would be most effective for specified task.

In this article we are analyzing main areas of artificial intelligence and making conclusion about it applicability.

Expert system is emulates the decision-making ability of a human expert. Expert systems has finding application in a wide range of categories, like interpretation, prediction, diagnosis, design, planning, monitoring, debugging, repair, instruction, control.

Fuzzy logic is a form of logic in which the truth values of variables may be any real number between 0 and 1, considered to be "fuzzy". It can be used like a logical base with expert systems, neural networks and other AI methods in specific applications, when linguistic variables are needed.

Decision tree is a decision support tool that uses a tree-like graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. Decision trees can be used to solve tasks like a data description, classification, regression, operations research, strategy identifying, analyzing of data significance.

Artificial neural network are a family of models inspired by biological neural networks. Now it is most powerful and most popular decision support smart tool. Such tools are have been used to solve a wide variety of tasks that are hard to solve using ordinary rule-based programming. Main types of artificial neural network application are represented by regression analysis, classification, data processing (filtering, clustering compression) and others.

Genetic and other evolutionary algorithms is a search heuristic which generate solutions to optimization problems using techniques inspired by natural evolution. Main application of this methods are optimization, automated design, finding errors, testing, training other algorithms (like neural networks, decision trees), clustering.

Simulation modeling is the process of creating and analyzing a digital prototype of a physical model to predict its performance in the real world. Simulation modeling includes a system dynamics, a discrete-event simulation and agent-based models.

System dynamics has found application in a wide range of areas, for modeling systems, which usually interact strongly with each other.

A discrete-event simulation models the operation of a system as a discrete sequence of events in time. They are particularly well equipped to help users diagnose issues in

complex environments and found application in queue theory tasks solution.

An agent-based model is simulating the simultaneous operations and interactions of multiple agents in an attempt to re-create and predict the appearance of complex phenomena. These models are using to solve a variety of economy, business technology problems when agent individuality is need to obtain.