

# Validity and Credibility

2-9-2011

# Opening Discussion

- What did we talk about last class?
- Do you have any questions and the reading?
- Do you have any questions about the assignment?

# Increasing Validity and Credibility

- A verified model isn't of any use unless it reproduces the real system and people believe it.
- For this reason we need to validate our models and also work on building their credibility.

# Collect Good Data

- Talk to SMEs.
- Observe the system
  - Make sure the data collection is done properly by people who know what to do. (Automation probably helpful these days.)
  - Pitfalls
    - Data not what you want to model.
    - Data not right type or format.
    - Data contains various types of errors.
    - Data is biased.
    - Data have inconsistent units.

# More on Data

- Compare to existing theories.
- Compare to similar simulations.
- Use the intuition of the modeler.

# Interact with Manager

- Keep the manager involved so that they will want to use the model and they will believe what it says.
  - They can help figure out what the problem really is.
  - Keep them interested.
  - They are an SME.
  - If they help build it they will think it a lot more credible.

# Assumptions Document

- Maintain a document that describes what problem you are solving and how.
- List the assumptions made in your code.
- Have enough detail to be a blueprint.
- Walk through the document with the people who matter.

# Validate Components

## Quantitatively

- Check whether separate distributions of data can be safely merged.
- Do sensitivity analysis on parameters, distributions, etc.



# Validate Output of Full System

- Compare with an existing system.
- Compare with expert opinion.
- Compare with another model.

# Animation

- Like with the verification, animations can also help with validation and increase credibility.

# Role of Management

- Managers have a number of roles in a simulation project.
  - Formulate the problem objectives.
  - Help in getting the cooperation of key personnel.
  - Interact regularly with the modeler.
  - Actually use the model when it is done.

# Comparing Sims to Real-World

- In the end, the data from the simulation needs to be compared to the real world as much as possible to lend validity to the model.
  - Inspection approach
  - Confidence-interval approach
  - Time series approach
  - Other approaches

# Minute Essay

- Do you have any questions about the topic today?
- We have a quiz at the beginning of next class.
- Next class we take a break from Discrete Event simulations and look at continuous systems.