Recitation #10

18-649 Distributed Embedded Systems

Friday 6-Nov-2015

Electrical & Computer
ENGINEERING

Carnegie
Mellon

Announcements and Administrative Stuff

◆ **Project 9 was due last night**

◆ **Project 10 has already been posted**

- Due Thursday November 12

◆ **Monday Office Hours**

- 4:30-5:30 BH 237B

- Move to Tuesday?

Modifying Network Interface

◆ **You may make** *one and only one* **of the following modifications to the input interface:**

1. Add mCarPositionIndicator to the input of the Dispatcher and Drive Control, OR

2. Add mDriveSpeed and mCarLevelPosition to the input of the Dispatcher.

◆ **Other modifications can be made with approval from a TA**

◆ **This is to avoid turning one controller into a brain node:**

• Adding an input to Dispatcher to make it smarter is acceptable

• Adding an output to Dispatcher so it can control the doors is not

Lessons your classmates learned (so you don't have to)

◆ **Peer reviews caught at least 70% of bugs for almost every group**

◆ **Check your handin**

◆ **Use version control**
- Commit early, commit often

◆ **Write scripts for testing**
- Don't blindly trust scripts

More Lessons

◆ **Have an emergency sequence diagram to trace everything**

◆ **Bugs aren't necessarily in the module that looks like it's misbehaving**

  • Dispatcher bug causes doors not to open

◆ **Single states with multiple values are likely to cause problems**

  • Leveling state

◆ **The TAs are not obliged to run your tests manually if these scripts do not work.**

Float Comparisons in the testbench

- **Comparisons of floats are awful**
  - Especially when things gets cast back and forth to doubles

- **Possibilities**
  - Use bounds. The test bench supports <= and >=
  - Use integer messages (e.g.multiply by 100)

Project 10

◆ **Finish what you started in project 9**

- Pass your unit tests for Dispatcher and Door Control

◆ **Finish designing and implementing DriveControl (and anything else you haven't implemented)**

- StateCharts

- Unit tests

- Implementation

- Traceability

- Peer reviews:
  – DriveControl statechart
  – DriveControl implementation
  – DriveControl unit tests

◆ **Add a monitor for RT-10**

Monitored Requirements

◆ **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 used 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 cars 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.**

Driving Fast

- **Fast speed is 5 m/s**
  - Set this with the –fs 5.0 flag

- **Remember the speed transmission constraint table:**

	Drive Speed Values						
Drive Command Values	FastSpeed >= DriveSpeed >= SlowSpeed, UP	SlowSpeed >= DriveSpeed > LevelSpeed, UP	LevelSpeed >= DriveSpeed > 0, UP	DriveSpeed == 0,STOP	LevelSpeed >= DriveSpeed > 0, DOWN	SlowSpeed >= DriveSpeed > 0, DOWN	FastSpeed >= DriveSpeed >= SlowSpeed, DOWN
Fast, Up	X						
Slow, Up	X	X	X	X			
Level, Up		X	X	X			
Stop, Stop			X	X	X		
Level, Down				X	X	X	
Slow, Down				X	X	X	X
Fast, Down							X

Questions?