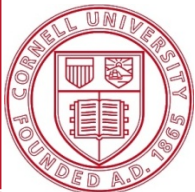


LTL for multiple agents

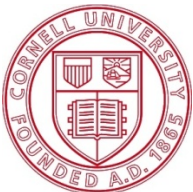
Hadas Kress-Gazit
Cornell University



November 4th, 2010

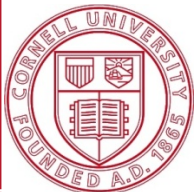
2 paradigms

- Centralized:
 - one controller for a group of robots
 - Need to have full information
- Decentralized:
 - One controller for each robot
 - Little information about other robots



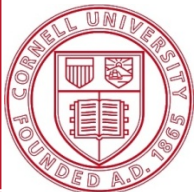
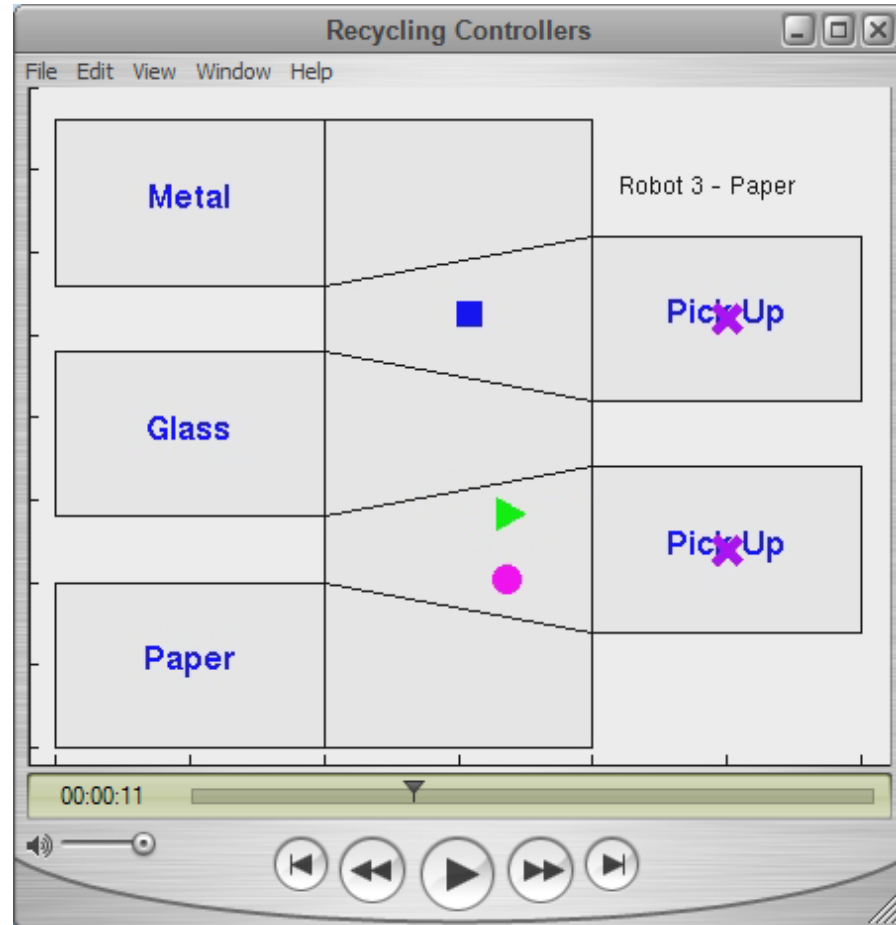
Centralized

- One LTL formula and one automaton for the whole group
 - Can maintain communication range
 - Global guarantees: no collisions, no deadlock
 - State space grows exponentially with the number of robots



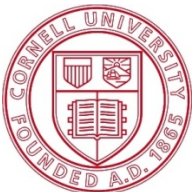
Example

“Pick up items and take them to the appropriate room based on the material”



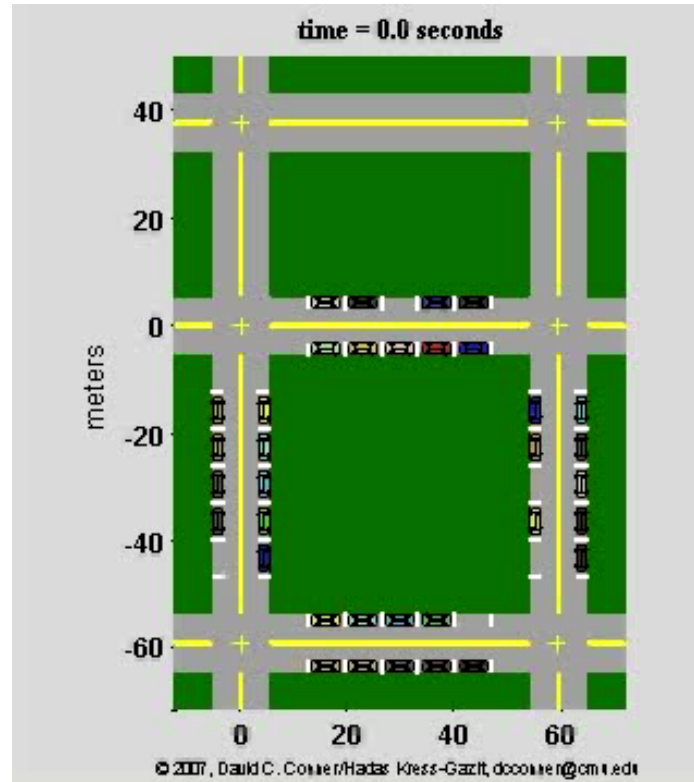
Decentralized

- One LTL formula and one automaton for **each robot**
 - Other robots are part of the environment
 - Scales well*
 - No global guarantees

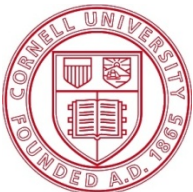


Example

“Drive around while obeying traffic rules until you find a free parking space, and then park”

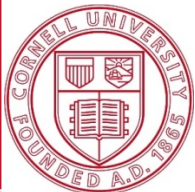


“Leave the block, while obeying traffic rules, through Exit_i”



Challenges / future work

- Have the planning and control foundation
- Challenges / future work
 - Task-based group decomposition
 - Information passing between groups
 - Global guarantees
 - Scalability



Thank you

