

# Synthesizing robots from specifications

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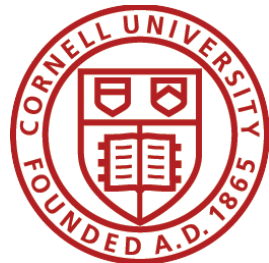
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# "incendiary idea"

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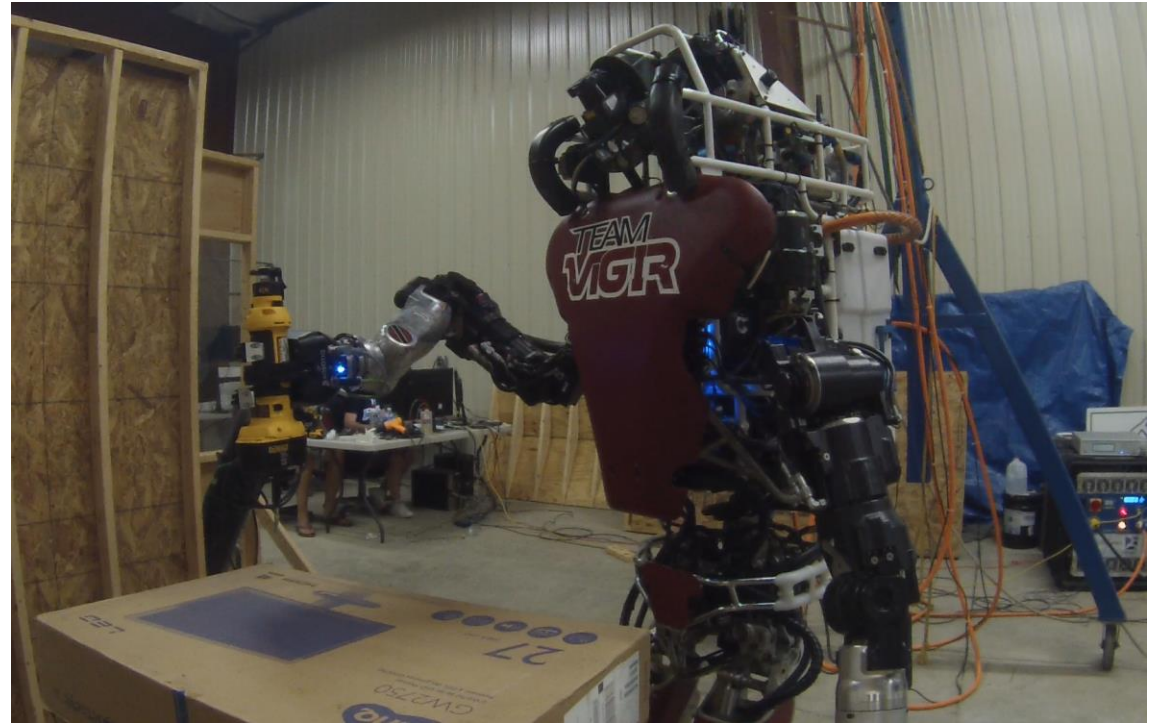
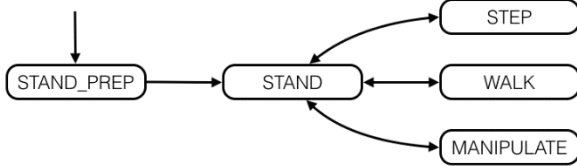
**Absolutely model things! Then build robots**

# "incendiary idea"

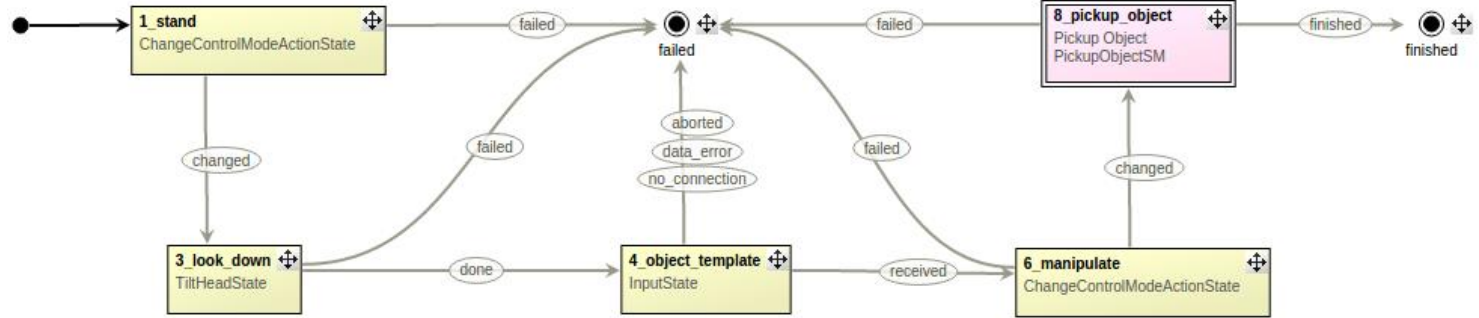
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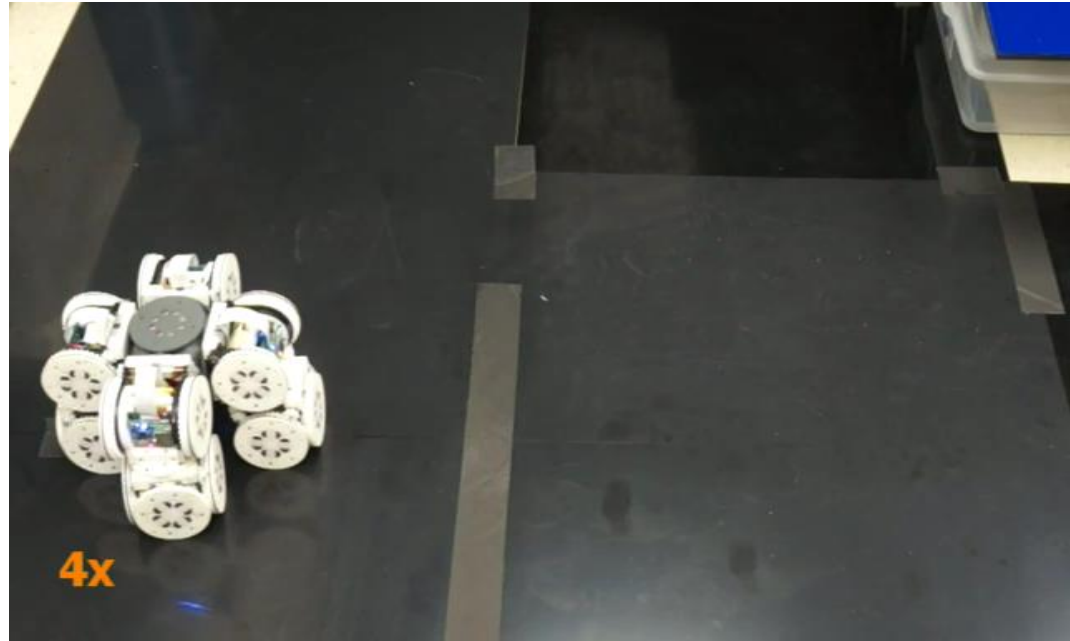
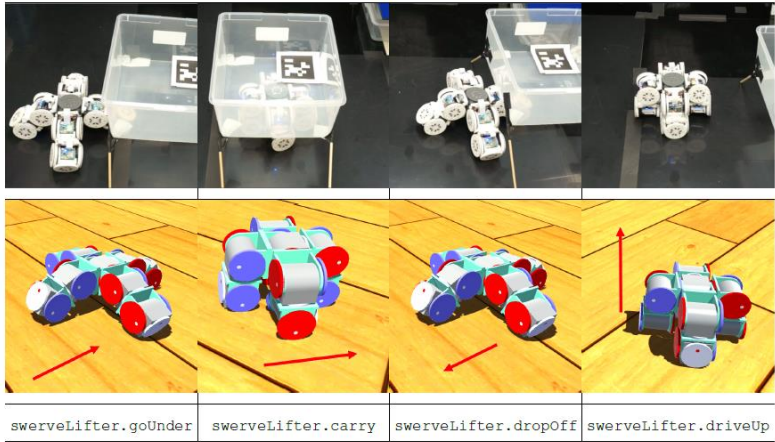
## **Absolutely model things! Then build robots**

- Library of components
- Language(s) to describe assumptions and guarantees
- Composition and refinement operations



Synthesis Demo (root) > stand\_and\_pick





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robot starts with false

# Follow the path to get to the object and to move with the object
followPath is set on (not atObject_d and (not secureObject_md or
releaseObject_md)) or (secureObject_md and not atGoal_du) and reset on
(atObject_d and releaseObject_md) or (atGoal_du and releaseObject_md)

# Follow the path
do leftForward_md if and only if (not onPath_d) and followPath
do rightForward_md if and only if onPath_d and followPath

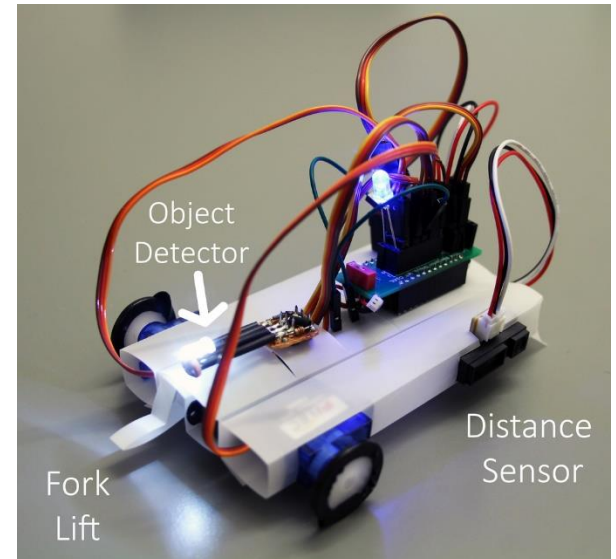
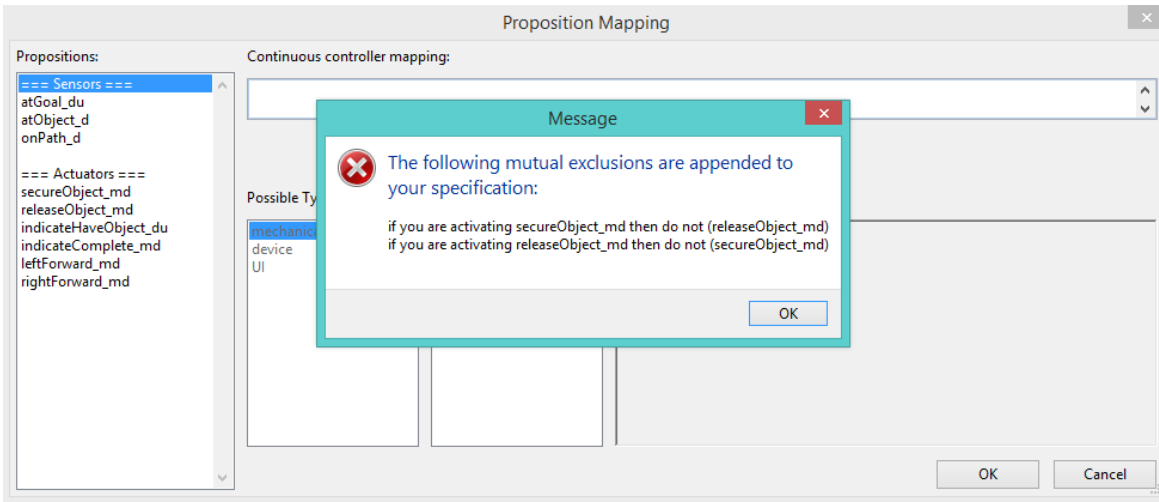
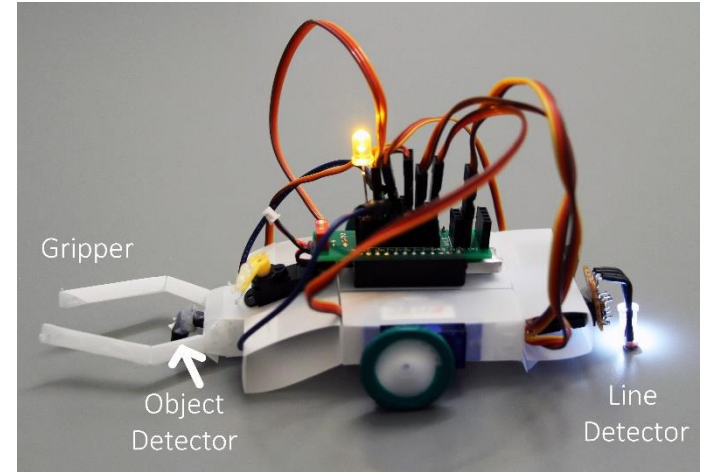
# Grasp object when reached and release it when at goal
do secureObject_md if and only if (atObject_d or secureObject_md) and
not atGoal_du
do releaseObject_md if and only if atGoal_du

# Indicate when object is grasped
do indicateHaveObject_du if and only if secureObject_md

# Indicate when task is complete
do indicateComplete_md if and only if (atGoal_du and releaseObject_md)

if you are activating secureObject_md then do not (releaseObject_md)
if you are activating releaseObject_md then do not (secureObject_md)

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