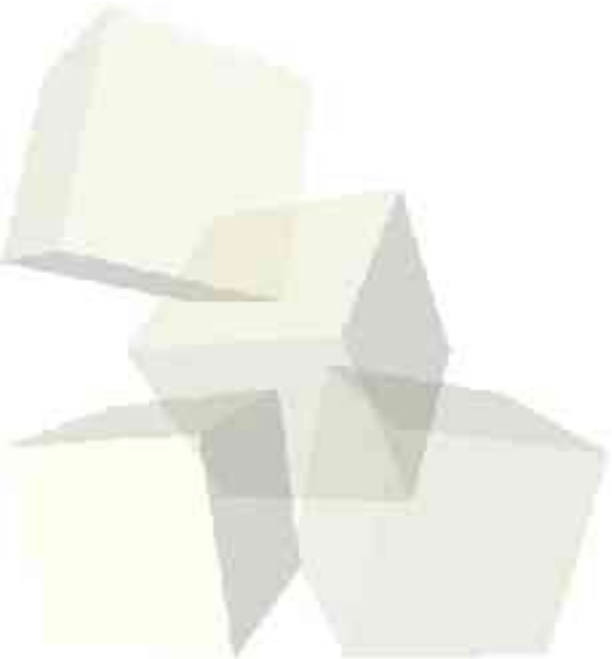
Examples of Multimodeling

4-5-2005

Opening Discussion

- What did we talk about last class?



Aggregation and Decomposition

- We went over this concept last time. In this type of multimodel, information is passed between different models at the same level. There isn't communication for a high level to a lower level.
- This would be for a system where there isn't an active overlying model and items pass from one model to another at the lower level.

Abstraction and Refinement

- A more general way of organizing multimodels is through abstraction and refinement. Here a higher level abstracted model can (and is) decomposed so that parts of it are actually more refined models.
- Many of the examples we looked at last class fit into this category. The bottling plant with a petri-net at a high level and refinements for the machines is an example of this.

Abstraction as Homomorphic Simplification

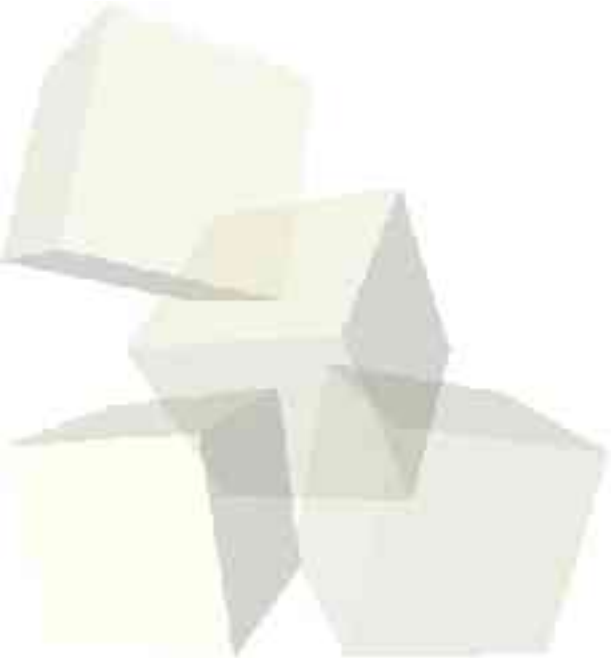
- An abstraction can be viewed as a mapping of groups of events into single events.
- Consider our bottling factory. At the higher level the transitions are just that, transitions that can fire and have a certain time delay. If we stick FSAs for the machines in, then that single event maps to many events of a bottle passing through the machine.

Discontinuity and Integration

- One potential problem with multimodels occurs if a high level model and switch states and the low level models are integrating equations that vary with the state.
- If we use time slicing, the discontinuity of moving from the first state/set of equations to the other could cause drastic inaccuracies. To deal with this we have to find the exact moment of transition and take a partial step to that point, then use the second model for the rest of the step.

Code

- Today we want to finish the code for our lid. We've said that a few times now, but this time we'll actually go through the math and hammer things out instead of debating techniques.



Minute Essay

- Are you making any progress on your project? If so, how much? If not, why not?