

Modeling and Simulation in Robotics Workshop

Breakout Summary Slides

Team 5

Breakout 1

Slide 1: Consensus Thinking

- Role of modeling and simulation in development and testing (may be different)
 - Verification and Validation
 - Risk analysis
 - Autonomy Development vs Control Development
 - Embedded models: models used for control
 - ML for lifecycle prediction, reliability / maintainability
 - Non-temporal models, finite element models, structures analysis, load balancing
- Planning
 - gait, mobility, manipulation, multi-agent,
- HRI
 - HCI, HMI, VR, AR
- UAVs, UGV, UxV... Medical, Legged, Winged, Rotor, Manufacturing/Industrial, Home, Entertainment, Perception/Action System

Slide 2: “Somewhat contentious” Ideas

- Augment analytical models with empirical models – extent
- Maintain virtual model of robot (digital twin)
- Require metrics for safety (how do I do this?)
- XAI – interpreting/analyzing “black box” models, guarantees

Slide 3: Odds and ends, out there thoughts, fun stuff

- What is the framework for understanding when you need high/low fidelity for models
- Is a single simulator reasonable? How do you integrate multiple simulators/models?
- Assured learning

Cheat Sheet Slide

- Breakout Themes, “M&S in Robotics” workshop:
 - Breakout 1: Panoramic view of opportunities
[a time to dream]
 - Breakout 2: What’s stopping us from getting there
[the reality check]
 - Breakout 3: Pragmatic suggestions for moving forward
[what funding organizations, the robotics community,
or other vested parties can/should do]

- Breakout session, things to keep in mind
 - You have 25 mins to generate your three slides
 - Select a scribe to generate your three slides
 - Decide who will present your slides in plenary
 - Do not argue within team for more than 2 mins about an idea. Move it to “Slide 2” and proceed
 - Generate diverse/original/out-there ideas
- Plenary session, things to keep in mind
 - Each team has 5 mins to present its slides
 - We seek to collect as many original ideas/points of view/opinions as possible
 - Settling contentious issues not a priority
 - Use open-floor discussion to add to what the teams have presented
 - Limit your remarks to one to two minutes. Give others an opportunity to speak. Keep it fun, keep it friendly