

Intelligent Simulation For Autonomous Manufacturing Systems

Nagen N. Nagarur

Asian Institute of Technology
Thailand

Nirmal K. Baid

Asian Institute of Technology
Thailand

Intelligent Simulation For Autonomous

There is a steady progress of modern technology towards autonomous manufacturing systems. Simulation could be a major component in the systems, to achieve a high degree of autonomy. Simulation modeling is a technique of building computer models of a system so that its behavior can be studied without the need of building, disrupting the operation of, or destroying the real system. The weakness of simulation include long model development time, throwaway nature of the models, inability to provide an aid to real time decision making etc. An intelligent simulation system (ISS) can overcome some of these difficulties. The ISS would interpret the requests given by the user and develop a software model for the system. Then it would determine the experiment to generate the relevant answers and the form of output. It would retrieve the necessary information and software modules, execute the software modules in proper sequence and provide the right answers in an appropriate form. If necessary, it would guide the decision maker in generating different solutions so that the most appropriate decision can be reached upon. By the use of ISS, simulation can be brought into the hands of practicing managers and engineers from the hands of simulation experts, or can be directly linked to automated control systems. In this paper, an overview of ISS is given and its different modules are described. A brief survey of the implementation of these modules is presented. Some suggestions are put forward to integrate the simulation modules into autonomous manufacturing systems.

Keywords: Intelligent Simulation, Expert Post Processing, Automatic Specification Acquisition, Autonomous Manufacturing.