Recitation #10

18-649 Embedded System Engineering
Friday 10/31/2014
Announcements and Administrative Stuff

◆ Project 10 is due Thursday Nov 6th by 10pm.

◆ 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.
Lessons your classmates learned (so you don’t have to)

- Peer reviews caught at least 70% of the bugs for almost every group

- Check your handin

- Use version control
  - Commit early, commit often

- Write scripts for testing
  - Cron is pretty awesome
  - Don’t blindly trust your scripts
More Lessons

◆ Have an emergency Sequence diagram to trace all than nonsense

◆ Bugs aren’t necessarily in the module that looks like it’s misbehaving
  • Dispatcher bug causes doors not to open.

◆ Single states with multiple possible output values are likely to cause problems
  • Leveling state
Float comparisons in the testbench

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

- **Possibilities**
  - Use bounds. The test bench supports <= and >=
  - Use integer messages (e.g. multiply by 1000)
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 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
## Driving Fast

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

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

<table>
<thead>
<tr>
<th>Drive Command Values</th>
<th>Drive Speed Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast, Up</td>
<td>FastSpeed &gt;= SlowSpeed, UP</td>
</tr>
<tr>
<td>Slow, Up</td>
<td>SlowSpeed &gt;= DriveSpeed &gt; 0, UP</td>
</tr>
<tr>
<td>Level, Up</td>
<td>LevelSpeed &gt;= DriveSpeed &gt; 0, UP</td>
</tr>
<tr>
<td>Stop, Stop</td>
<td>DriveSpeed == 0, STOP</td>
</tr>
<tr>
<td>Level, Down</td>
<td>LevelSpeed &gt;= DriveSpeed &gt; 0, DOWN</td>
</tr>
<tr>
<td>Slow, Down</td>
<td>SlowSpeed &gt;= DriveSpeed &gt; 0, DOWN</td>
</tr>
<tr>
<td>Fast, Down</td>
<td>FastSpeed &gt;= SlowSpeed, DOWN</td>
</tr>
</tbody>
</table>
Questions?