

# Modeling and Simulation in Robotics Workshop

Breakout Summary Slides

Team 3

Breakout 3

# Slide 1: Consensus Thinking and Issues

- Grand challenge: to go beyond RBD, demonstrate sensor simulation, multi-physics, etc.
  - How do we define a good challenge with clear target capabilities and clear metrics?
  - How do we define a challenge that captures attention?
  - Simulators need to predict real robot data
  - Can we have a challenge that only involves simulation (without control, etc.)
- Define appropriate levels of modeling/abstraction for different problems
- Investment in software over long time span (better communicate with funding agencies on the scientific challenges, opportunities for new capabilities, reach out to industry)
- Build benchmarks for simulation / develop standards
  - Data from real robots?
  - Verification/validation of numerical simulation: look at simple problems with known quantitative effects
- Reach-out to other fields with lots of knowledge in simulation (e.g. CFD)
  - Modeling for synthesis is different from typical modeling in science!
- Proposed modes of judgements to editors to decide whether simulation work is correct
- Write a paper together to get this vision/roadmap out

## Slide 2: “Somewhat contentious” Ideas

- Enter your handful of thoughts here

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

- Modeling and simulation is harder than you think
- Modeling for synthesis is different from “typical modeling”

# 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