Simulation Modeling for Decision-Makers

Overview

This course is designed for decision-makers and analysts who would like to understand the nature of simulation and how it can be used to design and optimize their systems. The fundamental responsibilities of the decision-maker for simulation-project success are also discussed. The course can be customized to your particular application such as defense or manufacturing. The seminar is typically four hours in length and has no prerequisites. The following is a partial list of organizations to which this seminar has been presented

Defense: U.S. Air Force, U.S. Army, Naval War College, National Security Agency, National Geospatial-Intelligence Agency, Missile Defense Agency, Los Alamos National Lab, Lockheed Martin, MITRE, Rockwell

Manufacturing: IBM, Intel, 3M, GE, Nabisco, Whirlpool

Others: UPS, Time Warner, CSX

What You Will Learn

1. **Why Models and Simulations are Necessary**
   - Use of simulation models within your industry
   - Types of models – analytical solutions, discrete-event simulation, agent-based simulation, continuous simulation (e.g., system dynamics)
   - Benefits of simulation modeling
2. **Example Illustrating the Use of Simulation**
3. **Steps in a Sound Simulation Study**
   - Formulating the problem
   - Collecting information/data and deciding on the level of model detail
   - Selecting simulation software
   - Modeling system randomness
   - Developing valid and credible models
   - Designing and analyzing simulation experiments
   - Documenting and presenting the project results

4. **The Decision-Maker's Role in a Successful Simulation Study**
    - Control and commitment of resources
    - Problem formulation
    - Approval of important model assumptions
    - Common misconceptions
5. **Ten Critical Pitfalls in Simulation Modeling and How to Avoid Them**
    - Modeling process and validation
    - Simulation software
    - Modeling the randomness in a system
    - Design and analysis of simulation experiments

Critical Questions That the Seminar Will Answer

- What are modeling and simulation and how can they solve your organization's problems?
- What expertise is needed to perform sound simulation studies?
- How do you determine the best software to use for a particular application?
- What role does the decision-maker play in a sound simulation study?
- How can simulation reduce the risks in decision-making?
- What are common management misconceptions about simulation that can reduce its effectiveness?