

Modeling and Simulation in Robotics Workshop

Breakout Summary Slides

Team 5

Breakout 2

Team 5: Consensus on Barriers

- Usability: large effort to build and utilize simulators, expert settings of parameters
- Composability: how to link things together, rules of construction, systemic effects, i.e. synthetic biological systems
- Validation: bound to fail; never can find appropriate model that satisfies constraints, what does it mean to be correct?
- Specifications: is current specification language rich enough? Goals in robotics may not be formally describable.
- Heterogeneity: Time and space scales, different paradigms (finite/continuous, deterministic/probabilistic, etc.)
- Observability: What is known about the environment?

- Understanding: knowing how it works is too much, but need to know when it gives garbage
- Representations and Assumptions: how to know when properly specified?
- Tradeoff between accuracy (specific) vs. adaptability (general);
- If you change parameters, will it still work?
- How much prior information is needed: real-world; is it commensurate with level of knowledge?

Team 5: Multiple viewpoints

- Improvement of simulators: end-to-end monolithic vs. modular architectures
- Will we ever get to the levels and layers of Electronic Design Automation (EDA) or Open System Interconnect (OSI)?
- Need to tie together models of sensors with environments?
- How to train or recruit people in these areas? Need for new curriculum?
- Video games lack physical models.
- Bias in robotics against modeling and simulation--cannot publish without hardware demonstration.
- How to make models/simulations to make them trusted in robotics community
- Need for Grand Challenge for this area?