

# Recitation #9

**18-649 Embedded System Engineering**

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**Friday 10/25/2013**



Note: Course slides shamelessly stolen from lecture  
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**Carnegie  
Mellon**

# Announcements and Administrative Stuff

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- ◆ **Project 9 is due Thursday Oct. 30<sup>st</sup> by 10pm.**
- ◆ **Presentation slides due 5pm 10/25/2014 (Saturday) via email!!!**
- ◆ **Important Grading Note: The grading script REQUIRES correctly formatted files. (e.g unit\_tests.txt, integration\_tests.txt etc)**
- ◆ **Hand in ALL the files needed to run your tests.**
- ◆ **New TAs!**
  - hopefully you knew this, cause it's a bit late if you didn't

# Project 9

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- ◆ **Pick up where you left off on Project 8**
- ◆ **Finish designing smart dispatcher (and Doors)**
  - Statecharts
  - Unit tests
  - Implementation
  - Traceability
  - Peer reviews:
    - Dispatcher & DoorControl statechart
    - Dispatcher & DoorControl implementation
    - Dispatcher & DoorControl unit tests

# New Requirements

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- ◆ **R-T6: The Car shall only stop at Floors for which there are pending calls.**
- ◆ **R-T7: The Car shall only open Doors at Hallways for which there are pending calls.**
- ◆ **R-T8: The Car Lanterns shall be use in a way that does not confuse passengers.**
  - **R-T8.1:** If any door is open at a hallway and there are any pending calls at any other floor(s), a Car Lantern shall turn on.
  - **R-T8.2:** If one of the car lanterns is lit, the direction indicated shall not change while the doors are open.
  - **R-T8.3:** If one of the car lanterns is lit, the car shall service any calls in that direction first.
- ◆ **R-T9: The Drive shall be commanded to fast speed to the maximum degree practicable.**
- ◆ **R-T10: For each stop at a floor, at least one door reversal shall have occurred before the doors are commanded to nudge**

# Only Service Landings with Pending Calls

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- ◆ **Elevator must only stop at floors/hallways that need to be serviced**
- ◆ **DesiredFloor**
  - Floor – the floor we intend to go to next
  - Direction – the direction we intend to go **after** we reach the desired Floor
  - Hallway – which doors should open

# Only Service Landings with Pending Calls

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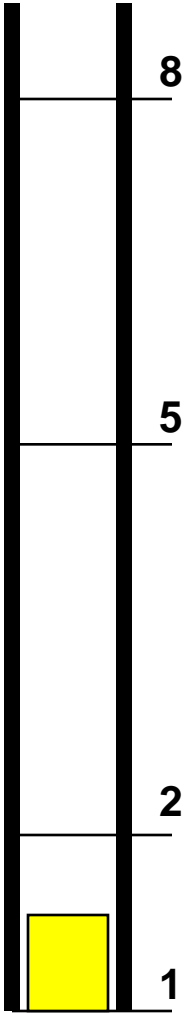
- ◆ **Update desired floor/direction based on current state of hall/car calls**
  - When is it OK to update these?
- ◆ **For example:**
  - If the elevator is stopped and opening its doors  
AND there is no pending call at the current floor  
AND there is a pending call at another floor  
THEN:
    - DesiredFloor.Floor must NOT BE current floor by the time the doors are fully open
    - DesiredFloor.Direction must correspond to illuminated lantern direction
- ◆ **What about between floors?**
- ◆ **When should you NOT update these values?**
- ◆ **Above example is not a hard requirement**
- ◆ **Follow the requirements and do what makes sense for your design**

# Example

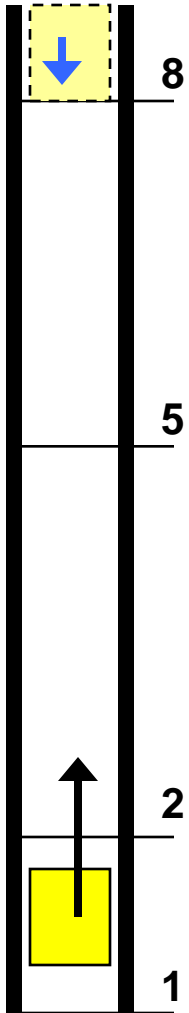
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◆ **Suppose car is initially at floor 1 and stopped**

- No calls
- Desired Floor = (1, stop)



# Example

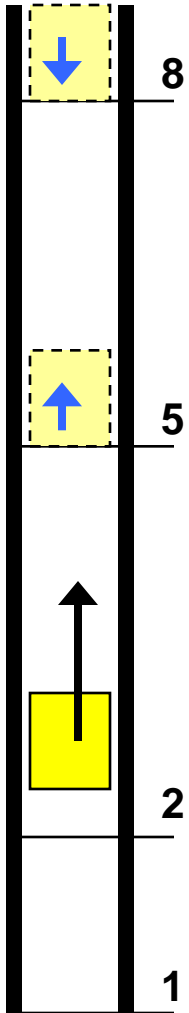


## ◆ Get a hall call for (8, down)

- Car begins moving up
  - Current direction = **Up**
- DesiredFloor.floor = 8
- DesiredFloor.direction = **Down**
  - **Where we're going after servicing floor 8**



# Example



- ◆ **Get a hall call for (8, down)**
- ◆ **Then receive a hall call for (5, up)**
  - Dispatcher decides to service floor 5 first
    - Depends on your algorithm
  - Current direction remains Up
  - DesiredFloor.floor = 5
  - DesiredFloor.direction = **Up**
    - **Where we're going after we service floor 5**
- ◆ **How do you decide where to go next?**
  - Based on current set of car/hall calls
  - Anything that meets the requirements is OK
    - Example: Sweeping up and down servicing calls in the current direction first

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**Yada-yada-yada...**

**SODA MACHINE EXAMPLE!**

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**Questions?**