

Massachusetts Institute of Technology 

Diagnosing Complex Systems with Software-Extended Behavior using Constraint Optimization

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Model-based Embedded & Robotic Systems

Software-Extended Systems



Mars Polar Lander



MERS Rover Testbed

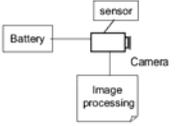


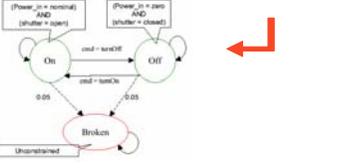
Earth Observing One

2

Vision-based Navigation Scenario

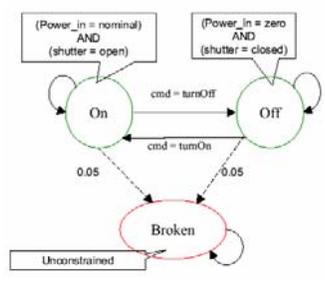






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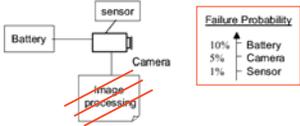
Vision-based Navigation Scenario



4

Vision-based Navigation Scenario



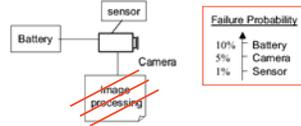


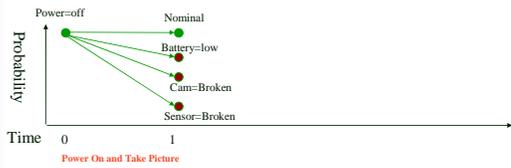


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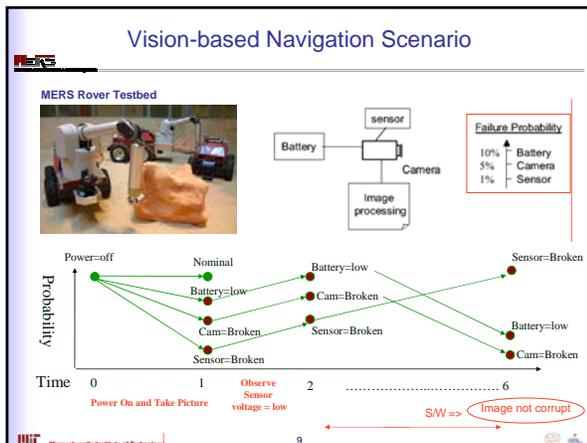
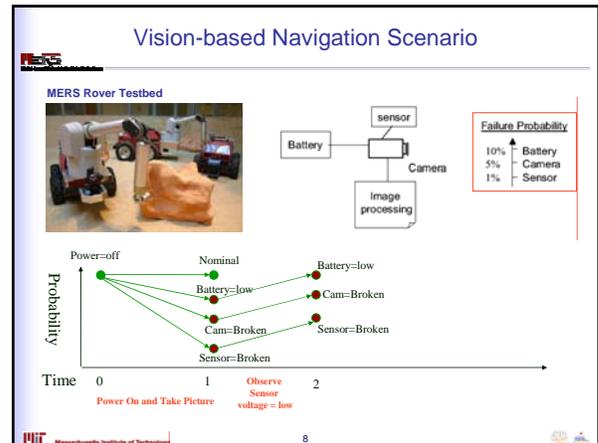
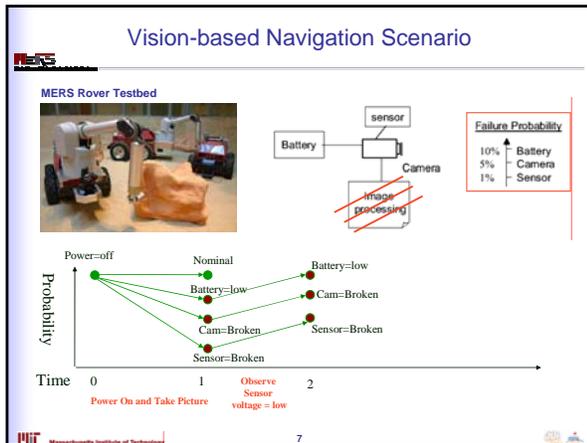
Vision-based Navigation Scenario







6



Problem and Challenges

Problem:
 Given observations, commands, and behavior models:
 Track the most likely state trajectories of the software-extended system over time

Challenges:

1. Monitor hardware and software behavior
2. Delayed symptoms
3. Efficiency

