**Problem Overview**

- Behavioral model development and testing is time-consuming and expensive.
- Engineers can reduce development costs and times by reusing previously developed models.
- Engineers need a way to archive their models and to search for them at a later date.
- This requires engineers to characterize and represent the salient knowledge about their models—called behavioral model meta-knowledge.

**Research Questions**

- What knowledge about behavioral models must engineers characterize?
- How can engineers represent this knowledge?

**Knowledge about Validity Properties**

- What engineers need to know about limitations of models and quantities.
- A valid model is one that is sufficiently accurate for the needs of a user.
- Accuracy depends on the situation in question, or context.

**Knowledge about Problem Quantities**

- What engineers know about the constants, parameters and variables involved in an behavioral analysis problem.

**Schema for Behavioral Model Meta-Knowledge**

- **Assumption**: A text description of simplifying assumptions embodied in a model.
- **Context**: A set of quantity values over which an inaccuracy statement is true.
- **Inaccuracy**: A measure of how well a model represents reality.
- **Quantity Restriction**: Levies a restriction on the possible values of a quantity.
- **Bounded**: A simple restriction type with upper and lower bounds.
- **Constant**: A quantity of fixed value over all simulations.
- **Parameter**: A quantity of fixed value for a particular simulation.
- **Variable**: A quantity whose value may change or is determined during simulation.

**Behavioral Evaluation Process during Engineering Design**

Engineers retrieve appropriate behavioral models from a repository, thus saving development times and costs.

**Configuration Control Information**

- To allow management of repository entries.

**Model Interface Information**

- **Description of interface to model**.
- **Engineers use this when searching for models that are compatible with their simulation problem**.

**Results and Contributions**

- Identified behavioral model meta-knowledge required for behavioral model repository.
- Developed UML model for behavioral model meta-knowledge representation.
- Created demonstration implementation of a behavioral model repository.

**Related Publications**